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Executive Summary

The Brunei Institute of Technical Education (IBTE) Guide to Assessment has been prepared to facilitate the transformation of technical and vocational education and training in Brunei Darussalam towards competency-based education and training approach. The Guide will provide help in the design and review of valid and reliable assessments to enhance students'/trainees' learning experience. This Guide aimed primarily at instructors, trainers, curriculum specialists, supervisors and others involved in job-related training programmes for Industrial Skills Qualification (ISQ), National Technical Education Certificate (NTec) and Higher National Technical Education Certificate (HNTec) qualifications. The Guide is also aimed to promote principles of consistency of practice; coherent programme assessment structure and sustainable assessment.

A Teacher Satisfaction survey was conducted recently by the Quality Management Division under IBTE to measure the teacher satisfaction level on module delivery. The survey was carried out between 20th may till 17th June 2017 administered to all teaching staff at IBTE. The results of this survey were published internally and among other matters highlighted, there was a common call among the respondents in which a clear guideline on competency-based assessment is urgently needed. Consequently, a preparation to develop this IBTE Guide to Assessment kick started.

The IBTE Guide to Assessment has been prepared and arranged into five (5) main sections namely Section 1: General Information; Section 2: Competency-based Assessment; Section 3: Internal Verification and Section 4: External Moderation / Skill Auditing and Section 5: Glossary of Terms. The complete proposed IBTE Guide to Assessment is attached at the end of this policy paper.

Objective

The main objective of this study is to collect data concerning the current Competency-based Assessment practices at IBTE through its transformation in technical and vocational education. Based on the data collected it would help to facilitate the development of assessment policy at IBTE. The availability of assessment policy will provide help primarily at teaching staff in the design and review of valid and reliable assessments to enhance students learning experience.

Introduction

A competency is a general statement that describes the ability to apply or use a set of desired and related knowledge, skills, and attitudes required to successfully perform "critical work functions" or tasks in a defined work setting. Competencies often serve as the basis for skill standards that specify the level of knowledge, skills, and attitudes required for success in the workplace as well as potential measurement criteria for assessing competency attainment. Competencies are relevant to an individual's job responsibilities, roles, and capabilities. They are a way to verify that a learner/trainee has in fact learned what was intended in the learning objectives.

Competency-based Education and Training (CBET) is an approach geared to the attainment and demonstration of knowledge, skills, and attitudes to meet industry-specified standards rather than an individual's achievement relative to others in a group. Through the transformation of technical and vocational education and training in Brunei Darussalam lead by IBTE, competency-based education and training approach has been the ultimate desire to be achieved. The TVET system which is contributing to national development has also been designed as a "Demand Driven System".

The IBTE through its transformation in technical and vocational education and training has embarked in reviewing and redesigning their curriculum with emphasis on 70% practical and 30% theory. In addition, modular-based design curriculum has also been implemented in order to allow for flexibility as small modules can easily be changed, abolished or developed in accordance with the perceived needs. Among other things, the basis for designing CBET curricula are the integration of competency standards with their different components of competency, evidence of performance, performance criteria, filed of application and assessment guidelines. Once the competency has been described and standardized for each job/occupation, the design of Competency Development Framework (CDF) for a particular job/occupation could be much more efficient and oriented towards the standard. If the teaching/training is geared to generate modularized competencies that clearly correspond to existing standards, it will much more efficient and will have a stronger impact than teaching/training that is totally unaware of the needs of the entrepreneurial sector.

On the 27th March 2017, the author was seconded from BDTVEC Secretariat to assist the Quality Management Department under IBTE twice a week. On the 28th December 2017, the author was officially appointed as a member of IBTE Academic Council. During my

secondment at Quality management Division (QMD), I was assigned as an Academic Quality Coordinator. I was informed that many staff were facing difficulties with assessments. There seemed to be inconsistency in the implementation of assessment procedures. In order to gain some insight into the current issues, a Teacher Satisfaction survey was conducted by the QMD under IBTE, to measure the teacher satisfaction level on module delivery at IBTE. The author had prepared the questionnaire and divided into four (4) main areas of concerned namely (i) Content & Organisation; (ii) Teaching Preparation; (iii) Teaching & Learning Resources and (iv) Assessment Quality and Student Performance. The findings of this survey have provided some basis and way forwards for further improvement on the transformation of TVET in Brunei Darussalam.

Methodology

A questionnaire comprising of forty five (45) questions were developed. The draft of the questionnaire was distributed to some Divisional Directors under IBTE for comments. It was also verified by an expert from SEAMEO VOCTECH. The survey was finally conducted via http://www.ibte.edu.bn/campus with the cooperation of Research and Statistics Division and Information technology Services Division under the IBTE. Please refer to Appendix 1 for the said questionnaire. The survey was conducted from 20th May 2017 until 17th June 2017.

In the interpretation of the quantitative data, three (3) benchmarks were adopted to differentiate the severity of each question as follows:

% of Respondents Satisfied	Description of Severity
80% - 100%	Comfortable and can be improved where necessary
60% - 79%	Keep in view and improvement may be needed
< 60%	Immediate action is needed

Survey Findings

A total of two hundred and sixty five (265) respondents (71.4%) received from nine (9) Schools under IBTE namely Agro-technology & Applied Science (AAS), Aviation (AVI), Brunei Maritime Academy (BMA), Building Technology Service (BTS), Business (BUS), Energy & Engineering (Central) (EEC), Energy & Engineering (Satellite)(EES), Hospitality & Tourism (HNT) and Information & Communication Technology (ICT). There are two (2) forms of data collected namely quantitative data and qualitative data. The data were compiled and analysed. In this paper, the author will only present the quantitative and qualitative data related to Assessment and Student Performance as per the questionnaire.

The quantitative data was illustrated in Table 1. There were several data results that had to be taken into consideration. Respondents were generally i) satisfied with their familiarity with the assessment policy and CBA (86.94%); ii) the relevance of the assessment methods set out in Module Guide (86.24%); grading system and percentage pass rate (87.49%); and iii) how the student's assessment results were used to help improve their learning (88.72%). On the other hand, there were also some data recorded that requires moderate attention (data between 60%-79%) or immediate action (<60%). Firstly, where data results showed satisfactory results of whether respondents were satisfied with how CBA was applied in their module, it was recorded a high 82.2%, however, in this category there were some Schools whose data results required consideration – AVI (64.70%) and BMA (61.50%). Secondly, data results in the 70th percentile included categories of whether respondents were i) satisfied with the support and guidance provided in preparing the marking scheme for assessments (72.44%); ii) the internal verification process was easy to implement (73.65%); and iii) the assessment was reliable to give consistent results that reflect the capabilities of the students (78.25%). For the first category, the highest data percentage recorded was from BMA (84.6%), and the lowest was from ICT (62.9%). Subsequently, for the remaining two categories, BMA recorded 92.30% compared to 57.10% from ICT and for the latter, BMA's data was the highest with 92.30% and ICT with the lowest 62.90%. The feedbacks from BMA for the above three (3) categories were generally high because the programmes in BMA were adopting the teaching materials and assessment package from Singapore Polytechnic's. They have to comply with the Quality in Maritime Education and Training (QMET) Framework.

Onto data results in the 60th percentile, these included categories of whether respondents were i) satisfied with the support and guidance provided in preparing the marking rubric for

assessments (67.43%); ii) there was sufficient time to prepare for assessment (64.69%); and iii) there was sufficient time to assess student's work (65.57%). For the first category in this percentile, BMA recorded the highest with 76.9% and BTS was the lowest with 58.3%. For the second and third categories, BMA results were recorded the highest with 84.60% and 92.30% and AVI the lowest with 52.90% and 47.10% respectively.

Consequently onto data results in the 50th percentile, categories included the agreement of respondents on whether i) the external verification process is easy to implement (52.61%); and ii) respondents encountered many plagiarisms in student's assessments (51.16%). With regards to the first category, BMA's agreement to the specified statement was also recorded as the highest – 69.20%, and BTS with the lowest – 37.50%. Onto plagiarism, EEC data results recorded the highest percentage of plagiarism (66.70%) whereas AVI results recorded the lowest of 41.20%.

Lastly, onto the only category in the 40th percentile; that was whether respondents were satisfied with the overall process of the CBA. BMA results held the highest satisfactory percentage of 53.80% whereas ICT showed a general satisfaction of 37.10%.

Overall, BMA could be concluded generally as the School whereby the assessment was carried out well. However only 67.43% was satisfied with the support and guidance provided in preparing the marking rubrics for assessments and 72.44% was satisfied with the support and guidance provided in preparing the marking scheme for assessments. On average, 63.13% of the respondents was satisfied with the ease of implementing current verification (internal and external) process. Overall only 45.93% of the respondents was satisfied with the process of Competency-based Assessment (CBA).

Table 1: Percentage (%) of Respondents in Assessment and Student Performance (Quantitative Data)

Assessment and Student Performance Questions		Average (%)	By Schools (%)								
			AVI	BTS	BUS	EEC	HNT	ICT	BMA	AAS	EES
1.	I am familiar with the assessment policy set out in the IBTE Academic Policy, Procedures and Guidelines.	89.16%	82.40%	79.20%	86.70%	89.60%	90.90%	82.90%	100.00%	95.20%	95.70%
2.	I am familiar with Competency-Based Assessment (CBA).	84.71%	70.60%	95.80%	88.90%	87.50%	81.80%	82.90%	84.60%	83.30%	87.00%
3.	I can apply CBA in my taught Module.	82.20%	64.70%	95.80%	84.40%	87.50%	86.40%	80.00%	61.50%	88.10%	91.30%
4.	I am satisfied with the support and guidance provided in preparing the marking rubric for assessments.	67.43%	70.60%	58.30%	66.70%	68.80%	68.20%	65.70%	76.90%	64.30%	67.40%
5.	I am satisfied with the support and guidance provided in preparing the marking scheme for assessments.	72.44%	76.50%	70.80%	66.70%	75.00%	72.70%	62.90%	84.60%	66.70%	76.10%
6.	I have sufficient time to prepare for the assessment.	64.69%	52.90%	58.30%	55.60%	72.90%	59.10%	60.00%	92.30%	57.10%	73.90%
7.	I have sufficient time to assess students' work.	65.57%	47.10%	62.50%	57.80%	77.10%	68.20%	54.30%	84.60%	69.00%	69.60%
8.	The internal verification process is easy to implement.	73.65%	70.60%	66.70%	68.90%	72.90%	81.80%	57.10%	92.30%	78.60%	73.90%
9.	The external verification process (to CBA team) is easy to implement.	52.61%	52.90%	37.50%	40.00%	60.40%	54.50%	40.00%	69.20%	66.70%	52.20%
10.	I am satisfied with the overall process of CBA.	45.93%	41.20%	45.80%	37.80%	56.30%	45.50%	37.10%	53.80%	52.40%	43.50%

Table 1: Percentage (%) of Respondents in Assessment and Student Performance (Quantitative Data)

11.	The assessment methods (types of assessment) set out in the Module Guide are appropriate to the intended learning outcomes.	86.24%	82.40%	79.20%	88.90%	83.30%	81.80%	71.40%	100.00%	100.00%	89.10%
12.	The assessment scheme (weighting) sets out in the Module Guide is appropriate to the intended learning outcomes.	86.88%	88.20%	83.30%	93.30%	79.20%	81.80%	77.10%	92.30%	95.20%	91.30%
13.	The assessment is reliable to give consistent results that reflect the capabilities of the students.	78.25%	76.50%	79.20%	77.80%	79.20%	72.70%	62.90%	92.30%	83.30%	80.40%
14.	The percentage pass rate is satisfactory (e.g. was the pass mark adjusted?)	88.80%	100.00%	83.30%	86.70%	87.50%	90.90%	74.30%	92.30%	92.90%	91.30%
15.	The grading system (A*, A, B, C, D, F) is suitable to reflect the competency level of the students.	86.17%	88.20%	79.20%	93.30%	83.30%	95.50%	71.40%	92.30%	81.00%	91.30%
16.	The overall level of performance of students in term of Grade is satisfactory for the module taught.	89.16%	88.20%	87.50%	86.70%	91.70%	90.90%	74.30%	92.30%	95.20%	95.70%
17.	The assessment results (from coursework, laboratory work, etc.) are used well to help students improve their learning.	88.72%	88.20%	83.30%	86.70%	91.70%	90.90%	80.00%	100.00%	92.90%	84.80%
18.	I encounter many plagiarisms in students' assessments.	51.16%	41.20%	45.80%	64.40%	66.70%	54.50%	48.60%	46.20%	45.20%	47.80%

Under the qualitative data as shown in Table 2: Number of Occurrence for Each Type of Feedbacks, the feedbacks were categorised into four (4) major management teams for further action. The management teams concerned are i) Curriculum, Planning and Development; ii) CBET; iii) Human Resource Development and iv) Head of School and Campus. The top ten suggestions from the respondents were as follows:

Ranking	Suggestions	Number of Respondents
1	Improve facilities and resources / Proper facilities / Better maintenance	126 (47.55%)
2	Clear guideline on CBA / Improve CBA procedure	97 (36.60%)
3	Improve Programme Guide	83 (31.32%)
4	Close skill gaps / Quality teaching staff / Peer coaching / Professional learning community	64 (24.15%)
5	More time for teaching/preparation/ assessments	51 (19.25%)
6	Improve teaching methods / Sufficient teaching materials / Sufficient learning aids	37 (13.96%)
7	Less administration duty	32 (12.08%)
8	More industrial exposure / More site visits for students / Invite Speakers	28 (10.57%)
9	More collaboration with industries	21 (7.92%)
10	Standardised and share notes and references	18 (6.79%)

Table 2: Number of Occurrences for Each Type of Feedbacks (Quanlitative Data)

	Curriculum		CBET		HRD	HOS & Campus								
	Improve Programme Guides	More support and guidance for using PG and MG	Clear guideline on CBA / Improve CBA procedure	CBA Verification to be done by subject expert	More staff needed (instructors/TA)	Improve facilities and resources / Proper facilities / Better maintenance	Close skill gaps / Quality teaching staff / Peer Coaching /Professional Learning Community	Improve teaching methods / Sufficient teaching materials / Sufficient learning aids	More time for teaching/preparation/assessments	Less administration duty	More collaboration with industries	More industrial exposure/more site visits for students / Invite speakers	Standardised and sharing notes and references	Timetable to be given on time
School of Aviation														
H/ERE		1				1	1	2		1				
H/TCS		1		1		2	2				4			
H/EMT			1			1	1						1	
H/AME		1				1		1	1		2			
Total	0	3	1	1	0	5	4	3	1	1	6	0	1	0
School of Building Technology Services														
H/CTN	2		2			6	1	3		1	1			
H/DDG						1	2			1				
N/BCF	4		1		1/1	2	1							
D/PND		2	2				1	2			2			
Total	6	2	5	0	0	9	5	5	0	2	3	0	0	0

Table 2: Number of Occurrences for Each Type of Feedbacks (Quanlitative Data)

School of Business														
H/BNF	8		8		1	11		1	5	4				1
H/OAD	1		1											1
N/BNA	7		3		1	6		1	3	2		2		
Total	16	0	12	0	2	17	0	2	8	6	0	2	0	2
School of Energy and Engineering Central														
H/AUT	1		2			8	3			1	2		3	
H/ELE	3		2			5	1		4	1				
N/HVM			3			3	1				2			
N/LVM	3		6			3	2				1			
ISQ	4					3	6		1	1	1		2	
Total	11	0	13	0	0	22	13	0	5	3	6	0	5	0
School of Hospitality and Tourism														
H/HOS						2		1	1			1		
H/TRV	5		2			3	1	2	2			3		
N/CUL	1		1			2	2	1	1	1				
Total	6	0	3	0	0	7	3	4	4	1	0	4	0	0
School of Information and Communication Technology														
H/ITN	8	1	9		1/1	6	3	6	5	5			1	
H/CNW			1				1					1	1	
H/LBS			1			1	1						1	
N/ITN	1		1				1						1	
Total	9	1	12	0	0	7	6	6	5	5	0	1	4	0
Brunei Maritime Academy														
BMA	4				1	6	3	2	1	2		4		
Total	4	0	0	0	1	6	3	2	1	2	0	4	0	0

Table 2: Number of Occurrences for Each Type of Feedbacks (Quanlitative Data)

School of Agro-technology and Applied Sciences														
H/AGT	4		7			13	8	5	3			3		
H/LSC	1		5			1		4	2	3		3		
H/PHT	1		2			3		1	2	1		1		
N/AQU	1		1			2	1	1				1		
N/CLP	1					3	1							
N/FPR	2		1			1	1		2			1		
Total	10	0	16	0	0	23	11	11	9	4	0	9	0	0
School of Energy and Engineering Satellite														
H/ICE	4		10			6	6		2	4	2	3	4	
H/PLE	4		9			6	7		2	2	2	1		
H/BSE	6		4			4	4	2	3	1	2	2		
H/MEC	2		2		1	3			2			2	1	
N/RAC	2	1	2						1					
N/AIM			1						1					
N/IEM	1		2			7			2				1	
N/MCH	2		2			1		2	4	1				
N/WLD			3			3	2		1				2	
Total	21	1	35	0	1	30	19	4	18	8	6	8	8	0
Grand Total	**83**	**7**	**97**	**1**	**4**	**126**	**64**	**37**	**51**	**32**	**21**	**28**	**18**	**2**

Based on the quantitative and qualitative data as described above, it was obvious that a consolidated assessment policy is urgently needed in order to support and facilitate teaching staff in implementing Competency-based Assessment system. No doubt, improvement on curricula based on Competency-based Education and Training (CBET) approach and improvement on facilities/resources are also needed to support each other.

Conclusions and Recommendations

Based on the data collected, the author has developed the IBTE Guide to Assessment with assistance from staff members at QMD and IBTE Network of School (Central) . The Guide was completed in June 2018 and was submitted to IBTE Academic Council for endorsement. The IBTE Guide to Assessment is divided into five (5) sections namely Section 1: General Information; Section 2: Competency-based Assessment; Section 3: Internal Verification and Section 4: External Moderation / Skill Auditing and Section 5: Glossary of Terms. The complete Guide is attached at the end of this policy paper for reference.

The IBTE Guide to Assessment will provide help primarily at instructors and trainers to use in the design and review of valid and reliable assessments to enhance students'/trainees' learning experience. By using the Guide, it will also help to promote principles of consistency of practice; coherent programme assessment structure and sustainable assessment. This is in line with the quality assessment as one of the academic domains for IBTE Academic Quality Assurance Framework. The Guide should be treated as a living document and is designed with some flexibility. It is readily adapted by staff to accommodate reasonable adjustments (where necessary). Further improvement on this Guide is encouraged after one year of implementation.

Finally, the author would like to recommend that the Programme Guides developed by IBTE should be reviewed in order to incorporate CBET approach in curriculum development. In addition, each programme should be based on learning outcomes that emphasise student-centered learning and student competencies which are in line with the respective descriptors of IBTE Level Qualification (ISQ, NTec and HNtec). This would be a way forward to integrate and harmonize with the Brunei Darussalam Qualification Framework (BDQF) and as a result, the ASEAN Quality Assurance Framework as a whole.

Academic Implementation Survey for Teachers

The objective of this survey is to evaluate the module delivery of Competency-Based Education and Training (CBET) in IBTE institutions. The outcomes of the survey will provide opportunities and follow-up actions for further improvement of Technical and Vocational Education and Training (TVET) in Brunei Darussalam.

<table>
<tr><td rowspan="4">Campus</td><td colspan="2">1)</td><td rowspan="4">Programme Taught</td><td colspan="6">1)</td></tr>
<tr><td colspan="2">2)</td><td colspan="6">2)</td></tr>
<tr><td colspan="2">3)</td><td colspan="6">3)</td></tr>
<tr><td colspan="2">4)</td><td colspan="6">4)</td></tr>
<tr><td rowspan="4">School</td><td colspan="2">1)</td><td rowspan="4">Module Taught</td><td colspan="6">1)</td></tr>
<tr><td colspan="2">2)</td><td colspan="6">2)</td></tr>
<tr><td colspan="2">3)</td><td colspan="6">3)</td></tr>
<tr><td colspan="2">4)</td><td colspan="6">4)</td></tr>
<tr><td>Gender
(please circle)</td><td>Male</td><td>Female</td><td>Age
(please circle)</td><td>21 - 25</td><td>26 - 30</td><td>31 - 35</td><td>36 - 40</td><td>41 - 45</td><td>Above 50</td></tr>
<tr><td>Date Joining IBTE</td><td colspan="2"></td><td>Survey Date</td><td colspan="6"></td></tr>
</table>

INSTRUCTION: Please circle SD (Strongly Disagree) , D (Disagree) , A (Agree) or SA (Strongly Agree) in the box next to the answer of your choice or write in the space provided if needed.

	Questions	Level of Satisfaction				Comments (if any)
	Content and Organisation					
1.	I am satisfied with the endorsed Module Guide overall (credit value, objectives, skills areas, assessment scheme, etc.).	SD	D	A	SA	
2.	I am satisfied with the support and guidance given in using the Module Guide.	SD	D	A	SA	
3.	The aims and objectives of the module are clear.	SD	D	A	SA	
4.	The aims and objectives of the module are reflective of the needs of industry and professional practice.	SD	D	A	SA	
5.	The selection of content in Module Guide clearly supports the learning objectives.	SD	D	A	SA	
6.	The sequencing of content in Module Guide clearly supports the learning objectives.	SD	D	A	SA	
7.	The content coverage is sufficiently practical for students to be able to use or see its usage in real workplace situations.	SD	D	A	SA	
	Teaching Preparation					
8.	I have been given sufficient time to prepare my teaching materials.	SD	D	A	SA	
9.	I am satisfied with the contact hours allocated to complete the module taught.	SD	D	A	SA	
10.	My overall teaching workload is reasonable.	SD	D	A	SA	Please specify your weekly teaching load hours:
11.	The administrative duties (if any) assigned to me are reasonable.	SD	D	A	SA	
12.	I am satisfied with the Competency- Based Assessment (CBA) training provided in order to implement the CBET system.	SD	D	A	SA	

	Questions	Level of Satisfaction				Comments (if any)
13.	My level of teaching competence is satisfactory.	SD	D	A	SA	
14.	I have adequate expertise (i.e. knowledge) to teach the module.	SD	D	A	SA	
15.	I have adequate practical experience to teach the module.	SD	D	A	SA	
16.	The teaching/learning methods used are appropriate to the intended learning outcomes.	SD	D	A	SA	
17.	I engage students in authentic tasks for practical lessons	SD	D	A	SA	
	Teaching and Learning Resources					
18.	The teaching/learning aids (module notes, power- point presentations, transparencies, video, etc.) are well-designed.	SD	D	A	SA	
19.	The teaching/learning resources (tools, workshop equipment, machine, etc.) are up-to-date.	SD	D	A	SA	
20.	The teaching/learning resources (tools, workshop equipment, machine, etc.) are appropriately focused on the learning objectives.	SD	D	A	SA	
21.	The teaching/learning resources (tools, workshop equipment, machine, etc.) are adequate in number.	SD	D	A	SA	
22.	The teaching/learning resources (tools, workshop equipment, machine, etc.) are adequate in accessibility to support learning.	SD	D	A	SA	
23.	The room layout supports interaction.	SD	D	A	SA	
24.	The room layout supports collaboration.	SD	D	A	SA	
25.	The laboratories allow for configuration of different work / problem scenario.	SD	D	A	SA	

	Questions	Level of Satisfaction				Comments (if any)
	Assessment Quality and Student Performance					
26.	I am familiar with the assessment policy set out in the IBTE Academic Policy, Procedures and Guidelines.	SD	D	A	SA	
27.	I am familiar with Competency-Based Assessment (CBA).	SD	D	A	SA	
28.	I can apply CBA in my taught Module.	SD	D	A	SA	
29.	I am satisfied with the support and guidance provided in preparing the marking rubric for assessments.	SD	D	A	SA	
30.	I am satisfied with the support and guidance provided in preparing the marking scheme for assessments.	SD	D	A	SA	
31.	I have sufficient time to prepare for the assessment.	SD	D	A	SA	
32.	I have sufficient time to assess students' work.	SD	D	A	SA	
33.	The internal verification process is easy to implement.	SD	D	A	SA	
34.	The external verification process (to CBA team) is easy to implement.	SD	D	A	SA	
35.	I am satisfied with the overall process of CBA.	SD	D	A	SA	
36.	The assessment methods (types of assessment) set out in the Module Guide are appropriate to the intended learning outcomes.	SD	D	A	SA	
37.	The assessment scheme (weighting) sets out in the Module Guide is appropriate to the intended learning outcomes.	SD	D	A	SA	
38.	The assessment is reliable to give consistent results that reflect the capabilities of the students.	SD	D	A	SA	
39.	The percentage pass rate is satisfactory (e.g. was the pass mark adjusted?)	SD	D	A	SA	

	Questions	Level of Satisfaction				Comments (if any)
40.	The grading system (A*, A, B, C, D, F) is suitable to reflect the competency level of the students.	SD	D	A	SA	
41.	The overall level of performance of students in term of Grade is satisfactory for the module taught.	SD	D	A	SA	
42.	The assessment results (from coursework, laboratory work, etc.) are used well to help students improve their learning.	SD	D	A	SA	
43.	I encounter many plagiarisms in students' assessments.	SD	D	A	SA	
44.	Recommend 3 areas on how the module you teach can be improved?					
	a.					
	b.					
	c.					
45.	Do you have any comments, questions or concerns?					

Thank You for Your Participation

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Preface

IBTE is Inspiring Bruneians Towards Excellence. It is a leading national institution in post-secondary education and training by producing highly skills and employable graduates that meet stakeholders' expectation through holistic learning environment.

This IBTE Guidelines to Assessment has been developed to provide help in developing assessments aimed primarily at instructors, trainers, curriculum specialists, supervisors, and others involved in job-related training programmes for ISQ, NTec and HNTec qualifications. It will help in the design and review of valid and reliable assessments to enhance students/trainees learning experience. It also aimed to promote principles of consistency of practice; coherent programme assessment structure; and sustainable assessment. This is a step forward in establishing Competency-based Education and Training approach in TVET.

QMD is grateful to the concerned officers of BDTVEC Secretariat, IBTE and SEAMEO VOCTECH for their involvement and contribution to this Guidelines.

1. General Information

Students/Trainees of IBTE programmes are internally assessed by Schools and subjected to moderation. Internal assessments are monitored to ensure that consistent and accurate standards are being applied and maintained. They are verified both internally as well as externally. Assessment verification aims to focus on validity and reliability of the assessments.

1.1 Offering a Programme

(i) The School will get an approval from IBTE Academic Council to run and offer any programme.

(ii) The School will arrange, provide and maintain all the machines, equipment, classrooms, ICT and Science laboratories, Software, workshops, tools, consumable items and human resources to run the programme to meet its requirements.

(iii) The School is expected to select appropriate specialised instructors in the teaching teams.

(iv) The instructors must be competent and must have the required competencies for the work they undertake, as well as evidence of how they maintain relevant industry experience.

(v) Head of School or Programme Leader will develop an appropriate timetable which will comply with the basic requirement of the contact hours for each module against the respective credit value.

(vi) The Head of School should ensure that assessment schedules are developed and provided to all staff and students concerned.

(iv) The Principal will appoint Examination and Assessment (EAC) Officer.

(v) The School or Campus will carry out the internal verification processes.

(vi) Head of School or Programme Leader / Module Leader will announce the list of Setter, Vetter and Internal Verifier for each programme.

(vii) Liaise with External Moderator or Skill Auditor (where applicable).

1.2 Assessment Benchmarks

(i) Endorsed IBTE Programme Guide (PG) forms the benchmarks for assessment. It is a detailed syllabus which acts as a guide for instructors/trainers and students. It comprises of relevant Module Guides (MGs) which organised into Skill Areas, Performance Objectives, Enabling Objectives and Performance Standards.

ii) Each PG is complete with relevant Competency Profile Chart (CPC). A CPC is a chart that displays the competencies in the programme (i.e. Job) which comprises of Skills Areas (i.e. Duty) and Competencies (i.e. Task).

iii) The Performance Objective (i.e. Task) represents a competency employers are willing to pay for. Workers are paid for what they can actually do on the job – producing a product, service, or decision.

(ii) Performance Standards which identify the minimum performance a student must demonstrate as evidence that he/she can perform a given Performance Objective. The Performance Standard will include the condition, performance and standard.

(iii) Underpinning knowledge and understanding (theory and/or concept) are merely *enablers* and are stated as Enabling Objective. They are prerequisites to or necessary backbones of all tasks or competencies.

(iv) Instructors must assess all the Performance Objectives contained in the Programme/Module Guide.

(v) Assessment Schemes within endorsed Programme/Module Guides provide the framework for assessment of the Skill Areas.

(vii) Instructors must be familiar with the full content of Programme/Module Guides against which they assess.

1.3 Validity

An assessment is valid when:

(i) it is appropriate for the purpose (e.g. practical skills are assessed through a practical assessment);

(ii) it allows students the opportunity to produce sufficient evidence required to satisfy the defined Performance Standards;

(iii) it facilitates reliable assessment decisions to be reached.

1.4 Reliability

An assessment decision is reliable when:

(i) it is based on evidence generated by valid assessments;

(ii) it is consistent across all assessors and all students undertaking the same assessment;

(iii) it is based on clearly defined performance criteria;

(iv) the conditions of assessment are applied consistently;

(v) it is consistent over time.

1.5 Assessment Materials

(i) It must comply with the relevant Assessment Scheme in Programme/Module Guides.

(ii) It provides holistic assessment, i.e. use a process which integrates knowledge and skills with their practical application in a workplace task.

(iii) It targets the correct qualification level.

(iv) It covers the relevant skill areas.

(v) It is able to be customised.

(vi) Instructors/Trainers must use the endorsed, valid and current Programme/ Module Guide when preparing assessment materials.

1.6 **Other principles** to be considered are:

(i) Practicability of assessment instrument: Assessments are practicable when they can be carried out efficiently and cost-effectively with the requisite resources.

(ii) Assessment should support student learning by the provision of appropriate feedback on student performance.

(iii) Flexibility of assessment: Students should be given the opportunity to negotiate certain aspects of their assessment, e.g. timing, with their assessor.

(iv) Assessment should be fair: Students should be assessed fairly in accordance with defined standards set for each programme level. It should not advantage or disadvantage particular students or groups of students.

(v) Assessment process should be made clear to all parties involved, i.e. students, staff and verifiers.

1.7 Assessment and Test Plans

1.7.1 An Assessment Plan must be developed and provided to all students before their assessment.

1.7.2 Assessment Plan refers to the overall method of assessing a student/trainee in the course/programme and the criteria for the award of the certificate. It sets out the Theory and Practical tests which have to be administered for the concerned modules and whether coursework is taken into account and its weighting in the overall assessment (*see samples at Appendix 2: Assessment Plan*).

1.7.3 A Test Plan sets out the specification for a particular test. It sets out the type of assignment/questions, test duration and the marking scheme. It is the blueprint to guide the test setter in setting the test paper *(see Section 2, Clause 2.7: performance Tests / Written Tests for further details*).

1.8 Reporting and Recording of Results

It is the responsibility of the module instructor/trainer to keep a record of the evidence presented by the student which enables the assessment decision to be made. Please refer *Appendix 12: QPD17 Procedures for Assessment Results Verification* for further details.

1.9 Student Feedback and Appeals Procedure

(i) The School should ensure that the students are provided with feedback that includes details of the assessment outcomes, the reasons for the outcome, recommendations for further training / improvement, and the appeal and reassessment options.

(ii) The School should have an appeal process in place which allows students to challenge the assessment decision and be reassessed.

(iii) It is the responsibility of the instructor/trainer undertaking the assessment to ensure that, in the event of an appeal, the evidence is kept in sufficient detail to enable an assessment decision to be reviewed.

1.10 Quality Assurance Implementation Personnel

1.10.1 QA Personnel for Monitoring and Evaluation

(i) Academic Manager

(ii) Head of School

(iii) External Verifier

The QA Personnel should encourage unified good practice for effective delivery of teaching programmes: they should also evaluate and monitor assessment policies and procedures. They will ensure that the following are carried out:

(i) Implementation and practice of Assessment and Test Plans.

(ii) Follow up on the External Moderator's or Skill Auditor's recommendations.

(iii) Scheduled Group Course Team Meetings.

(iv) Scheduled counselling session.

(v) Practice of Internal Verification.

(vi) Any other initiatives developed by the School or Campus for quality teaching and assessment practices and enhance the quality of overall programmes.

1.10.2. QA Operative Personnel

(i) QA Officer (e.g. Examination & Assessment Officer)

(ii) Internal Verifier (e.g. Programme Leader, Module Leader)

(iii) Group Leader

(iv) Module Instructor

The role of each QA Operative Personnel is crucial in successful implementation of a programme from beginning to the end; nevertheless, the Group Leader plays the key role in the development and implementation of:

a) Assessment and Test Plans

b) Course Team Meetings
c) Counselling Session for students
d) the Internal Verification, and
e) External Moderator's / Skill Auditor's recommendations

1.10.3 The Principal has the overall responsibility to ensure that the management, administrative and quality assurance systems for all IBTE programmes within the School or Campus are properly and consistently monitored and maintained. This role may be delegated to a separate person, such as an **Examination and Assessment (EAC) Officer.**

1.10.4 The delegated **EAC Officer** will be responsible to ensure that:

(i) Assessment and Test Plans are implemented.

(ii) External Moderator's / Skill Auditor's recommendations are implemented.

(iii) Group Course Team Meetings are scheduled.

(iv) Counselling sessions for students are scheduled.

(v) Internal Verification is carried out efficiently and consistently across the programmes.

(vi) Appropriate Examination Timetables are prepared and implemented.

(vii) All parties are notified of assessment/examination dates well in advance.

(viii) Invigilators understand their roles and responsibilities.

(ix) Examinations are conducted in accordance with IBTE regulations and selected End Examination papers will be checked.

(x) There are appropriate security arrangements for written papers, assessment materials, etc.

(xi) Assessment records are submitted to the Academic Board in accordance with the specified procedures.

2. Competency-based Assessment

2.1 General Information

2.1.1 A competency is the capability to apply or use a set of related knowledge, skills and attitudes required to successfully perform a task/function effectively. Knowledge, skills and attitudes are components a person needs and uses in an occupation that is both observable and measurable and that forms the basis for competency based criteria.

2.1.2 Competency-based Assessment involves measuring performance against set standards rather than the performance of others. It evaluates a student's performance based on pre-defined competencies and their behavioural indicators.

2.1.3 The focus of Competency-based Assessment is on "Outcomes". The outcome is either Competent or Not Yet Competent.

2.1.4 Assessment is the process of collecting evidence and making judgments on whether competence has been achieved as per the set performance criteria. This confirms that an individual can perform to the standard expected in the workplace as expressed by the performance standards developed by IBTE in collaboration with relevant industry.

2.2 Dimensions of Competency

2.2.1 Assessment is the process of collecting evidence and making judgments on whether competence has been achieved. This confirms that an individual can perform to the standard expected in the workplace as expressed by the performance standards developed by IBTE in collaboration with relevant industry.

2.2.2 Competency comprises of the following four (4) dimensions:

i) Task Skills – The student must perform the skills to complete work tasks to the required standard. These skills are specified in the Performance Objective and are often the easiest to identify when preparing an assessment tool.

ii) Task Management Skills (variables) – The student must plan and coordinate different tasks to complete a work task. He/She must be able to do more than one thing at a time and managing the tasks correctly. Incorporating these skills in assessment methods may be better reflects in real work activities.

iii) Contingency Management Skills – The student must respond appropriately to irregularities and breakdown in routine within a job or workplace. The student must use problem-solving skills when things do not go to plan. If the instructor does not have access to the student's workplace to assess these skills, he/she could perhaps use a scenario or questions that ask 'what would you do if...?'

iv) Job/role Environment Skills (outcomes) – In the workplace, the student must be able to follow workplace procedures and practices, deal with workplace expectations such as interruptions or distractions and work well with all work colleagues.

2.2.3 It is important that all four (4) dimensions are assessed within the context of the required performance.

2.3 **Quality Evidence**

2.3.1 Types of evidence are as follows:

(i) Direct - The most desirable form of evidence. Examples are observation checklist, oral presentation, role-play, practical demonstration of specific skills, simulated workplace project, fault finding and video or audio tapes.

(ii) Indirect - Where competence cannot be directly observed indirect evidence is used to infer competence. Examples are formal written tests (including examination), assessment of qualities of a final product, case study and review of previous work undertaken.

(iii) Supplementary - This method is of value in instances where direct and/or indirect forms of evidence gathering provide insufficient information for a valid assessment outcomes and additional evidence is required. Examples are testimonials from employers, reports from supervisor, work diary, logbook and portfolio.

2.3.2 Evidence chosen from the student must meet the four 'rules' of evidence as follows:

(i) Valid
- Evidence of competence must cover the broad range of knowledge and skills (i.e Performance Objective) required to demonstrate competence.
- Assessors need to ensure that the **evidence meets all the specified criteria** (i.e Enabling Objectives and Performance Standards) in the Module Guide.
- Evidence should also match or reflect the type of performance, which is being assessed.

(ii) Sufficient
- This relates to the amount of evidence.
- Assessors must collect enough evidence to satisfy that the student is competent across all elements according to the performance criteria.
- It means collecting evidence over a period of time and in different situations.

(iii) Current
- An assessor needs to determine whether evidence of competence is recent.
- The focus is on whether the person being assessed has current competencies.
- Currency of evidence can be an accumulation of historical and recent activities.

(iv) Authentic
- An assessor must be able to ensure that the evidence to be gathered is the student's own work.
- To determine authenticity, it may be necessary for a third party to validate.

2.4 Selecting Assessment Methods and Assessment Tools

2.4.1 The process for selecting assessment methods (*see samples at Appendix 1: Assessments Methods*) to gather appropriate evidence is as follows:

Step 1 : Identify Skills Areas to cluster for assessment

- A good assessment tasks may involve a number of skills areas to reflect a real work task;
- The degree to which a number of skills areas can be clustered together to reflect a real work activity will vary across all Module Guides;
- Clustering must take into account the work activity, assessment context, training and assessment arrangements for the qualification and the time, resources, facility and personnel available;
- Assessors are required to have a thorough knowledge of the Module Guide they are working with and the relevant workplace environment.

Step 2 : Develop competency profile

- A competency profile will provide an overall picture of a competent person in action;
- It can be a checklist, a written description of the work activity, a list of the characteristics of a competent worker or a job description for an individual performing the activity.

Step 3 : Identify evidence requirements

- Identify the evidence required to determine competence;
- Evidence selected must reflect the skills, knowledge and language encompassed in the competency profile;
- Evidence selected must also comply with the four rules of evidence (*see Section 2, Clause 2.3.2 above*).

Step 4 : Review and select assessment methods

- The list of evidence requirements will be used by the assessor to review the possible assessment methods;
- In identifying the assessment methods, resources and facilities required for the assessment must be considered;
- Selecting the appropriate assessment methods will involve consideration of the student's needs, nature of work activity being assessed, location of the assessment and the requirements of the Module Guide.

Step 5 : Select assessment tools and record evidence matrix

- Once the method has been selected the materials for collecting and analysing the evidence are then chosen or designed;
- The materials are called the Assessment Tools;
- The Assessment Tool is used to describe a document that contains both the instrument and the instructions for gathering and interpreting the evidence;
- Instrument refers to the specific questions or activities developed from the selected assessment method(s) to be used for the assessment;
- Procedures include the information/instructions given to the student and/or the assessors regarding the conditions under which the assessment is to be conducted and recorded;
- Once the assessment methods and tools have been selected, it will be useful to do a mapping exercise to ensure that all the evidence gathered through these tools will meet the requirements of the Skills Area(s);
- The evidence matrix, if done accurately, will help assessors to ensure that evidence collected will be valid and sufficient;

Step 6 : Develop Test Plan (*see Section 1, Clause 1.7 Assessment and Test Plans*).

2.5 Assessment Papers

2.5.1 Only the verified and approved question papers, marking scheme and/or rubric are to be printed and used for assessment.

2.5.2 The allocated marks for each part of a question and the total marks for each question should be shown clearly in the question papers and marking scheme / rubric. This must be tally with the total marks display at the front page of the question papers.

2.5.3 The layout of the question paper must be clear and user friendly. Sufficient space for working and writing must be provided where necessary.

2.5.4 Instructions in the question paper must be clear and concise (*see Appendix 6: Guidelines for Setting Examination Question Papers*).

2.5.5 Long and complex questions should be split up into parts by the use of subsidiary numbering systems.

2.5.6 Ensure that all the diagrams, pictures and/or photographs shown are helpful, necessary and of good quality.

2.5.7 Relate the text and the intended diagrams, pictures and/or photographs closely.

2.5.8 Comprehension text and questions should be printed on the same page or adjacent page.

2.5.9 See *Appendix 12 : QPD-16 Procedures for Preparation of Written Test / Examination Question Papers and QPD-16A Procedures for Preparation of Other Assessment Papers* for further details.

2.6 Common Module Assessment

2.6.1 Common assessment papers are to be prepared and used by all the Schools concerned for all related common modules across all IBTE programmes unless otherwise specified by the PDEC concerned.

2.6.2 The following are some of the common modules across all the IBTE programmes:

(i) Islamic Religious Knowledge

(ii) Melayu Islam Beraja

(iii) Life Skills for Workplace

(iv) Health Safety Security and Environment

(v) Health Safety Environment

(vi) Engineering Science / Basic Engineering Science / Fundamental Engineering Science

(vii) Flow Scheme /Drawing

(viii) Introduction to Oil and Gas Industry

(see Appendix 14: Common Modules for further details)

2.6.3 The procedure for administering the assessment of common modules will be developed by the respective PDEC concerned.

2.7 Performance Tests and Written Tests

2.7.1 Performance tests are used to assess skills whereas written tests (including examination) are used to assess a student's mastery of knowledge tasks and to assess mastery of complex or critical concepts or facts underlying skill tasks. Attitudes can be assessed only by assessing the knowledge required to exhibit the attitude and the voluntary performance of the desired behaviour.

2.7.2 The following are the steps to be followed when developing performance test:

Step 1: Determine exactly what should be tested.
The test should match the task that the trainee/student is required to do to demonstrate competence in the task.

Step 2: Determine whether process, product, or both is critical.
The process is how the student/trainee performs the task; the product is the end result.

Step 3: Construct the items to be included on the test.

If process is important, include only those essential process-related items (critical steps) that will distinguish between someone who can perform the task competently and someone who cannot. Following are some of the tips:

(i) Base the items on the steps identified during the task analysis.
(ii) Begin each item with a verb in the past tense.
(iii) Each item should be observable and objectively assessed.
(iv) Avoid subjective words (such as properly, correctly, enough, well and so on).
(v) Word items so that they can be rated as YES or NO, with YES being the desired response.
(vi) Include only one distinct step per item.
(vii) Each item should be clear, concise, and be able to stand alone.
(viii) Items should be broken down into subitems to avoid repetitious wording.
(ix) List process items in sequential order as they would be performed and observed.
(x) If only a few steps are critical in a lengthy process, the instructor/assessor might want to warn the student beforehand when to stop and have his/her process checked. The instructions to the student/trainer might include a statement such as "Check with instructor before installing head."

If the product is critical, the test items will describe critical characteristics of the completed product (such as size, shape, colour, condition, and so on) that would indicate competence or lack of competence. Following are some of the tips:

(i) Begin items with a verb in the present tense.
(ii) Do not use repetitious words or phrases in succeeding items.
(iii) Include exact indication of how competence will be determined for each characteristics (e.g. ±0.001 inch; within 2 degrees; at least three stiches; etc.)
(iv) Do not settle for unreasonably low standards.

Step 4: Determine how items will be rated.

Commonly two methods are used i.e. rating scale and checklist.

Examples:

Performance Test Item: 1. Are ends of cut stock free of burrs?	
Rating Scale	*Checklist*
Acceptable *Unacceptable* *5* *4* *3* *2* *1*	*Yes* | *No*

It is highly recommended that checklists to be used for performance tests because it is less subjective. Instructor/Assessor may want to use satisfactory/unsatisfactory; pass/fail; yes/no; acceptable/unacceptable.

Step 5: Determine the minimum acceptable score for mastery.

Percentage varying from 80% or lower up to 100% are common. How many of the items on the performance test must a student/trainer accomplish before being considered competent? If ONLY essential process and product related items be included on performance tests, the student/trainer should complete the test with 100% accuracy to be considered competent.

Step 6: Write directions for the student/trainee.

The directions/instructions to the student should be worded carefully so that they explain:

(i) The purpose of the test
(ii) The general testing situation
(iii) Exactly what the student/trainer is to do
(iv) Any special restrictions, cautions, and so on
(v) Any time limit
(vi) How mastery will be determined
(vii)Anything else the student/trainer needs to know

Step 7: Assemble the test and try it out.

After all components of the test constructed, they will be assembled into actual performance test. It is always a good idea to try out the test with

a fellow instructor and one or two students before using it to evaluate students/trainers.

Appendix 6a shows a sample performance test that might be used in a competency-based training programme.

2.7.3 Regardless of the type of test items used to make up a written tests, the following Guidelines should be followed:

(i) Make certain that the test items assess the student's mastery of the task. Do not include test items that question the learner on content outside the scope of the task and not included in the learning activities.

(ii) Remember: The primary purpose of testing is to assess whether or not each student/trainee has mastered a task.

(iii) "Trick" items do nothing but waste time and confuse and frustrate the student/trainee.

(iv) Avoid items that force the student/trainee simply to recall facts.

(v) Include enough, but only enough items on a test to fully assess the student's/trainee's mastery of the key concepts or facts covered in the scope of the task itself. Broader and more complex knowledge tasks will require more test items.

(vi) Make sure that the test items require a high level of learning on the part of the test taker if the task is written at a high level.

(vii) A good test should be easy to take and easy to score.

(viii) Tests should be fair. Questions should relate only to material the student/trainee should know and an inflexible key should be used in scoring.

(ix) Tests also reflect the effectiveness of the learning activities and resources students/trainees are using. When several students fail to reach mastery of a task, the trouble may lie with the learning materials.

(x) Assessors should keep track of how often students miss specific test items. When a higher-than-usual number of students/trainees miss a particular test items, it probably needs to be reworded.

(xi) Each item on a test should stand alone. Information for subsequent items should not be revealed in an earlier item.

(xii) Have someone to check and verify your test before administering it to make sure that the directions and test items are clear.

(xiii) Include clearly worded instructions/directions for each test. Include the purpose of the test, how to respond to each kind of item, how many must be answered correctly, and what time limit is imposed.

(xiv) Avoid questions from quotes, specific pages of books, or other trivial sources.

Source: Blank, E. William (1982) Handbook for Developing Competency-based Training Programs

2.7.4 A **Test Plan for theory** test may set out in a Table of Specifications comprising the following information (*see sample at Appendix 3: Test Plan*):

(i) Theory content in Module Guide to be tested.

(ii) Number of questions for each topic

(iii) Type of test items e.g. multiple choice, essay

(iv) Taxonomy of test item. It is recommended that the written tests for NTec and ISQ programmes should cover the Lower Order Thinking Skills cognitive domains namely Knowledge, Comprehension and Application (*see Appendix 4: Bloom's Taxonomy and the Different Levels of Questions*).

(v) Marking scheme (solution and scoring)

(vi) Duration of test

(vii) Grading system

2.7.5 A **Test plan for performance/practical test** may set out with the following:

(i) Scope of skills to be tested

(ii) Performance Criteria

(iii) Test project design specifications

(iv) Tools, equipment and materials to be provided

(v) Marking scheme

(vi) Duration of Test

(vii) Grading system

2.7.6 Types of test items for written tests may include one or more of the following:

(i) Recognition Items

- Multiple Choices
- True / False
- Matching

(ii) Recall Items

- Short answer (requiring one word, a phrase or a sentence for the answer)
- Fill in the Blank / Completion
- Restricted response essay
- Extended response essay

Generally, Recognition type of item is more suited for use in competency-based training program especially the well-constructed multiple choice item is perhaps the most suitable test item to use for written tests.

2.7.7 The allocation of weighting to each type of test items depends on the criticality of the Learning Outcomes with respect to the competency to be assessed. The table below provide some recommendations but not necessary limited to the following:

Type of Questions	Weighting MCQ	Weighting FIB	Weighting SAQ	TOTAL
MCQ and SAQ	≤ 20%	-	≥ 80%	100%
FIB and SAQ	-	≤20%	≥ 80%	100%
MCQ, FIB and SAQ	≤20%	≤20%	≥ 60%	100%
MCQ	-	-	100%	100%
SAQ only	-	-	100%	100%

2.7.8 The number of test items should not exceed the allocated test duration for the test/exam. Depending on the nature of test/exam and types of questions the following is recommended as a guide in setting the test duration:

Type of Questions	Duration per Question
Multiple Choice Question	½ to 2 minutes
Short Answer Question	5 to 10 minutes
Essay Question	20 to 30 minutes

2.7.9 The following table will provide some guidance in setting the **duration** of written tests:

Maximum Marks	Reading Time	Answering Time	Total time for Assessment
25	10 minutes	1 hour	1 hour 10 minutes
50	10 minutes	1 hour 30 minutes	1 hour 40 minutes
100	10 minutes	2 hour 30 minutes	2 hour 40 minutes

Note: Reading time refers to the duration where student/trainee can only read the questions in the question paper and plan their answers. However, they are not allowed to write their answers in the answer scripts during this period.

2.7.10 **Multiple Choice Questions (MCQ)**

A multi choice test/examination can cover a wide content area and establish tight control over content. It is more efficiently and reliably scored. It can address various levels of cognitive complexity and less affected by writing ability and bluffing. The following are the guidelines recommended for MCQ:

The Stem

(i) The stem (i.e. the statement part of the question) should be an incomplete statement which leads into the answers.

(ii) If the question is written in negative terms, underline the word making the stem negative (*not, worst, etc.*).

(iii) Avoid splitting a multiple choice item over two pages.

(iv) Avoid ending the stem with "a" or "an" since some alternatives may begin with vowels and some with consonants.

(v) The stem should be complete enough that students who have mastered the task should be able to determine the correct answer looking at the alternatives.

(vi) The stem should present the problem in a clear and unambiguous manner. Avoid stems that are vague or too short.

(vii) Avoid clues in the stem which give away the correct alternatives.

(viii) Punctuate the stem properly; use question mark for a question, a period (i.e. full stop) for a statement, and a colon for an incomplete sentence or phrase.

(ix) You can refer to or include diagrams, pictures, schematics, or other types of problems in the stem.

The alternatives

(x) May be single words, phrases, or complete sentences.

(xi) Should be written at a level appropriate for the students/trainees.

(xii) Should be very similar to one another in length, point of view, and grammatical structure.

(xiii) Responses should all be reasonable and plausible.

(xiv) If numerical, should be in ascending or descending order.

(xv) Should not give any hint of the correct answer through arrangement, wording, or punctuation.

(xvi) Should each appear on a separate line and be labelled by capital letters or other easily identifiable means.

(xvii) Use at least four and preferably five possible answers.

(xviii) Should not follow any pattern of correct answers; scatter the correct responses and having approximately the same proportion of alternatives A, B, C, and D as the correct response

(xix) Should be as short as possible.

(xx) Should include only *one* correct answer.

(xxi) Should not use "all of the above" or "none of the above" just to come up with enough alternatives.

(xxii) Should each contain only one complete thought.

2.7.11 **True and False Questions**

(i) This type of questions is mainly for assessing Knowledge and Comprehension.

(ii) Make approximately half of the questions true and half false

(iii) Make the method of indicating responses as simple as possible.

(iv) Do not lift statements directly from books.

(v) Use direct statements. Avoid words with general meanings such as large, great, many and few.

(vi) Whenever you use words such as no, never, always, may, should, all and only be sure that they do not make the correct answer obvious.

(vii) Do not make the true statements consistently longer than the false statements.

(viii) Avoid negative statements.

(ix) Consider using a modified true and false test (students write in correct answers for false items).

2.7.12 Matching Questions

(i) Matching questions are similar to multiple choices, but are easier and more efficient to construct.

(ii) The questions can be written to assess Knowledge, Comprehension and Application level behaviours.

(iii) The questions consist of a column of premises, a column of responses and directions for matching the two.

(iv) Use homogeneous options and items.

(v) Arrange options and items alphabetically or numerically.

(vi) Place the shorter responses in column B.

(vii) Limit the number of items within each set.

(viii) Place options on the same page.

(ix) The number of possible responses should exceed the number of questions.

(x) Provide complete directions. Directions should tell if a response can be used more than once.

2.7.13 Fill in the Blanks (FIB) or Short Answer Questions

(i) Fill in the blanks asks a student to complete a sentence with a word or short phrase and short-answer poses a question that can be answered with a short phrase.

(ii) It is typically measure rote objectives.

(iii) The items should be written that clearly imply the type of response desired.

(iv) Use only one blank per item. Avoid using a long quote with multiple blanks to complete.

(v) When working with definitions, supply the term, not the definition, for a better judge of student knowledge.

(vi) Put the blank space at the end of the item, if possible to facilitate scoring.

(vii) Avoid using statements taken directly from the book.

(viii) For number, indicate the degree of precision/units expected.

(ix) When writing Short Answer Items, questions must be carefully worded so that all students understand the specific nature of the questions asked and the answer required.

2.7.14 **Essay Questions**

(i) Before writing the question, know exactly what mental process of the student you want to bring out.

(ii) Start essay questions such as compare, contrast, give the reasons for, present the arguments for and against, give original examples of, explain how or why.

(iii) Use clear, precise questions.

(iv) Give students freedom to respond within broad limits.

(v) Do not have too many questions for time available.

(vi) Do not mix essay and objective questions when time is limited.

(vii) Make a list of all pertinent points that should be covered in the student's answer for each question. Use these when grading.

2.7.15 **Bloom's Taxonomy for Written Tests**

The Written Tests questions should cover some or all of the following cognitive domains:

- Knowledge, Comprehension and Application (Lower Order Thinking Skills)
- Analysis, Synthesis and Evaluation (Higher Order Thinking Skills)

2.7.16 The following documents must be prepared and submitted for verification and approval for any written tests:

(i) 3 sets of the question papers with minimum 30% variation among the sets (*see Appendix 6: Guidelines for Setting Test/Exam Question Papers and Appendix 6b: Examination Question Paper Template*);

(ii) 3 sets of the Marking Schemes; and

(iii) 1 - 3 sets of the Table of Specifications

2.7.17 **Table of Specifications (TOS)** (*see samples at Appendix 5: Table of Specification)*

(i) The Table of Specifications is a test/exam blue print.

(ii) The purpose of TOS is to ensure proper emphasis given to all elements of a course of study and it also improve content validity.

(iii) It is a two-way chart which describes the topics to be covered by a test/exam and the number of marks which will be associated with each topic.

(iv) The TOS identifies the objectives and skills that are to be measured:

- Included each objective's relative weight on the test/exam
- Objectives should collectively represent as much as possible what it is that you want to measure.
- Objectives should be specific enough to allow you to write items that measure the particular skill of interest, but general enough to allow for multiple items to be written from a common objective.

(v) The TOS should be developed before items are written.

(vi) Some measure of item difficulty can also be built into the TOS i.e. percentage of easy, medium, or hard items.

2.8 Assignments

2.8.1 Assignments includes report/ presentation/portfolio/laboratory report.

2.8.2 Assignments are tasks requiring student/trainee engagement and a final tangible product that enables you to assess what your students/trainees know and do not know. They represent one of the most common ways to assess learning.

2.8.3 In designing the assignment, the GRASPS+R, shown in the Table 1 below, adapted from Grant Wiggins and Jay Mc Tighe (1998) could be used (see Appendix 7: Performance Assessment GRASPS for further details).

Goal	What is the competency to be assessed?
Role	What is the role of the student in this assessment?
Audience	Who is the audience considering the role identified? *(Identify target audience within the context of the scenario)*
Situation	What is the situation or task where this performance or project is required? *(Set the context of scenario or Explain the situation)*
Product/ **P**erformance for Evaluation	What product or performance is required in this situation? *(Clarify what the students will create and why they will create it)*
Standards	What are the standards or criteria in evaluating the product or performance? *(Identify specific standards for success)* *(Provide students with a clear picture of success)*
Rubric	What kind of rubric format is most appropriate given the time and resources needed in doing the task?

Table 1: GRASPS+R Model

2.8.4 Assignments should be assessed **INDIVIDUALLY** and by at least **TWO** instructors/assessors.

2.8.5 The assignment format should follow the template provided in *Appendix 8: Assignment Assessment Template.*

2.8.6 An assignment created by an instructor or a team of instructors, should have TWO (2) versions of rubrics namely, one for students and the other version for instructors (see *Section 2, Clause 2.10: Developing Rubric* for further details).

2.8.7 Student's version of the assignment should only include:

(i) The cover page

(ii) Students' instructions

(iii) Learning outcome

(iv) Assignment details: scenario & performance tasks

(v) Performance standard

(vi) Health, Safety and Environment (where necessary & applicable)

(vii) Duration of assignment

(viii) Start date and finish date

(ix) Submission date and time

(x) Rubric (only general requirements are provided. No specific requirements or answers are included)

2.8.8 Assessors' version of the rubric for assignment should include the expected answers for each and every criteria assessed.

2.8.9 Should any question in the assignment be related to calculation, sketching or drawing (graphs/diagrams) and/or requiring a direct answer, then the format for the marking will be similar to marking scheme for a written test.

2.8.10 An assessor is allowed to compute or keep the marks in softcopy, **HOWEVER**, for students' feedback and internal verification purposes, a hardcopy of the marks should be kept.

2.8.11 All assignments must be submitted on the due date to the Examination and Assessment Centre of the school concerned.

2.9 **Practical Works (Including Experiment and Laboratory Works)**

2.9.1 Practical is an assessment used to assess students' hands on ability (skill). It should be conducted on site, in the campus. Students are **NOT ALLOWED** to bring or do their work at home.

2.9.2 Practical should be assessed **INDIVIDUALLY** and by at least **TWO** instructors / assessors.

2.9.3 Skills assessment comprises of two (2) types:

(i) Process Evaluation ~ Emphasis is on the process of doing the task such as:

- Observance of safety precautions; hygiene requirements; procedures; time/schedule given;
- Correct use of tools
- Economic use of materials

(ii) Product Evaluation ~ Emphasis is on the end product of the task such as:

- whether product can work
- accuracy of dimensions
- product finish/presentation quality

2.9.4 The following information must be provided for practical test paper:

(i) Test project

(ii) Test duration

(iii) Tools, equipment and materials provided

(iv) Drawing if any

(v) General instructions

(vi) Specific information or scenario of project tasks

(vii) The performance tasks which the student/trainee has to carry out

(viii) Marking scheme

2.9.3 The Practical Format should follow the template as provided in the samples in *Appendix 9: Practical Work Assessment Template and Appendix 10: Laboratory Work Assessment Template* for further details.

2.9.4 Practical Assessment created by an instructor should have TWO (2) versions of rubrics namely, one for students and the other version for instructors (see *Clause 2.10: Developing Rubric* for further details).

2.9.5 Students' version of the practical should only include:

(i) The cover page
(ii) Students' instructions
(iii) Learning outcome
(iv) Practical details / Sequences of operation
(v) Performance standard
(vi) Health, Safety and Environment (where necessary & applicable)
(vii) Location
(viii) Duration of practical
(ix) Start date and time
(x) Submission date and time
(xi) Required materials, tools and equipment
(xii) Rubric (without specific answers)

2.9.6 Instructors' or assessors' version of the practical should include:

(i) The cover page
(ii) Rubric for practical should include possible expected answers
- How each practical details / sequence of operation relates to Enabling Objectives in the Module Guide
- Raw score and their corresponding evidences for each set value.
- Task weighting in term of criticality and difficulty
  - Critical level ~ how important is the task.
  - Difficulty level ~ how difficult to perform the task.

Criticality C	Difficulty D	Weighting W
1 least critical 2 critical 3 very critical	1 least difficult 2 difficult 3 very difficult	W = C x D
Example: 3	2	3 x 2 = 6

- Maximum possible marks
- Actual marks obtained by students/trainees
- Final Marks obtained by students/trainees (over 100%)
- Feedbacks

2.9.7 In practical assessment, if there is any question related to calculation, sketching or drawing (graphs / diagrams) and/or requiring a direct answer, the marking format should be similar to marking for a test. See example below:

For an experiment on electrical circuit, students have to **connect the circuit** as per the diagram given, **take down the readings** and **calculate the current** flowing into the circuit. Therefore:

(i) Connecting the circuit is considered as practical since the students are expected to demonstrate their skill (assessing the process)

(ii) Taking down the readings (entering the value into a data sheet) and the calculations will have a normal marking scheme

(iii) The total marks for the experiment will be as follows::

Total Marks = Practical Rubric + Data & Calculation Marks

2.9.8 A scoring sheet will be used to score the students/trainees in the event of observation, interview, etc., (i.e. assessments that require on the spot marking). Any marks written on the scoring sheet should be **TRANSFERRED** to individual Students' Practical Instruction booklet/leaflet.

2.10 Developing Rubrics

2.10.1 There are three (3) types of rubric namely Holistic Rubric; Analytic Rubric and Anaholistic Rubric as follows (*see Appendix 11: Assessment Rubrics for further details*):

(i) Holistic Rubric

- It describes the overall quality of a performance or product.
- It is single criteria rubrics (one-dimensional) used to assess students'/trainees' overall achievement on an activity or item based on predefined achievement levels.
- There is only one rating and the performance levels and their corresponding indicators are either presented in vertical or horizontal manner. The performance descriptions are written in paragraphs and usually in full sentences.
- This is recommended when the time of preparation and/or presentation is short.

(ii) Analytic Rubric

- It describes the quality of a performance or product in relation to a specific criterion.
- It is two-dimensional rubric with levels of achievement as columns and assessment criteria as rows or vice versa.
- The criteria are rated independently to give a better picture of the quality of work or performance.
- The assessor may assign different weights (value) to different criteria and include an overall achievement by totalling the criteria.
- This is recommended when the time of preparation and/or presentation is long. This is also the rubric highly recommended to be used by all instructors/assessors in IBTE.

(iii) Anaholistic Rubric

- This is a hybrid of analytical and holistic rubrics which identified specific components of an assignment that will be graded.
- It identifies the criteria which need to be assessed and the maximum grade which may be awarded for each component of an assignment.
- The assessor must decide what grade to award for each component based on the criteria provided.

- The criteria may be weighted as well, if necessary and appropriate.

2.10.2 The following information should be made available in a rubric:

(i) Competency to be assessed – this should be a behaviour that requires either a demonstration or creation of product or outcomes of learning (i.e. Performance Objectives/Performance Standards).

(ii) Performance Task – the task should cover multiple foci, be authentic and feasible.

(iii) Dimensions, Evaluative Criteria and their indicators – the aspects of the task that merit evaluation, which could include both the process in doing the task and its product or to cover knowledge, skill, and attitudes in doing the task. They should be made clear using observable traits (i.e. Enabling Objectives).

(iv) Performance Levels – These levels could vary number from 3 or more preferably even number .

(v) Qualitative and Quantitative descriptions of each performance level – these descriptions should be observable to be measurable.

2.10.3 The following are some guidelines when developing rubrics:

(i) Set clearly the competency that has to be captured by the rubric.

(ii) Identify the essential and observable criteria of an excellent performance or quality product.

(iii) Clarify the meaning of each criterion and the performance levels.

(iv) Describe the gradations of quality product or excellent performance.

(v) Aim for an even number of performance levels to avoid the central tendency source of error.

(vi) Keep the number of criteria reasonable enough to be observed or judged.

(vii) Arrange the criteria in order based on degree of priority or the likelihood to be observed.

(viii) Determine the weight/points of each criterion and the whole work or performance in the final grade.

(ix) Put the descriptions of a criterion or a performance level on the same page.

(x) Highlight the distinguishing traits of each performance level.

(xi) Check if the rubric encompasses all significant traits of a performance or product

(xii) Check again if the competency set for assessment is captured by the rubric.

2.10.4 The instructor/assessor may follow the following eleven (11) steps when developing rubric:

(i) Step 1: Choose the assignment

Challenge yourself to think about whether or not a rubric is the best assessment tool for the intended assignment. Design the assignment and the accompanying rubric to align with student learning objectives (i.e. performance objectives).

(ii) Step 2: Describe the perfect submission

What does the "perfect" version of the student submission look like for the assignment? Think about the details of what great student work would entail.

(iii) Step 3: Choose the rubric type

Please see Section 2, Clause 2.10.1 for further details

(iv) Step 4: Create grading scheme and layout

How many points will this assignment be worth? What will the rubric look like on the page? Since this is a visual tool, it is important that it is organised and can be read easily.

(v) Step 5: Write criteria/items and descriptors

Write the individual criteria/items that you will assess and describe the characteristics of each criteria/item for target, acceptable, and unacceptable work.

(vi) Step 6: Test the rubric

Grade past student work or other examples to ensure the rubric works the way it is intended.

(vii) Step 7: Teach the rubric

Once finalised and validated, you must teach the rubric to your students. The students must understand the rubric so that it can be used to both guide and assess their work.

(viii) Step 8: Make the rubric available when the work is assigned

Rubric should be given to students/trainees before they begin their work. Students/trainees will use the descriptions provided in the rubric to guide their efforts and work.

(ix) Step 9: Assess work and enter grades

Effective and well-designed rubrics make the grading process accurate, reliable, and quick. Once students/trainees have turned in their work, use the rubric to assess their submissions. Remember to transcribe grades from the graded rubrics to Assessment Record Form.

(x) Step 10: Return graded rubrics to students

Students want to see their grades and assessor's feedbacks.

(xi) Step 11: Revise the rubric

Do not wait until the next time to give the assignment to revise the rubric. You've just used the rubric 20+ times to grade student work and are very familiar with the document, make the revisions while the process is still fresh on your mind.

3. Internal Verification

3.1 Internal verification is carried out by the School to ensure that the assessment practices and decisions are in accordance to the IBTE Rules and Procedures.

3.2 The procedure for preparation of assessment papers can be referred at QPD-16 Procedure for Preparation of Examination Question Paper and QPD-16A Procedure for Preparation of Other Assessment Paper (*see Appendix 12: Quality Procedure Documents*).

3.3 The procedure to quality assure the assessment results can be referred at QPD-17 Procedure for Assessment Results Verification (*see Appendix 12: Quality Procedure Documents*)

3.4 The records of Internal Verification form should be controlled and filled-up by Group Leader.

3.5 It is the responsibility of a Head of School to ensure that internal verification is carried out professionally within the School.

3.6 The QA Personnel for Monitoring and Evaluation and the Examination and Assessment Officer shall have access to all Programme Files for monitoring of programmes. On completion of a programme, the Programme File will be kept by the Head of School or Programme Leader.

3.7 The **process for internal verification** will be carried out as follows:

3.7.1 **Appointment of Group Leader, Setter, Vetter, Assessor and Internal Verifiers**

(i) Prior to the start of any programme, a Group Leader would have been appointed.

(ii) Programme Leader / Module Leader will normally acts as the Internal Verifier unless otherwise specified by the Head of School.

(iii) The Head of School or Programme Leader / Module Leader will ensure that Setter, Vetter, Assessor and Internal Verifiers are appointed for modules (or groups of modules) within the programme. An appointment list will be circulated for ready reference.

(iv) Setter, Vetter, Assessor and Internal Verifier must be well versed with the module(s). They are usually members of teaching staff within the School/Campus.

3.7.2 Planning of assessments

(i) The Group Leader / Module Leader, through the course teams, will facilitate the planning of assessments:

a. unit assessments;

b. integrated assignments (where applicable);

c. assessment plans.

(ii) The Head of School or Programme Leader will issue a master list of Setter, Vetter, Assessor and Internal Verifier for all programmes within the School.

3.7.3 Selecting the assessment instrument, devising the assessment, the duration and the marking scheme

(i) The IBTE Module Guide will specify the type of assessment instrument expected. Where it is not specified, it would have been identified during the assessment planning stage.

(ii) The assessment should be devised early enough to allow time for internal verification to take place.

(iii) Ensure appropriate coverage of the Performance Objectives to the specified Performance Standards as in accordance to the Module Guides.

(iv) For written tests/exams, a test plan will be prepared (*see Section 1: Clause 1.7.3 and Section 2: Clause 2.7.4 and 2.7.5*).

(v) For an assignment, all possible acceptable evidence and how this will be marked should be decided and documented.

(vi) All possible and acceptable responses must be anticipated.

3.7.4 Vetting the assessment and the marking scheme

(i) All formal assessments will be vetted and internally verified.

(ii) The paper Setter will fill in the internal verification form (*see Appendix 13: Quality Procedure Forms)* which is submitted together with the assessment instrument, sample answers, marking scheme and table of specification, to the Vetter for vetting purposes.

(iii) The Vetter records his/her comments/suggestions on the internal verification form and returns it to the paper Setter.

(iv) Where amendment(s) is required, the paper Setter will make the necessary amendment(s) in line with the agreed recommendations.

(v) Where there is a difference in opinion between the paper Setter and Vetter, the Head of School or Programme Leader / Module Leader will seek the opinion of another subject specialist to arrive at a mutually agreed decision.

(vi) The paper Setter and Vetter must be aware of assessment deadlines and manage their responsibilities accordingly.

(vii) All internally verified and amended assessment instruments will be submitted to the Examination and Assessment Officer (EAC) through the Head of School or Programme Leader / Module Leader according to specified times as prescribed by the Campus. The Examination and Assessment Officer will be responsible for making sufficient copies of the End Examination for the assessment.

(viii) In addition, some examination papers may need to be verified by External Moderator (if necessary) for some programmes (*see also Section 4 External Verification*). The verification process should commence at least two (2.) months prior to End Examination date.

3.7.5 Carrying out the assessment

(i) Ensure the following conditions when carrying out a written tests especially during the Examination Week:

a) the assessment is being carried out in a quiet environment;

b) consistent time restrictions are implemented;

c) invigilation must be provided for End Examination: an invigilator is responsible for the conduct and integrity of all assessments. A module instructor must not invigilate his/her own class when undergoing End Examinations. The ratio of students and invigilator can be 1:20. The Examination and Assessment Officer may make an invigilator schedule for centralised End Examination.

(ii) When carrying out assessments of practical skills, students must be briefed that they are being assessed.

3.7.6 Marking and Feedback (for students)

(i) While marking the answer scripts, assessment decisions must be objective, consistent and based on the criteria laid down in the marking scheme or assignment/project brief/matrix/rubric.

(ii) The 1st assessor will fill in the appropriate internal verification form (*see Appendix 13: Quality Procedure Forms*), which is submitted together with the graded answer scripts to the 2nd assessor for checking (*see Appendix 12: QPD-17 Procedures for Assessment Results Verification*).

(iii) In certain modules (e.g. Projects), groups of assessors may be used.

(iv) The 2nd assessor is required to check all answer scripts and records his/her feedback on the internal verification form and returns it to the 1st assessor. Where there is a difference in opinion between the 1st assessor and the 2nd assessor, the matter is referred to the Head of School or Programme Leader who will seek the opinion of another subject specialist to arrive at a decision.

(v) All internal verification forms and assessment instruments are to be kept by the Group Leader in the programme file.

(vi) Feedback to students on their assessments must be comprehensive and identify clearly any remedial action and allows students to develop their skills and knowledge and improve grades for future assessments. Just writing a phrase without any reason, examples "Good answer", "Standard can be improved", or "Example is not given" or just a simply awarding grade "M" or "P", do not serve the purpose of helping students to distinguish the level of their academic performance. The instructors/Trainers are expected to give good and helpful feedback to students. These include: written feedback; verbal contact; one-to-one tutorial discussions; group discussion (feedback) and electronic methods

3.7.7 Recording assessment decisions/results

(i) The results will be recorded on the appropriate AR-1 form by an authorised personnel such as Examination and Assessment Officer, Group Leader or Module Instructor.

(ii) On completion of the module, the completed AR-1 form along with unit attendance is submitted to the Group Leader.

4. External Moderation / Skill Auditing

4.1 Some programmes may also subject to external moderation (including skill audit) as an additional requirement.

4.2 An External Moderator / Skill Auditor will be appointed by the IBTE Secretariat to continuously monitor the implementation of IBTE programme(s). The number of External Moderator / Skill Auditor will depend on the number and type of programmes offered by the Campus.

4.3 **The responsibilities** of an External Moderator / Skill Auditor are expected but not limited to the following:

(i) Ensure that those involved in implementing the programmes at the School:

(a) use an updated and endorsed Programme/Module Guides;

(b) understand the IBTE Academic Policy and Procedures.

(ii) Check and monitor institutional assessment practice, planning and procedures, particularly the internal verification procedures.

(iii) Ensure that School(s) maintain the national standards of qualifications awarded by IBTE.

(iv) Sample evidence of assessment activities in order to verify the assessment decisions and achievement.

(v) Provide appropriate advice, information and support to course team members for the continuous improvement of the programme. However, the External Moderator / Skill Auditor are not expected to provide the sample of the assessment or examination paper to School(s).

(vi) Provide accurate and constructive feedback to all relevant parties on the delivery of the programme as well as operation of the School(s) assessment system.

(vii) Promote best practice.

(viii) Confirm that School(s) have implemented any corrective actions required.

(ix) Report back to IBTE through the IBTE Secretariat.

5. Glossary of Terms

Definitions

Assessment of Learning: Measure the knowledge, skills and attitudes gained in the training programme.

Attitudes: The founding reasons behind the need for certain knowledge or why skills are performed in a specified manner.

Competency: A competency is the capability to apply or use a set of related knowledge, skills, and attitudes required to successfully perform 'critical work functions" or tasks in a defined work setting. Competencies often serve as the basis for skill standards that specify the level of knowledge, skills, and attitudes required for success in the workplace as well as potential measurement criteria for assessing competency attainment. Competencies are relevant to an individual's job responsibilities, roles and capabilities. It also embodies the ability to transfer and apply skills and knowledge to new situations and environments.

Competency-Based Training: A training approach geared to the attainment and demonstration of knowledge, skills and attitude to meet industry-specified standards rather than an individual's achievement relative to others in a group.

Curriculum: A plan for a structured series of learning experiences and associated assessment of achievement against established learning outcomes

Demonstrations: The act that give students opportunities to show their mastery of subject-area content and procedures.

Essays: A composition that assess students understanding of a subject through a written description, analysis, explanation, or summary.

Evaluation of Behaviour: Measure whether the learner can perform the competency in the actual job situation. It is usually done 60 or 90 days after the training is conducted.

Evaluation of Instruction: Gather the learner's opinions about the instructional delivery. Ask about how well the instruction was managed.

Experiments: A test done in order to test how well students understand scientific concepts and can carry out scientific processes.

Group Projects: A number of students work together on a complex problem that requires planning, research, internal discussion, and group presentation

Impact Evaluation: Measure the results of training in terms of the attainment of he goals set by the institution.

Instructional Media: Package that supports the teaching and learning with a variety of audio-visual aids.

Knowledge: What a person needs to know to perform the work in an informed and effective manner.

Learning Objective: Learning objectives describe what the learner should be able to achieve at the end of a learning period. It is associates to the *Enabling Objective* in the Module Guide. Learning Objectives should be specific, measurable statements and written in behavioural terms. In short, learning objectives say *what* we want the learners to know.

Learning Outcome: It is a statement that escribes exactly what the student/trainee should be able to do while in the training programme to *demonstrate mastery of a competency* after the learning activities have been completed. It focused on the desired student performance *at the end* (terminal point) of the learning process.

Objective: A module objective describes what a member of stuff will cover in a Module. They are generally less broad than goals and broader than student learning outcomes. Objective is associated to the Aims of the Module in the Module Guide.

Off-the-job Assessment: Assessment is carried out at an educational instution or dedicated training environment.

Performance-based Assessment: Measures students' ability to apply skills and knowledge learned from a unit or units of study.

Performance Tasks: Tasks that ask students to create products or perform tasks to show their mastery of particular skills. These are normally open-ended and call for the application of knowledge and skills, not just recall or recognition.

Performance Test: An instrument to help the instructor to judge whether or bot the student/trainee can actually perform the task in a job-like setting to some minimum level of acceptability.

Portfolios: A piece of work that allow students to provide a broad portrait of their performance through files that contain collections of students' work, assembled over time

Practical Work: Job sheets and work sheets for trainees/students to practice and consolidate skills learned.

Progress Test: Tests (phase tests / short tests/ class tests) and quizzes to gauge trainee's/ student's learning progress and provide feedback to the instructors.

Rubric: A measuring instrument used in rating performance-based tasks. It comprises a coherent set of criteria for students' work that included descriptions of levels of performance quality on the criteria. It is designed to measure the attainment of learning competencies that require demonstration of skills or creation of products of learning.

Skills: Application of knowledge to situations where understanding is converted into a workplace outcome.

Training Standard: Skills standard, assessment scheme and tests to determine trainee's mastery of the course content.

Training Specifications: Instructional objectives for instructors to teach.

List of Abbreviation

&	and
AAR	After Action Review
ADDIE	Analyse, Design, Develop, Implement and Evaluate (Model for Curriculum Development)
AM	Academic Manager
APL	Assistant Programme Leader
AAS	Agro Technology & Applied Science Campus
ATC	Agro Technology Campus
AVI	Aviation
BC	Business Campus
BDQF	Brunei Darussalam Qualification Framework
BDTVEC	Brunei Darussalam Technical and Vocational education Council
BMA	Brunei Maritime Academy
BTS	Building Technology Services
BUS	Business and Financial Services
CBA	Competency-Based Assessment
CBET	Competency-Based Education and Training
CBT	Competency-Based Training
CDO	Curriculum Development Officer
CEO	Chief Executive Officer
CPC	Competency Profile Chart
CPDD	Curriculum Planning and Development Division
DTE	Department of technical Education
EAC	Examination and Assessment Centre/Committee
EEC	Energy and Engineering Central
EES	Energy and Engineering Satellite
EO	Enabling Objective
etc.	Et cetera
GC	Group Coordinator
GRASPS	Goal, Role, Audience, Situation, Product/Performance and Standards
HNT	Hospitality and Tourism
HNTec	Higher National Technical Education Certificate
HOS	Head of School
IBT	Institution-based Training

IBTE	Institute of Brunei Technical Education
ICF	Industry Competency Framework
ICT	Information and Communications Technology
ILO	Industrial Liaison officer
ISC	Industry Steering Committee
ISQ	Industrial Skills Qualification
JBC	Jefri Bolkiah Campus
KPI	Key performance Indicator
MC	Mechanical Campus
MCQ	Multiple Choice Questions
MG	Module Guide
MIB	Melayu Islam Beraja
ML	Module Leader
MOE	Ministry of Education
NRC	Nakhoda Ragam Campus
NTec	National Technical Education Certificate
NQF	National Qualification Framework
OJT	On-the-Job Training
OffJT	Off-the-Job Training
OM	Operation Manager
OPITO	Offshore Petroleum Industry Training Organization
PDCA	Plan, Do, Check and Act
PDEC	Programme Development and Evaluation Committee
PG	Programme Guide
PL	Programme Leader
PO	Performance Objective
PS	Performance Standard
QMD	Quality Management Division
QMET	Quality Maritime Education and Training
QMS	Quality Management System
QPD	Quality Procedure Document
QPF	Quality procedure Form
RTO	Registered Training Organisation
RTP	Registered Training Partner
SAQ	Short Answer Questions

SAR	Student Assessment Result
SBC	Sultan Bolkiah Campus
SEAMEO VOCTECH	Southeast Asian Ministers of Education Organisation Regional Centre for Vocational and Technical Education
SMART	Smart, Measurable, Attainable, Realistic and Time-bound (Principles in Writing Learning Outcome)
SoW	Scheme of Work
SPN 21	Brunei Darussalam National Education System for the 21st Century
SSRC	Sultan Saiful Rijal Campus
TOS	Table of Specifications
TVET	Technical and Vocational Education and Training
VTE	Vocational and Technical Education

ASSESSMENT METHODS

Assessment Method	Description	Tools
(i) Observation in Workplace	Student/Trainee undertakes real work activities at the workplace and demonstrates processes and/or the steps to produce products. Demonstrations give students opportunities to show their mastery of subject-area content and procedures.	• Instruction to students/trainees and assessors. • Observation checklist. • Description of competent performance.
(ii) Observation in simulated work environemnt	Student/Trainee undertakes real work activities at the simulated work environment and demonstrates processes and/or the steps to produce products. This may also carry out through experiments where it tests how well students understand scientific concepts and can carry out scientific processes.	• Instruction to students/trainees and assessors. • Observation checklist. • Description of competent performance.
(iii) Fault finding	Product is given to student/trainee to analyse for errors or problems. Can be written or practical.	• Assessor observation checklist. • Student/Trainee checklist with diagrams if needed).
(iv) Role-play	Students/Trainees are assigned roles and a scenario to enact potential responses to situations. Clear guidelines are required for all students/trainees. Assessor must also undertake a considered role in briefing, debriefing.	• Instruction to students/trainees and assessors. • Scenario and outline of roles and key steps or issues to be covered.

ASSESSMENT METHODS

Assessment Method	Description	Tools
(v) Project can also include work-based project. (Individual or group projects)	The subject is set by the assessor and completed over a period of time. May involve a product e.g. designing something or problem solving. The subject can relate to the learner's workplace. Group projects enable a number of students to work together on a complex problem that requires planning, research, internal discussion, and group presentation.	• Instruction to students/trainees and assessors. • Clear outline of project expectations, outcomes to be produced, timelines to be met. • Assessor checklist for making judgement.
(vi) Verbal questioning	Assessor asks questions relevant to required underpinning knowledge and contingency skills.	• List of questions or bank of questions from which assessors select questions • Corresponding answers (key aspects).
(vii) Written questions (Multiple-choice answer test)	Bank of questions set. Each question gives several optional answers. Student/Trainee is required to select the best answer to the question from choices provided	• Instruction to students/trainees and assessors. • Multiple-choice test. • Answer sheet and marking scheme.
(viii) Written questions (short-answer test)	Questions set by independent body that require one paragraph answer. Generally open questions. Administered in formal environment. No prior knowledge of tasks. Assessed independently.	• Instruction to students/trainees and assessors. • Formatted questions. • Answer sheet.
(ix) Written (Essay test)	Topic is set by assessor. Student/Trainee is required to write a descriptive response to the topic. This assesses student/trainee understanding of a subject through a written description, analysis, explanation, or summary,	• Instruction to students/trainees and assessors. • Essay question(s)/topic(s) - might be a choice.

ASSESSMENT METHODS

Assessment Method	Description	Tools
(x) Third party reports	Report from: Supervisor Manager Customers Suppliers Peers	• Instruction to students/trainees and assessors. • Template or questions for third party to answer/provide response.
(xi) Portfolio	This allows students/trainees to provide a broad portrait of their performance through collection of material that relates to the evidence requirements, e.g. examples of work, journal entries, designs, workplace documents, assembled over time.	• Instruction to students/trainees and assessors. • Checklist for inclusions or list of expected contents.

Appendix 2

IBTE
Institute of Brunei Technical Education

Sample 1: Programme Assessment Plan

PROGRAMME: HNTEC IN AGROTECHNOLOGY (VETERINARY AND LIVESTOCK MANAGEMENT)
GROUP CODE: ATS07/H/AGT/01-04 V
SEMESTER: 4
START / FINISH DATE: JANUARY 2018 –MARCH 2018
YEAR: 2016/2018

MODULE TITLE	MODULE CODE	MODULE INSTRUCTORS	ASSESSMENTS SCHEME	% WEIGHTAGE (%)
LIVESTOCK PRODUCTION AND MANAGEMENT	HAGT12V	BABAR FEROZE	Coursework: Class Test Laboratory/Practical Work: Practical Work 1 Practical Work 2	30 30 40
VETERINARY NURSING AND SURGICAL TECHNIQUES	HAGT13V	DR LIEW SHIN MIN	Coursework: Class Test Laboratory/Practical Work: Practical Work Surgical Assistant	30 30 40

An Example

UNIT/WEEKS	JANUARY				FEBRUARY				MARCH			
	1	2	3	4	5	6	7	8	9	10	11	12
LIVESTOCK PRODUCTION AND MANAGEMENT			P 1			P 2		CT				
VETERINARY NURSING AND SURGICAL TECHNIQUES						SA	P	CT				
SA = Surgical Assistant	CT = Class Test							P = Practical				

Sample 2: Module Assessment Plan
Performance Objective: **Perform Basic Measuring Techniques**
Assessment of Performance

P.O.	Performance Criteria (E.O)	Assessment Criteria	Assessment Methods & Tools
3.1 Perform basic measuring techniques	3.1.2 Perform weighing of solids using weighing balance	* Use a top loading weighing balance * Tare the mass of an empty weighing boat on the weighing balance * Transfer the solids into the weighing boat * Obtain the required mass of solids * Remove any spillage before taking the mass of the solids	Practical Performance / Practical Rubric
	3.1.3 Perform measuring of liquids using measuring glassware: - volumetric flask	* Identify the correct volumetric flask to be used * Fill the volumetric flask with distilled water to one third full * Transfer solids from a weighing boat into the volumetric flask * Close the cap of the volumetric flask and shake to dissolve the solids * Top up the content of the volumetric flask to the graduation mark with distilled water * Close the volumetric flask and invert it several times to mix the content thoroughly	Practical Performance / Practical Rubric **An Example**

Sample 3: Assessment Plan
Performance Objective: **Dispose of Waste**
Assessment of Performance

P.O.	Performance Criteria	Assessment Criteria	Assessment Methods & Tools
5.1 Dispose of waste	5.1.1 Communicate waste disposal with relevant personal	* Communicate waste disposal with relevant personnel - Verbal, written. - Face to face, over company's electronic communication system - Use correct terminologies to describe situation	Practical Performance / Observation Checklist
	5.1.2 Pack and segregate waste for disposal	* Identify waste, hazards and safety measures * Use proper handling equipment * Wear appropriate Personal Protective equipment (PPE) * Inspect condition of containers (eg leaking, corroded) * Pack waste into approved containers * Segregate to prevent incompatible mistures * Segregate waste into categories according organisational instructions	Practical Performance / Observation Checklist **An Example**

TEST PLAN (THEORY)

Programme Title: NTEC in Electronic

Module: Fundamental Electronics

Date of Approval: XX

THIS TEST PLAN MUST BE USED IN CONJUNCTION WITH THE PROGRAMME GUIDE DATED XX

Scope of Test

1. The test comprises one paper – Fundamental Electronics.
2. The paper consists of TWO Sections shown in the following format:
   Section A – 15 Multiple-choice questions
   Section B – 8 Short answer questions
3. The marks for each section are as follows:
   Section A – 60 marks. 4 marks for each question.
   Section B – 40 marks. 5 marks for each question.
4. Students must attempt all questions.
5. The table of specification for the test is given at Page 2
6. Reference must be made to the guidelines for constructing test items issued by IBTE.

Duration of Test

7. The duration for the paper is 1.5 hours

Marking Scheme

8. Answer for each question must be provided. There should be no penalty for wrong answers.
9. The score of the test accounts for 30% of the final score for the theory component, while assignments accounts for the remaining 70%.

Pass Mark and Grading System

10. The maximum possible marks attainable is 100. The pass mark for the theory component is 50%.
11. The grading system is:

Grade	Score
A* - High Distinction	90% to 100%
A - Distinction	80% to 89%
B - High Merit	70% to 79%
C - Merit	60% to 69%
D - Pass	50% to 59%
F - Fail	Below 50%

An Example

TABLE OF SPECIFICATION FOR THEORY TEST PAPER

(Fundamental Electronics)

Taxonomic level / Test Topic	Section A Multiple Choice			Section B Short Answer Questions		
	I	II	III	I	II	III
Fundamentals						
1. Atomic Theory 1.1 – 1.2	1					
2. Ohm's Law 2.1 – 2.4	1					1
3. Series & parallel Circuits 3.1 – 3.64.		1	1			
4. Voltage Dividers 4.1 – 4.3		1				
5. Power 5.1 – 5.3		1	1			
Electronic Components						
6. Resistors 6.1 – 6.3	1					1
7. Capacitors 7.1 – 7.3	1					
8. Inductors 8.1 – 8.2		1			1	1
9. Switches & Fuses 9.1 – 9.3		1			1	
AC Theory						
10. AC Circuits 10.1 – 10.5		1	2			
Semiconductors						
11. Diodes 11.1 – 11.3				1		
12. Transistors 12.1 – 12.6		1		1		1
Sub-Total	4	7	4	2	2	4
Total	**15**			**9**		

Taxonomic Level

I - Knowledge

II - Comprehension

III - Application

An Example

BLOOM'S TAXONOMY AND THE DIFFERENT LEVELS OF QUESTIONS

THE TAXONOMY OF BLOOM

As teachers/instructors/trainers, we ask questions to our learners. Not all questions are on the same level. Some questions are easy to answer where other questions may require a great deal of thinking.

Bloom (1956) has provided us with his taxonomy to assist us to compose questions on different levels of thinking. This taxonomy ranges from lower to higher levels of cognitive thinking. These levels are:

(i) Knowledge (or Remember)
(ii) Comprehension (or Understand)
(iii) Application (or Apply)
(iv) Analysis (or Analyse)
(v) Synthesis (or Create)
(vi) Evaluation (or Evaluate)

EXAMPLES OF QUESTIONS IN THE TAXONOMY

Dalton and Smith[1] (1986) provide us with the following examples:

KNOWLEDGE		
USEFUL VERBS	**SAMPLE QUESTIONS**	**POTENTIAL ACTIVITIES AND PRODUCTS**
· Tell · List · Describe · Relate · Locate · Write · Find · State · Name	· What happened after...? · How many...? · Who was it that...? · Can you name the...? · Describe what happened at...? · Who spoke to...? · Can you tell why...? · Find the meaning of...? · What is...? · Which is true or false...?	· Make a list of the main events.. · Make a timeline of events. · Make a facts chart. · Write a list of any pieces of information you can remember. · List all the .... in the story/article/reading piece. · Make a chart showing...

COMPREHENSION		
USEFUL VERBS	**SAMPLE QUESTIONS**	**POTENTIAL ACTIVITIES AND PRODUCTS**
· Explain · Interpret · Outline · Discuss · Distinguish · Predict · Restate · Translate · Compare · Describe	· Can you write in your own words...? · Can you write a brief outline...? · What do you think could of happened next...? · Who do you think...? · What was the main idea...? · Who was the key character...? · Can you distinguish between...? · What differences exist between...? · Can you provide an example of what you mean...? · Can you provide a definition for...?	· Cut out or draw pictures to show a particular event. · Illustrate what you think the main idea was. · Make a cartoon strip showing the sequence of events. · Write and perform a play based on the story. · Retell the story in your words. Paint a picture of some aspect you like. · Write a summary report of an event. · Prepare a flow chart to illustrate the sequence of events. · Make a colouring book.

APPLICATION		
USEFUL VERBS	**SAMPLE QUESTIONS**	**POTENTIAL ACTIVITIES AND PRODUCTS**
· Solve · Show · Use · Illustrate · Construct · Complete · Examine · Classify	· Do you know another instance where...? · Could this have happened in...? · Can you group by characteristics such as...? What factors would you change if...? · Can you apply the method used to some experience of your own...? · What questions would you ask of...? · From the information given, can you develop a set of instructions about...? · Would this information be useful if you had a ...?	· Construct a model to demonstrate how it will work. · Make a scrapbook about the areas of study. · Take a collection of photographs to demonstrate a particular point. · Make up a puzzle game suing the ideas from the study area. · Make a clay model of an item in the material. · Design a market strategy for your product using a known strategy as a model. · Paint a mural using the same materials. · Write a textbook about... for others.

ANALYSIS		
USEFUL VERBS	**SAMPLE QUESTIONS**	**POTENTIAL ACTIVITIES AND PRODUCTS**
· Analyse · Distinguish · Examine · Compare · Contrast · Investigate · Categorise · Identify · Explain · Separate · Advertise	· Which events could have happened...? · I ... happened, what might the ending have been? · How was this similar to...? · What was the underlying theme of...? · What do you see as other possible outcomes? · Why did ... changes occur? · Can you compare your ... with that presented in...? · Can you explain what must have happened when...? · How is ... similar to ...? · What are some of the problems of...? · Can you distinguish between...? · What were some of the motives behind...? · What was the turning point in the game? · What was the problem with...?	· Design a questionnaire to gather information. · Write a commercial to sell a new product. · Conduct an investigation to produce information to support a view. · Make a flow chart to show the critical stages. · Construct a graph to illustrate selected information. · Make a family tree showing relationships. · Put on a play about the study area. · Write a biography of the study person. · Prepare a report about the area of study. · Arrange a party. Make all the arrangements and record the steps needed. · Review a work of art in terms of form, colour and texture. · Review a film

SYNTHESIS		
USEFUL VERBS	**SAMPLE QUESTIONS**	**POTENTIAL ACTIVITIES AND PRODUCTS**
· Create · Invent · Compose · Predict · Plan · Construct · Design · Imagine · Propose · Devise · Formulate	· Can you design a ... to ...? · Why not compose a song about...? · Can you see a possible solution to...? · If you had access to all resources how would you deal with...? · Why don't you devise your own way · to deal with...? · What would happen if...? · How many ways can you...? · Can you create new and unusual uses for...? · Can you write a new recipe for a tasty dish? · Can you develop a proposal which would...	· Invent a machine to do a specific task. · Design a building to house your study. · Create a new product. Give it a name and plan a marketing campaign. · Write about your feelings in relation to... · Write a TV show, play, puppet show, role play, song or pantomime about...? · Design a record, book, or magazine cover for...? · Make up a new language code and write material suing it. · Sell an idea. · Devise a way to... · Compose a rhythm or put new words to a known melody.

EVALUATION		
USEFUL VERBS	**SAMPLE QUESTIONS**	**POTENTIAL ACTIVITIES AND PRODUCTS**
· Judge · Select · Choose · Decide · Justify · Debate · Verify · Argue · Recommend · Assess · Discuss · Rate · Prioritise · Determine	· Is there a better solution to... · Judge the value of... · Can you defend your position about...? · Do you think ... is a good or a bad thing? · How would you have handled...? · What changes to ... would you recommend? · Do you believe? · Are you a ... person? · How would you feel if...? · How effective are...? · What do you think about...?	· Prepare a list of criteria to judge a ... show. Indicate priority and ratings. · Conduct a debate about an issue of special interest. · Make a booklet about 5 rules you see as important. Convince others. · Form a panel to discuss views, e.g. "Learning at School.". · Write a letter to ... advising on changes needed at... · Write a report. · Prepare a case to present your view about...

Table of Specification (Template)

Performance Objectives	Class Hours	% of Class Hours	Number and Type of Test Items Bloom's Taxonomy Cognitive Level						Total marks
			Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation	
TOTAL									

Guidelines to complete the table of specification:

1. List down all the Performance Objectives (PO) to be assessed for the concerned test/exam.
2. List out all the class hours corresponding to each PO as stated in the endorsed MG.
3. Sum up all the class hours at the bottom of the corresponding Class Hours column.
4. Calculate the percentage of class hours for each PO as follows:

$$\% \text{ Class Hours} = \frac{\text{Class Hours for each PO}}{\text{Total Class Hours}} \times 100\%$$

5. Total % of Class Hours must be equal to 100%
6. Under the "Total" for Total Marks column, indicate the total marks for the Test, i.e. 25 or 50 or 100
7. For ISQ and NTec programmes, it is recommended that test items be limited to Lower Order Thinking Skills.
8. For HNtec programmes, the questions may cover both Higher Order Thinking Skills and Lower Order Thinking Skills.
9. The distribution of test items and types (MCQs, FIBs, SAQs, etc.) must be clearly shown.
10. An example of Table of Specification is given in Page 2

Table of Specification

Performance Objectives	Class Hours	% of Class Hours	Number and Type of Test Items Bloom's Taxonomy Cognitive Level						Total marks
			Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation	
4.1	4	22	1M, 7M, 20F	11F, 13F, 15F, 17F	10M	24S(3)			11
4.2	2	11	2M, 3M, 8M, 9M	26S(2)					6
4.3	2	11	19F	12F, 16F, 18F	14F				5
4.4	2	11	5M, 6M	4M	24S(3)				6
4.5	2	11					27s(5)		5
5.1	4	22			25S(6)	23S(5)			11
6.1	2	12					22S96)		6
TOTAL	18	100	10	10	11	8	11		50

Key:

1M: 1 – refers to Question Number
M – refers to Multiple Choice Question

1F: 1 – refers to Question Number
M – refers to Fill in the Blank Question

!S(5): 1 – refers to Question Number
S – refers to Short Answer Question
(5) – refers to Marks

An Example

Test Specification

Example of a test blueprint for a fifty-item test

Bloom's Taxonomy Cognitive Level	Skill Area 1	Skill Area 2	Skill Area 3	Skill Area 4
Application – 50%	15%	15%	10%	10%
Comprehension – 20%	7%	7%	3%	3%
Analysis – 20%	7%	7%	3%	3%
Knowledge – 10%	3.50%	3.50%	1.50%	1.50%

An Example

TABLE OF SPECIFICATION FOR THEORY TEST PAPER

(Fundamental Electronics)

Test Topic / Taxonomic level	Section A Multiple Choice			Section B Short Answer Questions		
	I	I	II	II	II	III
Fundamentals						
1. Atomic Theory 1.1 – 1.2	1					
2. Ohm's Law 2.1 – 2.4	1					1
3. Series & parallel Circuits 3.1 – 3.64.		1	1			
4. Voltage Dividers 4.1 – 4.3		1				
5. Power 5.1 – 5.3		1	1			
Electronic Components						
6. Resistors 6.1 – 6.3	1					1
7. Capacitors 7.1 – 7.3	1					
8. Inductors 8.1 – 8.2		1			1	1
9. Switches & Fuses 9.1 – 9.3		1			1	
AC Theory						
10. AC Circuits 10.1 – 10.5		1	2			
Semiconductors						
11. Diodes 11.1 – 11.3				1		
12. Transistors 12.1 – 12.6		1		1		1
Sub-Total	4	7	4	2	2	4
Total	**15**	**9**				

Keys:
Taxonomic Level
I – Knowledge
II – Comprehension
III – Application

An Example

An Example

TABLE OF SPECIFICATION (SET A)
MODULE: HUMAN PHYSIOLOGY

Appendix 5

Contents (PO)	Class Hours	% of Class Hours	Number and Types of Test Items per Taxonomy						Total Marks
			Remembering	Understanding	Applying	Analysing	Evaluating	Creating	
1.1	14	14	2 MCQ (8, 16) 5 SAQ (21a, 21b, 21e)	2 MCQ (5, 14) 3 SAQ (21c, 21d)	2 SAQ (21f)				14
1.2	4	4	1 MCQ (18)	3 SAQ (28a, 28b)					4
1.3	4	4	1 MCQ (2)	1 MCQ (11) 2 SAQ (28c)					4
2.1	6	6	2 MCQ (4, 10) 2 SAQ (23b)	2 SAQ (23a)					6
2.2	6	6	3 SAQ (23c, 23d)	3 SAQ (23e)					6
2.3	2	2	2 SAQ (23f)						2
3.1	6	6	1 MCQ (6) 1 SAQ (24c)	4 SAQ (24a, 24b)					6
4.1	8	8	4 SAQ (31a)	1 MCQ (3) 3 SAQ (31b)					8
5.1	2	2	1 MCQ (1) 1 SAQ (22a)						2
5.2	6	6	2 SAQ (22c)			4 SAQ (22b)			6

An Example

TABLE OF SPECIFICATION (SET A)
MODULE: HUMAN PHYSIOLOGY

Appendix 5

5.3	4	4		1 MCQ (13)	3 SAQ (22d)				4
6.1	2	2	2 SAQ (27a)						2
6.2	6	6	3 SAQ (27b)		3 SAQ (27c)				6
6.3	4	4	1 MCQ (20)	3 SAQ (27d)					4
7.1	6	6	2 SAQ (25a)	2 SAQ (25b)	2 SAQ (25c)				6
7.2	5	5	1 SAQ (29b)	1 MCQ (17) 3 SAQ (29a, 29c)					5
7.3	4	4	1 MCQ (12)	3 SAQ (29d)					4
8.1	6	6	2 SAQ (26a)	1 MCQ (7) 3 SAQ (26b)					6
9.1	5	5	2 MCQ (9, 15) 2 SAQ (23g)	1 MCQ (19)					5
TOTAL	100	100							100

TABLE OF SPECIFICATION FOR TEST PROJECT (MANUFACTURING)

Project Description	Scope of Test	Design Features
Machine a component on CNC machine	* CNC programming * Set up workplace * Set up cutting tools * Mill flats * Angular milling * Drilling * Precision measurement * Safety precautions	* Use mild steel raw size 50x75x100mm * Program on PC * Use standard cutting tools * Given assembly and detail drawings

TABLE OF SPECIFICATION FOR TEST PROJECT (SERVICE TASK)

Project Description	Scope of Test	Design Features
Record height and weight of patient	* Prepare patient * Prepare equipment * take height measurement * Take weight * Record measurements	* patient is about 60 tears old * Comes in wheelchair * able to stand when assisted

An Example

Guidelines for Setting Examination Question Papers

The following is intended to give guidance to instructors/trainers/assessors preparing examination question papers for assessment purposes. Please refer to the attached sample question paper for the layout (Appendix 6a).

1.0 Front Page

1.1 The front page should NOT show any questions, so that the paper can be placed on the desk face up.

1.2 The front page should state:

- Name of School
- Programme Title
- Assessment Type
- Module Title
- Day and Date of Examination
- Duration of the examination which must include the 10 minutes reading time
- Maximum marks of exam paper
- Instruction to Candidates (see Clause 1.5 below)

1.3 Margins

The margins for question papers are set as follows:

- Top - 1.0 cm
- Bottom - 2.9 cm
- Sides - 2.8 cm

1.4 Fonts

Use Arial on the front page

- 14 point bold - School and Programme Title
- 12 point bold - Assessment Type, Module Title, Day/Date, Time/Duration and Maximum Marks
- 12 point - Instruction and main text

1.5 Instructions to Candidates

- The Instructions should state the NUMBER of questions on the paper.
- The number of questions to be answered MUST also be given.
- The Instruction should state if formulae, data or extracts from books are *attached* to the question paper.
- The Instruction should also sate what materials are *provided* with the question paper and what may be taken with them into the examination room/hall.

Please note the following:

- *Attached* means the information is stapled to the back of the exam paper.
- *Provided* means that the information will not be attached to the paper but will be placed separately on the candidate's desk.
- *Available* means available on request.

If questions are to be answered on the question paper and handed in, there must be space for the candidates to write their names on the front of the paper, together with instructions to do so.

1.6 Date and Time

The date and time should be typed in the form of:

Monday, 1 May 2016

9:30 a.m. – 12:30 p.m.
(including 10 minutes reading time)

OR

Monday, 1 May 2016

2:00 p.m. – 5:00 p.m.
(including 10 minutes reading time)

2.0 Question Paper

2.1 The text

- Font Type: Times New Roman or Arial
- Font Size: 12
- Font Colour: Black
- Line spacing: Minimum single
- Instruction such as "Answer **ALL** the questions from the section", "Answer **ALL** the questions", "Answer **ANY FIVE** questions" or "Answer ***ANY THREE*** questions from this section" should be clearly written before the start of the questions for that particular section or for the questions paper 9should there be no sections).

2.1 Header

Header on question paper should state:

- On the top right hand corner – Assessment Type, e.g. Phase Test 1 or End Exam.
- On the top left hand corner – Module Title e.g. Human Physiology, Numeracy for HNTec in Information Technology.

2.2 Footer

Footer on question paper should state:

- On the bottom left hand corner – Group code, e.g. HNTEC/CTN/01, ATS07/H/PHT/02
- If there are more than 1 group, then write it as NHNTEC/CTN, HNTEC/CUL, etc.

2.3 Page Number

- All questions should begin on page two.
- Page two onwards should be numbered in the bottom right hand corner (e.g. Page 1 of 6, Page 2 of 6, etc.).
- The word "**TURN OVER**" should be typed in **BOLD** in the bottom right hand corner of every **EVEN** numbered page only, so the **TURN OVER** pages are 2, 4, 6, etc.

- Any data/formula pages included should be numbered within the sequence of the paper, and show the Module Title.
- The last page should also be marked **END OF PAPER**.

2.4 Coloured Figures / Diagrams

- The question papers to be copied in black print on white paper only. No coloured paper is to be used for printing the question paper.
- The questions papers to be photocopied back-to-back.
- Anything that needs to be in colour will need to be provided in sufficient numbers ready printed and will be placed on the desks separately.
- A note needs to be added to the Instructions stating that visual material accompanies the paper.
- Ensure that the Module Title is printed in the top right corner of any additional paper.

2.5 Splitting Questions

- The splitting of questions between pages should be avoided as far as possible, particularly at the end of even numbered pages where the page needs to be turned over.
- If a small reduction in the margins would allow the question to sit on the page and avoid an extra page being printed for just one question, please change margins or spacing for that page only. Otherwise, change the order of the questions on the paper.

2.6 Format of Questions

- Please refer to attached sample question paper (see Appendix 6a).
- The numbering of the questions must be in running order, whether the question paper is made up of one section, two sections or more than 2 sections.

3.0 Confidentiality

3.1 All staff involved in the preparation of examination papers must ensure that students/trainees are not able to see or gain access to examination questions or related materials.

3.2 There should be no student/trainee access to a room in which examination papers are being prepared. If this is not possible, care must be taken to ensure that examination materials is not visible either on paper or on a computer screen whenever students/trainees are in the room. Office should be locked up when unattended and PCs should be logged out.

3.3 Care must be taken when disposing of the earlier version or unwanted copies of examination papers. Hard copies should be destroyed by shredding.

4.0 Preparation of Examination Question Papers

4.1 The SOP for general assessment procedures for preparing examination questions papers can be referred QPD-16: Procedures for Preparation of Written Test / Examination Question Papers (see Appendix 1).

4.2 Setters who are preparing the exam papers should keep a record of the progress of each paper, including date of final version checked, signed and verified by the Vetter and Internal Verifier (PL/ML) concerned, and date delivered to the External Verifier (CBET/EAC) for approval purposes.

4.3 The Internal Verifier (PL/ML) will submit **3 SETS** of the verified Exam Question Papers, Marking Scheme, and Table of Specifications with the complete Internal Verification Form to the External Verifier (CBET/EAC) for approval purposes.

4.4 Upon approval, the CBET/EAC can print the question papers and seal in an envelope for safekeeping. The complete package will include at least one extra copy of the question papers, formulae sheet, answer booklets, and other relevant materials to be provided.

4.5 The appointed Chief Invigilator will collect the package (question papers, formulae sheet, answer booklets, and other relevant materials to be provided) from the EAC office on the day of the examination.

5.0 Amendment Sheets

5.1 If an error is spotted on a question paper after it has been printed, an amendment sheet should be prepared.

5.2 Amendment sheet must be submitted to the CBET/EAC as early as possible in sufficient numbers for it to be distributed to each candidate.

5.3 The amendment sheet should be printed on **PINK** coloured paper.

5.4 The Module Title of the paper must be included on the amendment sheet.

NOTE: Please do not leave it until the day of the exam to bring amendment sheet as some students may be sitting the exams in different venues.

IBTE
Institute of Brunei Technical Education

SCHOOL OF _____[1]

Programme Title[1]

Module Title	**Life Skills for Workplace – Applied Numeracy[2]**				
Student's Name					
Group Code				SC No	
Day/Date	**Monday, 22 May 2017[2]**				
Assessment Type	**Phase Test 1[2]**				
Maximum Mark	**100**	Passing Mark:	**50**	Mark Obtained	
Time/Duration	**8:30 a.m. – 11:10 a.m. (2 Hours 30 minutes[2])**			Conversion to 100%	

STUDENT INSTRUCTION[3]

1. Do not open until you are told to do so.
2. This paper consists of **19** pages, including the Front page and the Feedback page.
3. This paper consists of **nineteen** questions.
4. Answer **ALL** the questions in **Section A** and any **FOUR** questions in **Section B.**
5. If working is needed for any question it must be shown clearly. Omission of essential working will result in loss of marks.
6. Write in dark blue or black pen. You may use a pencil for any diagrams or graphs.
7. Show all your working and answers clearly on the question papers provided to you.
8. The marks for each question are shown in brackets at the end of the questions.
9. The Academic Board reserves the right to fail any candidate who breaches examination rules
10. Candidates are not allowed to leave the examination room during the **first 30 minutes** and the **last 30 minutes** of the examination period.
11. Any examination paper is not allowed to be removed from the examination room.

Font: [1] 14 point bold – School and Programme Title
[2] 12 point bold – Module Title, Assessment Type, Day/Date, Time/Duration & Maximum Marks
[3] 12 point – Instruction to Candidates
Spacing: Single line spacing

Unit Title (10)

Assessment type (10)

SECTION A (48 Marks)

Bold, Centered (14)

Answer **ALL** the questions in this section.

1. By applying the laws and properties of indices, simplify the given expressions.

1cm

(a) $\dfrac{10y^4}{2y^{-2}}$ [2]

1cm

(b) $\left(\sqrt[3]{k}\right)^6$ [2]

Minimum 1.5cm (sufficient space must be provided if questions are to be answered on the question paper

(c) $p^2 q^3 \times p^{-3} q^2$ [2]

2. Simplify $\left(\dfrac{1}{3}\right)^{-2}$ [2]

Shown on EVEN pages Except end page (Italic, Bold, 14)

TURN OVER

Group Code (10)

3. Evaluate $\log_5 25$ [2]

4. Evaluate $\log_2 8 + \log_2 1$ [3]

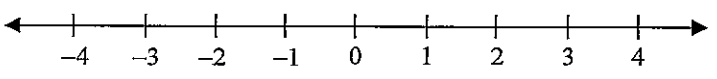
5. Express as a single logarithm:

$3\log_5 x + \log_5 y - \log_5 w$ [2]

Page Numbering (10)

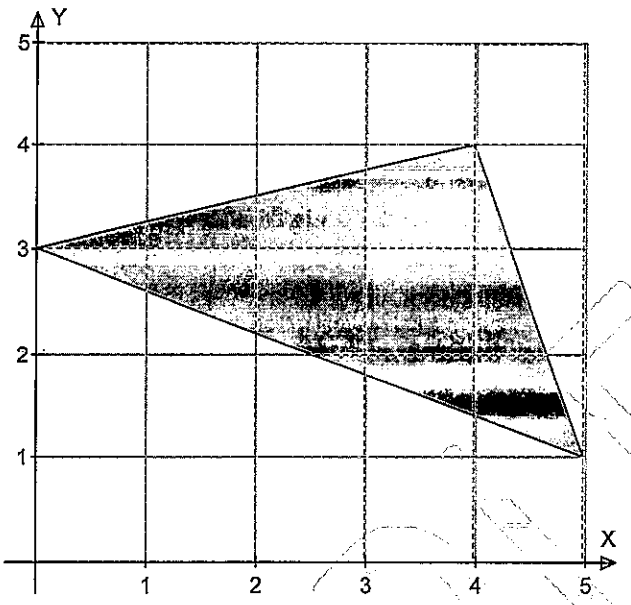
6. Solve : $\log 4 + \log(x-3) = \log(x+3)$ [4]

7. Solve the inequality $(2x-3) \geq -7$ and illustrate the solution on a number line. [3]



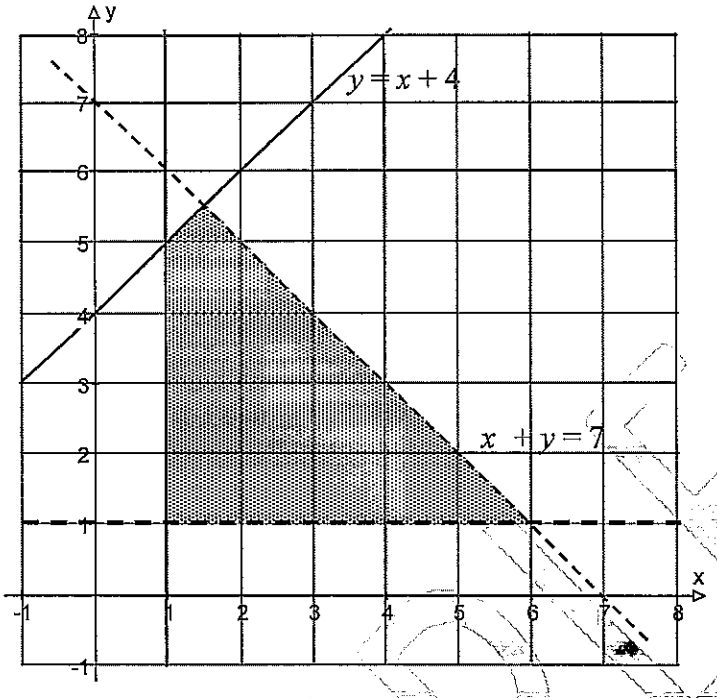
TURN OVER

8. The feasibility region for an optimization function Z is given below.



Find the maximum value of Z where $Z = 3x + 2y$. [4]

9. State the inequalities that define the shaded region below. [4]



TURN OVER

10. (a) Find the 9th term of the following arithmetic progression:

2, −1, −4, ... [3]

(b) Find the missing terms in the following arithmetic progression.

6, ..., ..., 21 [4]

(c) Find the sum of the first 6th term of the following arithmetic progression:

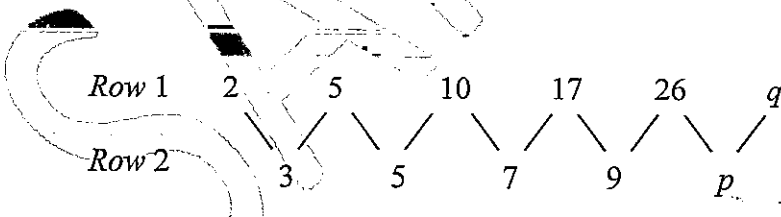
−8, −5, −2, ..., [3]

11. List the first four terms of the geometric progression whose first term is 5 and common ratio is 2. [3]

12. Find an expression, in terms of n, for the n^{th} term of the following number pattern.

8, 13, 18, 23, ... [3]

13.



(a) By considering the sequence in Row 2, write down the value of p. [1]

(b) Find the value of q. [1]

TURN OVER

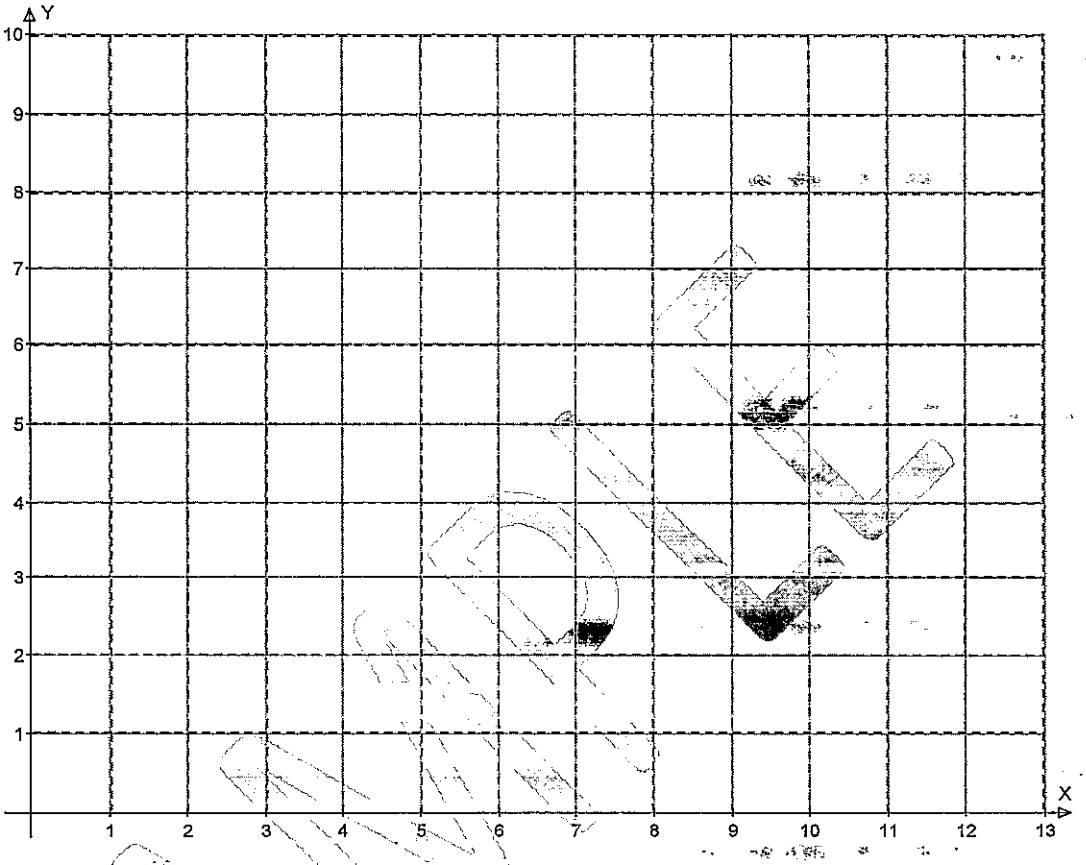
SECTION B [52 Marks]

Answer **ANY FOUR** questions in this section

14. Peter wants to buy x pieces of pen drive A and y pieces of pen drive B.
He wants to buy at least 3 pieces of pen drive A and at least 2 pieces of pen drive B.
The maximum number of pen drive he wanted to buy is 9 pieces.
Each pen drive A costs \$6 and each pen drive B costs \$12.
Peter wants to spend no more than \$72.

(a) Write down four inequalities which represent these conditions. [4]

(b) On the grid below, graph all the constraints.
Use letter ***R*** to indicate the region which satisfy all the constraints. [5]



(c) Calculate the smallest cost when Peter buys a total of 9 pieces of pen drives. [4]

TURN OVER

15. (a) The common difference of an arithmetic series is 3 and the sum of the first 10 terms is 145. Find the first term. [3]

(b) A geometrical series is given as follow:

$$75, \ldots\ldots, \ldots\ldots, \frac{3}{5}, \frac{3}{25}.$$

Find:

(i) the value of r. [2]

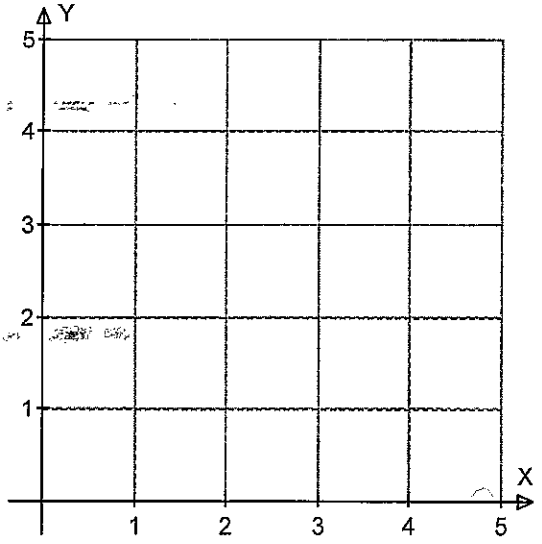
(ii) the missing terms. [4]

(iii) S_5 [2]

(iv) S_∞ [2]

TURN OVER

16. (a) On the grid below, draw the graph of $y = x + 1$ and shade the region which satisfy the condition $y \leq x + 1$. [2]



(b) Solve the given inequalities:

(i) $-2x \geq 10$ [1]

(ii) $4 - 3x < 34 + x$ [2]

(iii) $2x - 5 \leq 7x + 10 \leq 24$ [5]

(c) Find the smallest integer that satisfy the inequality $3x - 4 > 2$. [3]

TURN OVER

17. (a) Using the laws of logarithms, evaluate:

$$\frac{1}{2}\log_{10} 36 - \log_{10} 15 + 2\log_{10} 5$$ [4]

(b) Solve : $\log_4 (2x + 1) + 2 \log_4 2 = 4$ [4]

(c) Solve the indical equation $2^{7x-2} = 60$. [5]

18.

(a) (i) Simplify: $\sqrt{\frac{64}{b^4}}$ [1]

(ii) Simplify: $\sqrt[3]{8b^6}$ [2]

(b) Given that $P = 3x^2y^3$, find the value of P when $x = -3$ and $y = -2$. [2]

TURN OVER

(c) Solve:

(i) $2^x = 1$ [1]

(ii) $3^a \div 3^5 = 27$ [3]

(d) Evaluate:

(i) $\sqrt{3} \times \sqrt{27}$ [2]

(ii) $9^{\frac{3}{2}} \times 9^{\frac{1}{4}} \times 9^{\frac{1}{4}}$ [2]

19.

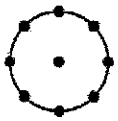


Diagram 1

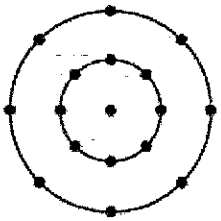


Diagram 2

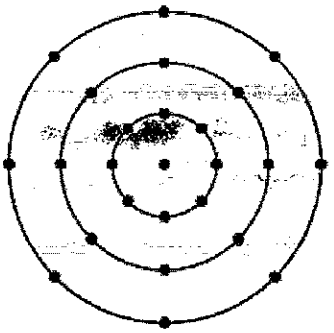


Diagram 3

The diagrams show a sequence of dots and circles.
Each diagram has one dot at the centre and 8 dots on each circle.

(a) (i) Complete the following table for Diagrams 4 and 5.

[2]

Diagram	1	2	3	4	5
Number of dots	9	17	25		

(ii) Write down, in terms of n, the number of dots in diagram n. [3]

(iii) Find n, when the number of dots in diagram n is 1097. [3]

The radius of the first circle is 1 unit.

The radius of each new circle is 1 unit greater than the radius of the previous circle.

(b) (i) Complete the following table for Diagrams 4 and 5. [2]

Diagram	1	2	3	4	5
Area of largest circle	π	4π	9π		

Write down, in terms of n and π, the area of the largest circle in

(ii) diagram *n*. [1]

(iii) diagram $3n$. [2]

End Page
Italic, Bold, Centered, 14)

END OF PAPER

FEEDBACK

TOTAL MARKS

Student Signature		**Date**	
1st Assessor's Name & Signature		**Date**	
2nd Assessor's Name & Signature		**Date**	
Internal verifier's Name & Signature		**Date**	
External Verifier's Name & Signature		**Date**	

ACTIVITY	**PERFORMANCE TEST**
TASK	**Charge Vehicle Battery**
DIRECTIONS	**Demonstrate mastery of this task by doing the following:**

This test evaluates your ability to slowOcharge a vehicle battery. You will be assigned a customer's vehicle. Clean and check the battery and slow-charge it to full charge. Write down the temperature and specific gravity *each hour*.

Caution: Have the instructor check your connections before turning on the battery charger.

No.	Your performance will be evaluated using the items below: all must be "yes"	YES	NO
1.	Were any external defects in the battery detected during inspection?	√	
2.	If needed, were cells filled?	√	
3.	Was the battery cleaned and dried?	√	
4.	Was the battery removed from the vehicle or cable clamps disconnected (ground first) before charging?	√	
5.	Was the charger switch in the OFF position before being connected to the terminals?	√	
6.	If the battery was removed, was it placed on an insulating surface?	√	
7.	Was the charger connected to battery + to + and - to -?	√	
8.	Was the charger turned on?	√	
9.	Was the charging rate appropriate for the vehicle's battery?	√	
10.	Were the temperature and specific gravity checked every hour?	√	
11.	Was the charger turned off before being disconnected?	√	
12.	Was the battery reinstalled in the vehicle securely?	√	
13.	Were the cables reconnected + to + and - to -?	√	
14.	Is the battery fully charged?	√	
15.	Will the battery start the vehicle?	√	

Student	Date	Attempt	Instructor's Signature	
Kipli Hassan	Oct 17	(1) 2 3 4	B.M. Muhd	Page 1 of 1

Source: Blank, William E., (1982) Handbook for Developing Competency-Based Training Programs

Performance Assessment: G R A S P S + R When constructing performance assessment tasks, it helps to use the acronym GRASPS + R	
Goal	Instructor: • Provides a statement of the task. • Establishes the goal, problem, challenge or obstacle in the task. The goal provides the student with the outcome of the learning experience and the contextual purpose of the experience and product creation.
Role	Instructor: • Defines the role of the students in the task. • Provides the student with the position or individual persona that they will become to accomplish the goal of the performance task. The majority of roles found within the tasks provide opportunities for students to complete real-world applications of content.
Audience	Instructor: • Identify the target audience within the context of the scenario. • The audience is the group who is interested in the findings and products that have been created. Examples audiences might include a client or committee. • These people will make a decision based upon the products and presentations created by the individual(s) assuming the role within the performance task.
Situation	Instructor: • Set the context of the scenario. • Explain the situation. Students will learn about the real-world application for the math performance task.
Product or Performance	Instructor: • Clarify what the students will need to create and why it needs to be created. This is designed using the multiple intelligences. The products provide various opportunities for students to demonstrate understanding, depending on their learning style and abilities. Based upon each individual learner and/or individual class, the educator can make appropriate instructional decisions for product development.
Standards	Instructor: • Provide a clear picture of what success looks like. • Identify specific standards for success.
Rubric	Instructor: • Develop rubrics for product or performance.

Adapted From Wiggins, Grant and Jay McTighe. Understanding by Design Professional Development Workbook. Alexandria, VA: Association for Supervision and Curriculum Development. 2004

Constructing a performance Tasks Scenario using GRASPS

Consider the following set of stem statements as you construct a scenario for a performance task. Refer to the table above to help you brainstorm possible scenarios. (Note: These are idea starters. Resist the urge to fill in all of the blanks.)

Goal :

- Your task is _____
- The goal is to _____
- The problem/challenge is _____
- The obstacle(s) to overcome is (are) _____

Role:

- You are _____
- You have been asked to _____
- Your job is _____

Audience:

- Your client(s) is (are) _____
- The target audience is _____
- You need to convince _____

Situation:

- The context you find yourself in is _____
- The challenge involves dealing with _____

Product/Performance and Purpose:

- You will create a _____ in order to _____
- You need to develop _____ so that _____

Standards & Criteria for Success:

- Your performance needs to _____
- Your work will be judged by _____
- Your product must meet the following standards _____
- A successful result will _____

Adapted From Wiggins, Grant and Jay McTighe. Understanding by Design Professional Development Workbook. Alexandria, VA: Association for Supervision and Curriculum Development. 2004

INSERT INSTITUTION LOGO	**ASSIGNMENT ASSESSMENT [Student Instruction]**		
Module Title			
Student Name		SC Number	
Group Code		Date	
Assessor Name			
Maximum Mark	400	Passing Marks	200
Duration	6 weeks		

STUDENT INSTRUCTION

1. Produce a **written report** on 'Management of Egg Production in the Farm – A Case Study of Wasan Vocational School'
2. This assignment is a combination of groupwork and individual (report writing)
3. The following guidelines should be used for the written report:
   - ❑ Font Type: Times New Roman or Arial
   - ❑ Font Size: 12
   - ❑ Font Colour: Black
   - ❑ Line spacing: 1.5
   - ❑ Pictures: Insert relevant pictures with captions
   - ❑ Page numbering
4. Submit hardcopy and softcopy of the written report electronically to my email **cikgu@moe.edu.bn** of your work by **30th September 2015**
5. The duration of the assignment is 6 weeks from 11th August 2015 – 22nd September 2015
6. You may consult your instructor whenever needed

LEARNING OUTCOMES

1. Apply the concepts of management and decision making
2. Apply the general concepts of farm management

ASSIGNMENT DETAILS

SCENARIO 1:

Students in group will be given access to the 'Layer House' of Poultry Unit of Wasan Vocational School to observe the daily operation of the school farm, and ask questions related to the management of the farm

TASK 1:

Each group will collect information and necessary evidences needed in writing a report for the management team of the Poultry Unit, Wasan Vocational School

SCENARIO 2:

Students will conduct an educational visit to one of the established farms in Brunei-Muara District, Brunei Darussalam in August 2015. There, students will learn how a large, well-established company organizes their management activities that can lead to the production of eggs in a very large quantity for consumption of people in Brunei Darussalam

TASK 2:

Each group will schedule:

1st meeting – to plan your activities before the visit

2nd meeting – to discuss the findings/outcomes identified for both visits

– to find similarities and differences between the two visits

Solutions need to be discussed during the meetings, and students are encouraged to use the decision making process flowchart taught in the Farm Management (FMG) module. Meetings and also student attendance need to be scheduled and recorded respectively.

PERFORMANCE STANDARD

1. Given access to farm enterprises, correctly apply the management concepts, and also make appropriate decisions based on the work-related problem identified

2. Given access to farm enterprises, correctly explain the meaning of farm management, and accurately interpret the range/scope of farm management activities and labour management based on current situation of the farms

GENERAL SAFETY AND BIOSECURITY FOR THE POULTRY FARM VISIT INSTRUCTIONS

1. Keep logs of all visitors that visit the poultry farm facilities, and they are required to provide information about who they are, contact information, why they are there as well as what areas they will access.
2. Visitors should not visit any animal farm at least 24 hours prior to the visit to the poultry farm.
3. Visitors must be informed of the escape routes for each section of the operation.
4. Sanitizing human hands when entering and leaving a farm is a must. Visitors should remove items such as watches and rings, which may be difficult to sanitize and may carry diseases from farm to farm.
5. Visitors are required to wear the right personal protective equipment before entering the farm facilities, such as mask, head cover, gloves, coveralls and slip-resistant safety footwear.
6. Do not entry any operation that has warning signs restricting access to the facilities.
7. Wear the earplugs to avoid exposure to high levels of noise.
8. Avoid the eyes and skin from contact with any disinfectants, detergents, pesticides, vaccines and medicines.
9. Avoid exposure to hot surfaces (for example, beak trimmers). Keep away from sources of heat and flames.
10. Do not smoke due to the flammable and combustible materials may burst into flames very suddenly.
11. Do not run in the facilities in order to avoid slip and fall.
12. Make sure visitors wear the mouth cover to avoid respiratory hazards resulting from exposure to dust, which is composed of feathers, dander, micro-organism, etc.
13. Wash your skin or eyes for at least 15 minutes if you spill any corrosive materials on them.
14. Wash your hands after your visit and before you eat and drink.

SCORING RUBRIC

Criteria	Performance Levels				Assessors			Ave.	W (%)	WP
	4 Excellent	3 Good	2 Satisfactory	1 Unsatisfactory	1	2	3			
Knowledge-Based Criteria										
1. Format of the Report (10%) The report should include the following headings: a. Introduction b. Management of farm c. Current situation d. Suggestions for improvement e. Conclusion	All of the required information are given	Only 4 of the required information are given	Only 3 of the required information are given	Only 2 or less of the required information are given					10	
2. Clarity of Information (60%) **The report describes all the necessary information on the management of egg production in school farm** **a.** Introduction should include: **i.** name of the farm **ii.** name of the owner **iii.** location of farm with contact details **iv.** total area used **v.** goals/missions of farm, and **vi.** type and system of farming	Satisfies all the required information correctly	Satisfies any 5 of the required information correctly	Satisfies any 4 of the required information correctly	Satisfies any 3 or less of the required information correctly					10	

b. Management of farm explains the following: i. organization of the farm ii. Farm management functions iii. Range of farm management activities iv. labour management related to the enterprise	Satisfies all of the required information correctly	Satisfies any 3 of the required information correctly	Satisfies any 2 of the required information correctly	Satisfies any 1 or none of the required information correctly					20	
c. Current situation includes four problems encountered in the enterprise	Present 4 actual problems	Present 3 actual problems	Present 2 actual problems	Present none or 1 actual problems					10	
d. Four suggestions for improvement using the decision-making process flowchart	Present 4 suggestions	Present 3 suggestions	Present 2 suggestions	Present none or 1 suggestion					10	
e. Conclusion includes the main points learned from study of management and decision-making: i. What students learned from the lecture ii. School farm visit iii. Commercial farm visit iv. 1st Group meeting v. 2nd Group meeting	Present any 5 points	Present any 3-4 points	Present any 2 points	None or any 1 point					10	
Skill-Based Criteria										
3. Resourceful/Practicality (10%) **Provide the following evidences:** 1) Schedule of group meetings	Any 5 evidences are provided	Any 3-4 evidences are provided	Any 2 evidences are provided	None or any 1 evidence is provided					10	

2) Attendance of group meetings 3) Questions prepared in advance before visit 4) Writing materials prepared for recording purpose 5) Minutes of meetings										
4. Visual Appeal (10%) a. Well written report b. Colourful diagrams c. Free from the use of correction fluid and strikethrough d. Correct page numbering	Any 4 evidences are provided	Any 3 evidences are provided	Any 2 evidences are provided	None or any 1 evidence is provided					10	
Attitude-Based Criteria										
5. Promptness in the Submission of Work (5%) a. Submit on 22nd September 2015 by 4.30 p.m.	Submitted on time	Submitted one day late	Submitted two days late	Submitted three days late or more					5	
6. Group Meeting Attendance (5%) a. Attend both meetings set by the group b. Punctual for all the meetings set by the group	Attended both meetings and was punctual	Attended both meetings	Attended only 1 meeting	Did not attend any meeting					5	
Final Grade									100	

ASSIGNMENT ASSESSMENT

FEEDBACK

TOTAL MARKS

Student Signature		Date	
Assessor Signature		Date	
Internal Verifier		Date	
External Verifier		Date	

INSERT INSTITUTION LOGO	**PRACTICAL ASSESSMENT [Student Instruction]**		
Module Title	Workshop Theory and Practice		
Student Name		SC Number	
Group Code		Date	
Assessor Name			
Maximum Mark	224	Passing Mark	135
Duration	4 weeks		

STUDENT INSTRUCTION

1. Read the instructions carefully
2. This assessment is to be done individually
3. You are given 15 minutes for preparation
4. You may consult your instructor whenever needed
5. At the end of this practical you will produce a step gauge according to the performance standard mentioned below

LEARNING OUTCOMES

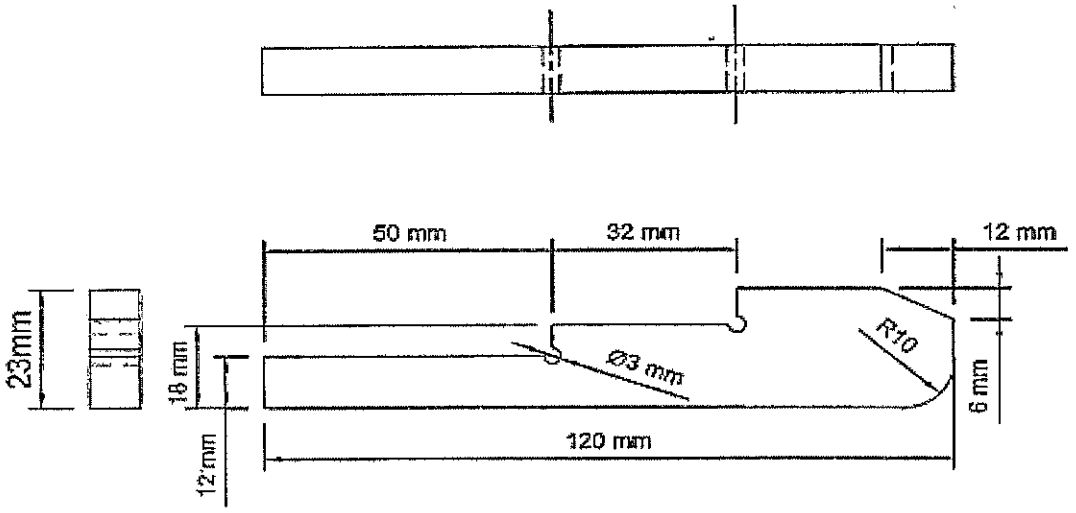
Students should be able to:

1. Apply the general workshop and machine safety
2. Use mechanical hand tools
3. Perform layout procedures
4. Cut and shape workpiece
5. Use power tools for hand held operations
6. Fit drill holding devices
7. Drill and tap holes

PRACTICAL DETAILS

Produce a step gauge as shown below:

Figure 1 Step gauge



TITLE: STEP GAUGE	MATERIAL: MILD STEEL	DATE: 2014/2015	NAME:
DRAWING	TOLERANCE: ±0.1	DIMENSIONS IN MM SCALE: NOT TO SCALE	GROUP:

PRACTICAL DETAILS

Sequence of Operations:

1. Establish the Datum Face
2. Establish the Datum edge square to Datum Face
3. File the ends square and flat
4. Mark out using the Angle plate and Vernier Height Gauge as well as 10 mm radius gauge
5. Drill two holes with drill size 3 mm
6. Saw out excess material with hacksaw leaving the marked lines visible
7. File to the lines marked
8. Check dimensions using Vernier caliper and radius gauge. Any defect, rectify by filing with a smooth file
9. Deburr and remove all sharp edges

PERFORMANCE STANDARD

- In an authentic/simulated related context:
  - ❑ Apply the general workshop and machine safety in accordance with the specified standards and practices of the industry
  - ❑ Demonstrate a thorough knowledge and understanding of the importance of selecting and using hand tools in accordance with the engineering standards and practices of the industry
  - ❑ Demonstrate a thorough knowledge and understanding of the importance of how to perform layout procedures in accordance with the engineering standards and practices of the industry
  - ❑ Demonstrate a thorough knowledge and understanding of the importance of how to cut and shape workpiece in accordance with the engineering standards and practices of the industry
  - ❑ Demonstrate a thorough knowledge and understanding of the importance of selecting and using portable power tools in accordance with the engineering standards and practices of the industry
  - ❑ Demonstrate a thorough knowledge and understanding how to fit drill holding devices in accordance with the engineering standards and practices of the industry
  - ❑ Demonstrate a thorough knowledge and understanding how to drill and tap holes in accordance with the engineering standards and practices of the industry
- The final dimensions of the product must be within the tolerance of ± 0.1 mm

Location: MME Workshop 2

Duration: 4 weeks

Start Date and Time:

Submission Date and Time:

Materials, tools and equipment:

1. Flat Steel Bar
2. Bench vice
3. Set of Files
4. Scraper
5. Drilling Machine
6. 3mm Drill Bit
7. Angle Block
8. Vernier Height Gauge
9. Vernier caliper
10. Hacksaw
11. Radius Gauge
12. Centre Punch
13. Try Square
14. Divider
15. Hammer

GENERAL PRACTICAL INSTRUCTIONS

SAFETY AT WORKPLACE

1. All candidates are required to wear the minimum PPE in work areas, such as hard hats, steel-toes shoes or boots and coveralls.

2. All candidates are required to wear safety glasses, face shields adequate for protection of the eyes, face or neck for work areas in grinding, buffing, hammering, chiseling, chipping, stenciling, cleaning with compressed air, wire brushing and handling hazardous chemical such as acids or caustics.

3. All candidates are required to wear earmuffs or earplugs in high level noise areas.

4. All candidates must wear gloves when performing work which may expose their hands to extreme temperatures, cuts, abrasion or hazardous equipment, materials and chemicals.

5. Steel-toes shoes or boots conforming to international recognized equivalent standard must be worn in all work areas.

HOUSEKEEPING

Good housekeeping helps prevent incidents and possible injuries.

The basic rules to be followed by all candidates are:

- ❑ Don't leave rubbish laying about around work area
- ❑ Keep all gangways, aisles and stairways clear from obstruction or tripping hazards
- ❑ Wipe up spilt oil, grease or liquids
- ❑ Clear up turnings, chips or off-cuts
- ❑ Ensure that all tools, equipment and supplies are stored in their proper place in a safe and tidy manner
- ❑ Stack goods and materials clear of gangways
- ❑ Keep benches and worktops uncluttered
- ❑ Don't accumulate scrap or waste
- ❑ Don't leave loose tools or running machines
- ❑ Ensure that access to fire extinguishers is not obstructed
- ❑ Keep all fire doors and exits clear of obstruction

MARKING SCHEME

Practical Details	Enabling Objectives	Evidence		Raw Marks A1	Raw Marks A2	Raw Marks Avg	Difficulty & Criticality	Maximum Possible Mark	Actual Marks
1. Establish the datum face	2.1.2 Use and construct layout work	1	The datum face is not properly created				x 3 x 1	12	
		4	The datum face is properly created						
	2.2.1 Select and use hand tools to produce desired outcomes to job specifications which may include finish, tension, size or shape	1	Only flat or smooth file is used to create the datum face				x 3 x 1	12	
		4	Flat and smooth file are used to create the datum face						
2. Establish the datum edge square to datum face	2.1.2 Use and construct layout work	1	The datum edge is not properly created				x 3 x 1	12	
		4	The datum edge is properly created						
	2.2.1 Select and use hand tools to produce desired outcomes to job specifications which may include finish, tension, size or shape	1	Only flat or smooth file is used to create the datum face				x 3 x 1	12	
		4	Flat and smooth file are used to create the datum face						

3. File the ends square and flat	2.2.1 Select and use hand tools to produce desired outcomes to job specifications which may include finish, tension, size or shape	**1**	Only flat or smooth file is used to create the datum face				x 3 x 2	24	
		4	Flat and smooth file are used to create the datum face						
4. Mark out using the Angle plate and Vernier Height Gauge as well as 10 mm radius gauge	2.1.1 Identify equipment for layout marking	**1**	None or only one equipment is identified for marking out				x 2 x 1	8	
		3	2 out of 3 are identified for marking out						
		4	All equipment are identified for marking out						
	2.1.2 Use and construct layout work	**1**	2 or less dimensions are correctly marked out				x 3 x 1	12	
		2	3 to 6 dimensions are correctly marked out						
		3	7 to 9 dimensions are correctly marked out						
		4	All dimensions are correctly marked out						

5. Drill two holes with drill size 3mm	5.2.4 Identify and select work holding devices	1	Wrong or no work holding devices is selected				x 3 x 1	12	
		4	Correct work holding devices are selected						
	5.3.3 Drill and tap holes	1	Holes are not drilled to the correct size				x 3 x 2	24	
		3	Only one hole is drilled to the correct size						
		4	Both holes are drilled to the correct size						
6. Saw out excess material with hacksaw leaving the marked lines visible	1.2.1 Identify, select and use hand tools and processes which are appropriate to the task requirements	1	Excess materials are saw out using hacksaw leaving partial or no visible marked lines				x 3 x 1	12	
		4	Excess materials are saw out using hacksaw leaving clear visible marked lines						

7. Files to the lines marked	2.2.2 Cut and shape workpiece using the appropriate hand cutting tools	1	Wrong type of files are used for roughing and finishing				x 3 x 2	24	
		3	Wrong type of file is used for either roughing or finishing						
		4	Flat file is used for roughing process and smooth file is used for finishing						
8. Check dimensions using vernier caliper and radius gauge. Any defect noticed, are rectified by filing with a smooth file	2.2.1 Select and use hand tools to produce desired outcomes to job specifications which may include finish, tension, size or shape	1	2 or less dimensions are correctly filed				x 3 x 1	12	
		2	3 to 6 dimensions are correctly filed						
		3	7 to 9 dimensions are correctly filed						
		4	All dimensions are correctly filed						
9. Deburr and remove all sharp edges	2.2.1 Select and use hand tools to produce desired outcomes to job specifications which may include finish, tension, size or shape	1	Burr or sharp edges are found in the final workpiece				x 3 x 1	12	
		3	Smooth file and scraper are used but not all burr or sharp edges are removed						
		4	Smooth file and scraper are used with no burr or shape edges found in the final workpiece						

10. Work in accordance with recognized procedures and safe working practices	1.1.1 Recognize any potential hazards in the Mechanical workshop that may result from the misuse or improper care of tools and equipment, bad housekeeping etc	1	Fail to recognize potential hazards in the Mechanical Workshop				x 3 x 1	12	
		4	Recognize all potential hazards in the mechanical workshop						
	1.1.1 Recognize any potential hazards in the Mechanical workshop that may result from the misuse or improper care of tools and equipment, bad housekeeping etc	1	Did not perform housekeeping				x 3 x 1	12	
		4	Perform housekeeping						
	3.1.3 Adhere to all safety requirements before, during and after use	1	Violation of safety when using drilling machine				x 3 x 1	12	
		4	All safety are adhered when using drilling machine						
							TOTAL MARK =	**224**	
			PERCENTAGE = $\left(\frac{\text{Actual Total Mark}}{\text{Max Possible Total Mark}}\right)\times 100$ **=**						

PRACTICAL

FEEDBACK BY ASSESSOR:

TOTAL MARKS

Student Signature		Date	
Assessor Signature		Date	
Internal Verifier		Date	
External Verifier		Date	

PRACTICAL ASSESSMENT MARKING SCHEME (for Assessor use only)

Student Name	
Student SC No	
Module Title	
Practical	
Assessor Name	

Weighted Mark Indication:

Raw Mark: Indicates the range of scores that correspond to the level of competency

Criticality: Indicates the importance of the enabling objectives assessed to be performed by the student (set by Subject-Matter Expert)

Difficulty: Indicate the depth/level of the enabling objectives assessed which correspond to the A/K/S column stated in the Module Guide (refer to Module Guide)

	Raw Mark
Not Yet Competent	1 – Unsatisfactory
Competent	2 – Satisfactory
	3 – Good
	4 – Excellent

Difficulty
1 – Awareness
2 – Knowledge
3 – Skill

Criticality
1 – Least Critical
2 – Critical
3 – Very Critical

Maximum Possible Marks = Highest Raw Mark (4 - Excellent) x Difficulty x Criticality

Actual Marks = Average of Raw Marks x Difficulty x Criticality

Key:

A1 – Assessor 1
A2 – Assessor 2
Avg - Average

MARKING SCHEME

Practical Details	Enabling Objectives	Evidence		Raw Marks A1	Raw Marks A2	Raw Marks Avg	Difficulty & Criticality	Maximum Possible Mark	Actual Marks
1. Establish the datum face	2.1.2 Use and construct layout work	1	The datum face is not properly created				x 3 x 1	12	
		4	The datum face is properly created						
	2.2.1 Select and use hand tools to produce desired outcomes to job specifications which may include finish, tension, size or shape	1	Only flat or smooth file is used to create the datum face				x 3 x 1	12	
		4	Flat and smooth file are used to create the datum face						
2. Establish the datum edge square to datum face	2.1.2 Use and construct layout work	1	The datum edge is not properly created				x 3 x 1	12	
		4	The datum edge is properly created						
	2.2.1 Select and use hand tools to produce desired outcomes to job specifications which may include finish, tension, size or shape	1	Only flat or smooth file is used to create the datum face				x 3 x 1	12	
		4	Flat and smooth file are used to create the datum face						

3. File the ends square and flat	2.2.1 Select and use hand tools to produce desired outcomes to job specifications which may include finish, tension, size or shape	**1**	Only flat or smooth file is used to create the datum face				x 3 x 2	24	
		4	Flat and smooth file are used to create the datum face						
4. Mark out using the Angle plate and Vernier Height Gauge as well as 10 mm radius gauge	2.1.1 Identify equipment for layout marking ☐ Angle plate ☐ Divider ☐ Vernier height gauge	**1**	None or only one equipment is identified for marking out				x 2 x 1	8	
		3	2 out of 3 are identified for marking out						
		4	All equipment are identified for marking out						
	2.1.2 Use and construct layout work ☐ 50 mm ☐ 32 mm ☐ 12 mm (horizontal) ☐ 120 mm ☐ 23 mm ☐ 18 mm ☐ 12 mm (vertical) ☐ 6 mm ☐ 3 mm (radius) ☐ 10 mm (radius)	**1**	2 or less dimensions are correctly marked out				x 3 x 1	12	
		2	3 to 6 dimensions are correctly marked out						
		3	7 to 9 dimensions are correctly marked out						
		4	All dimensions are correctly marked out						

5. Drill two holes with drill size 3mm	5.2.4 Identify and select work holding devices	**1**	Wrong or no work holding devices is selected				x 3 x 1	12	
		4	Correct work holding devices are selected						
	5.3.3 Drill and tap holes	**1**	Holes are not drilled to the correct size				x 3 x 2	24	
		3	Only one hole is drilled to the correct size						
		4	Both holes are drilled to the correct size						
6. Saw out excess material with hacksaw leaving the marked lines visible	1.2.1 Identify, select and use hand tools and processes which are appropriate to the task requirements	**1**	Excess materials are saw out using hacksaw leaving partial or no visible marked lines				x 3 x 1	12	
		4	Excess materials are saw out using hacksaw leaving clear visible marked lines						

7. Files to the lines marked	2.2.2 Cut and shape workpiece using the appropriate hand cutting tools	**1**	Wrong type of files are used for roughing and finishing				x 3 x 2	24	
		3	Wrong type of file is used for either roughing or finishing						
		4	Flat file is used for roughing process and smooth file is used for finishing						
8. Check dimensions using vernier caliper and radius gauge. Any defect noticed, are rectified by filing with a smooth file	2.2.1 Select and use hand tools to produce desired outcomes to job specifications which may include finish, tension, size or shape □ 50 mm □ 32 mm □ 12 mm (horizontal) □ 120 mm □ 23 mm □ 18 mm □ 12 mm (vertical) □ 6 mm □ 3 mm (radius) □ 10 mm (radius)	**1**	2 or less dimensions are correctly filed				x 3 x 1	12	
		2	3 to 6 dimensions are correctly filed						
		3	7 to 9 dimensions are correctly filed						
		4	All dimensions are correctly filed						

9. Deburr and remove all sharp edges	2.2.1 Select and use hand tools to produce desired outcomes to job specifications which may include finish, tension, size or shape	**1**	Burr or sharp edges are found in the final work piece				x 3 x 1	12	
		3	Smooth file and scraper are used but not all burr or sharp edges are removed						
		4	Smooth file and scraper are used with no burr or shape edges found in the final work piece						
10. Work in accordance with recognized procedures and safe working practices	1.1.1 Recognize any potential hazards in the Mechanical workshop that may result from the misuse or improper care of tools and equipment, bad housekeeping etc	**1**	Fail to recognize potential hazards in the Mechanical Workshop				x 3 x 1	12	
		4	Recognize all potential hazards in the mechanical workshop						

	1.1.1 Recognize any potential hazards in the Mechanical workshop that may result from the misuse or improper care of tools and equipment, bad housekeeping etc	**1**	Did not perform housekeeping				x 3 x 1	12	
		4	Perform housekeeping						
	3.1.3 Adhere to all safety requirements before, during and after use	**1**	Violation of safety when using drilling machine				x 3 x 1	12	
		4	All safety are adhered when using drilling machine						
							TOTAL MARK =	**224**	
							PERCENTAGE = $\left(\frac{\text{Actual Total Mark}}{\text{Max Possible Total Mark}}\right)\times 100$ **=**		

PRACTICAL

FEEDBACK BY ASSESSOR:

TOTAL MARKS

Student Signature		Date	
Assessor Signature		Date	
Internal Verifier		Date	
External Verifier		Date	

INSERT INSTITUTION LOGO	**LABORATORY WORK 2 ASSESSMENT [Student Instruction]**		
Module Title	Basic Laboratory Techniques		
Student Name		SC Number	
Group Code		Date	
Assessor Name			
Maximum Mark	582	Passing Mark	291
Duration	25 min (Task 1) & 1 hr (Task 2)		

STUDENT INSTRUCTION

This is the laboratory work 2 for the module Basic Laboratory Techniques. It will contribute 40% to your overall assessment. There are two main tasks in this laboratory work 2:

i. Task 1 - Perform Preparation of Solutions.

ii. Task 2 - Perform Acid-Base Titration.

All the laboratory activities will be performed individually. The duration of each task is stated in the instructions. You may consult your instructor whenever needed.

LEARNING OUTCOMES

Students should be able to:

i. Prepare standard solutions

ii. Prepare solution by dilution

iii. Perform acid-base titration

iv. Calculate the molarity and concentration of a solution

PRACTICAL DETAILS

TASK 1: PREPARATION OF SOLUTION

Many experiments involving chemicals call for their use in solution form on which, two or more substances are mixed together in known quantities. Preparing solutions accurately will improve an experiment's safety and chances for success. Solutions with accurately known concentrations can be referred to as standard (stock) solutions. These solutions can be formed by dissolving the desired amount of solute into a volumetric flask of a specific volume.

In this part of the laboratory work, you are required to prepare solutions from solids and liquid. Preparation of both solutions will be assessed within a specified time.

Preparing solution from solids

You will be provided with a weighing boat, a spatula, a top-loading balance, a dropper, a filter funnel, a bottle of distilled water and various ranges of volumetric flasks.

You are tasked to prepare a 500 mL solution containing **both** 34.8 mM $C_{12}H_{22}O_{11}$ (glucose) and 0.114 M NaCl (salt) in a volumetric flask.

Calculate, with full workings shown, the amounts of solutes required in the attached worksheet. Leave the final answer in one decimal place. Bring the worksheet together during the time of assessment for submission.

Sequence of Operations

1. Weigh the desired amount of solute and obtain a volumetric flask of appropriate volume. Rinse and dry the spatula and weighing boat used in between weighing different solute.
2. Fill the volumetric flask approximately half to two thirds full of water.
3. Add the solute to the volumetric flask through a filter funnel and rinse the weighing boat and the inside of the filter funnel into the flask to collect any remaining solute.
4. Mix both solute and water until the solute dissolves.

5. Carefully fill the flask to the mark etched on the neck of the flask. Use a wash bottle or dropper if necessary.
6. Mix the solution thoroughly by stoppering the flask securely and inverting it a few times.

Preparing solution by liquid dilution

You will be provided with two bottles of different concentrated solutions, a dropper, a filter funnel, a pipette bulb, a bottle of distilled water and various ranges of graduated pipettes, measuring cylinders and volumetric flasks.

You are tasked to prepare a dilution of two concentrated solutions.

1. Prepare 0.1 L of 0.076 M $CoCl_2$ from 217 mM $CoCl_2$
2. Prepare 250 mL of 41.6 mM $KMnO_4$ from 0.113 M $KMnO_4$

Calculate, with full workings shown, the volume of solution and water required in the attached worksheet. Leave the final answer in one decimal place. Bring the worksheet together during the time of assessment for submission.

Sequence of Operations

1. Measure the desired volume from the solutions provided using the most accurate measuring glassware for the specified amount of interest.
2. Fill in the collected solution into an empty volumetric flask. Swirl the measuring glassware (except pipettes) with some distilled water to collect any remaining solution into the flask.
3. Carefully fill the flask to the mark etched on the neck of the flask. Use a wash bottle or dropper if necessary.
4. Mix the solution thoroughly by stoppering the flask securely and inverting it a few times.

You are given **25 minutes** to finish preparing all 3 solutions in Task 1.

TASK 2: ACID-BASE TITRATION

Titration is a method of analysis in which the concentration of a solution with a

known volume can be determined from the reaction between this solution and another solution of known concentration and volume. One of the titrations that are commonly performed in the laboratory is acid-base titration.

In an acid-base titration, the acid and base neutralize each other and cause a pH change in the solution. The pH change is indicated by a change in colour when a pH indicator is used.

You are going perform acid base titration to find out the concentration of a hydrochloric acid, using 0.05 M borax solution. You will have to prepare the borax solution before proceeding with the titration.

Sequence of Operations (Preparation of Borax Solution)

1. Calculation of Borax solution
2. Weigh out accurately _____ g of Borax (from your calculations above).
3. Dissolve in distilled water and make up to 250 cm^3 in graduated flask.

Sequence of Operations (Titration)

1. Set burette in its stand, check that it is vertical and that the tap if off. If the burette is damp, rinse out with distilled water first then with the solution that is to be used.
2. Adjust the burette so that the tip is about 25cm from the bench top.
3. Clean the pipette as well by rinsing with distilled water followed by solution that is to be used.
4. Using a funnel slightly overfill the burette with the acid.
5. Place a white tile under the burette and then pipette 4 x 25.0 cm^3 aliquots of your standard Borax solution in a clean conical flask. Add 2 or 3 drops of methyl orange indicator.
6. Adjust burette height until the tip is just level with the top of the conical flask
7. Using the 'left' hand turn-right hand shake technique add the acid from the burette, while shaking the flask. Stop at the first permanent indicator colour change. Look through the flask onto the tile so as to observe this change. Do not look at the burette while titrating.
8. Repeat the titration, but now:
    - Only refilling the burette if the titre was more than 24.0 cm^3

- Adding the acid more quickly at first, then drop by drop when within 2 cm^3 of previous titre.

9. Repeat until at least 2 consistent titres have been obtained, to within 0.1 – 0.2 cm^3 of each other.
10. Ignoring your rough titre, determine the mean titre and calculate the molarity of the acid.
11. After the titration, complete the practical worksheet provided and submit the completed worksheet to your assessor.

You are given **one hour** to finish both the titration practical and answering the practical worksheet.

PERFORMANCE STANDARD

i. Given a set of instruction and an access to a laboratory, perform preparation of solutions within a specified time.
ii. Given a set of instruction and an access to a laboratory, perform basic chemical tests within the specified time.

Location: General Science Laboratory & Chemistry Laboratory 2

Duration: 1 hour 25 mins (25 mins for Task 1, 1 hour for Task 2)

Start Date: 6 November 2017

Submission Date: 25 November 2017

Materials, tools and equipment:

- 50 mL Burette
- 25 mL Bulb pipette
- 250 mL Conical flasks
- White tile
- 250 mL beakers
- Small glass filter funnel
- Boss and clamp
- Retort stand

- Dropper
- Pipette filler/bulb
- Filter funnel
- Graduated pipette (1 mL, 10 mL)
- Volumetric flasks (100 mL, 250 mL, 500 mL, 1000 mL)
- Measuring cylinders (10 mL, 50 mL, 100 mL, 250 mL, 500 mL)
- Weighing boat
- Spatula
- Top-loading balance

GENERAL PRACTICAL INSTRUCTIONS

1. **Before each practical class:**

- Read the relevant pages for your practical.
- Think about making notes and a plan of action.
- Ensure you know the potential hazards.
- If you are unsure of any procedures, make a note of any questions you want to ask.

2. **On Practical day:**

- Bring your lab coat.
- Wait outside the lab until you are asked to enter.
- Place your bags as indicated by the instructor-in-charge.
- Ensure lab coats are fastened and safety specs (if necessary) are worn at all times.
- Eating and drinking in the laboratory is strictly forbidden.
- Latex gloves or others that are appropriate should be worn throughout the practical. If you have an allergy to latex, please inform the demonstrator-in-charge or laboratory technicians immediately to allow a non-latex glove to be given.
- Do not start your practical until you are told to do so – it may be necessary to listen to an information session from the instructor / demonstrator-in-charge prior to starting.

- Any breakage of glassware has to be reported to the demonstrator-in-charge or laboratory technicians immediately.
- Unauthorised mobile phone use is prohibited during practical session.

3. Breakages:

- Ensure that you switch off any equipment that needs switching off.
- Make sure that any waste chemicals have been disposed of correctly.
- Rinse out all glassware and remove any labels before placing on the trolley provided.
- Workbench must be cleaned and all waste dispose of by end of session.

4. Laboratory Safety

- IBTE ATC laboratories are equipped and run so that with appropriate care, you can work without risking the health and safety of yourself and others. Accidents are unexpected or undesirable events, but they are avoidable with due care and attention.

YOU HAVE A DUTY TO WORK IN A WAY THAT WILL NOT HARM THE HEALTH AND SAFETY OF YOURSELF AND/OR OTHERS

- All containers in the laboratory are labelled with their relevant hazards and any equipment that may present a hazard or needs instruction before use (or should only be operated by trained members of staff) will carry clear notices.
- LOW HAZARD chemicals can be hazardous if misused. HAZARDOUS chemicals require careful handling at all times because of one or more of the following characteristics:
    (a) Flammability
    (b) Explosive nature
    (c) Toxic, hazardous, irritant, etc.
        a. With effects on or through the skin
        b. With effects on or through the respiratory tract
        c. With effects on or through the eye
        d. With effects following ingestion

(d) Reactive with water

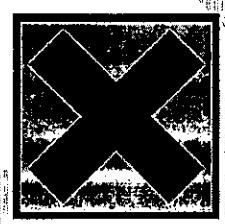
(e) Reactive with air

(f) Detrimental effect on the environment – especially to aquatic life

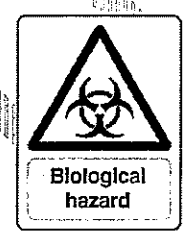
5. Hazardous chemicals carry a pictogram indicating the type of danger.

Toxic

Corrosive



Harmful Irritant



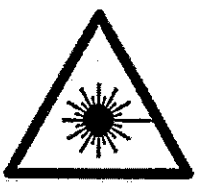
Irritant Oxidising

- Ensure that you know how to deal with any spillage ***BEFORE*** you embark on an experiment. Risk is associated with glassware, electrical, mechanical and high/low pressure apparatus.

- Do not ignore the warning signs displayed in the School. They are there for your protection.

i. Prohibitory Signs: e.g. "No smoking", are circular with a red border and crossbar over a black symbol on a white background.

ii. ***Warning Signs:*** e.g. "Caution, risk of ionising radiation", are triangular with a black border on a yellow background.



Laser Light

Risk of Ionising Radiation

iii. ***Mandatory Signs:*** e.g. "Eye Protection", are circular on a blue background with symbols in white; used when there is an obligation to wear safety equipment.

iv. ***Emergency Signs:*** e.g. "Emergency Showers", square or rectangular, on a green background with symbols in white.

6. Fire Fighting equipments, First Aid Equipments and Fire Exits

Know where the fire fighting, first-aid equipment, eyewash and emergency showers are situated. Ensure that you know the location of fire exits

7. **In the event of a FIRE ALARM or an EMERGENCY EVACUATION:**

I. Turn off all your equipment as you leave the laboratory and reassemble at the student's and visitors parking lot.

ENSURE THAT YOU READ THE PRACTICAL INSTRUCTIONS BEFORE AND DURING THE PRACTICAL CLASS, LISTEN TO INSTRUCTIONS FROM STAFF AND WATCH CAREFULLY ANY DEMONSTRATIONS OF EXPERIMENTAL PROCEDURES

REMEMBER:

Any mishap with a chemical (or apparatus) MUST be reported to a member of staff IMMEDIATELY so that they can deal with the problem and remove any hazards correctly.

ASSESSMENT MARKING SCHEME

Practical Details/ Performance Objectives	Enabling Objectives	Maximum Possible Marks
1.Perform preparation of solution from solids	3.2.2.2.1. Prepare solutions: Stock / Standard solution	**132**
2. Perform preparation of solution by dilution	3.2.2.2.1.1 Prepare solutions: Single dilution	**132**
3. Safe handling of chemicals and glassware	3.2.2 Prepare solutions	**36**
4. Perform basic chemical tests	3.3.1 Perform acid-base titration	**192**
5. Safe handling of chemicals and glassware	3.3.1 Perform acid-base titration	**36**
6. Calculation of molarity and concentration	3.3.1 Perform acid-base titration	**24**
TOTAL POSSIBLE MARKS		**552**

PRACTICAL WORKSHEET

QUESTION NO	MAXIMUM POSSIBLE MARK
1	2
2	12
3	3
4	4
5	9
TOTAL	**30**

LABORATORY WORK 2 ASSESSMENT MARKING SCHEME

Student Name	:
Student SC No	:
Module Title	: **Basic Laboratory Techniques**
Practical	: **Laboratory Work 2**
Assessor Name	:

Weighted Mark Indication:

Raw Mark: Indicates the range of scores that correspond to the level of competency

Criticality: Indicates the importance of the enabling objectives assessed to be performed by the student (set by Subject-Matter Expert)

Difficulty: Indicate the depth/level of the enabling objectives assessed which correspond to the A/K/S column stated in the Module Guide (refer to Module Guide)

	Raw Mark
Not Yet Competent	1 – Unsatisfactory
Competent	2 – Satisfactory
	3 – Good
	4 – Excellent

Criticality
1 – Least Critical
2 – Critical
3 – Very Critical

Difficulty
1 – Awareness
2 – Knowledge
3 – Skill

MARKING SCHEME

TASK 1: PREPARATION OF SOLUTION

Practical Details	Enabling Objectives		Evidence	[(Raw Marks) X (Difficulty) X (Criticality)]	Maximum Possible Mark	Actual Marks
1. Perform preparation of solution from solids	3.2.2.2.1. Prepare solutions: Stock / Standard solution	1	Student does not get the correct answer due to error in their working (such as no conversion of unit)	[(__) x (3) x (2)]	24	
		2	Student does not get the correct answer but shows the correct working			
		3	Student gets the correct answer but does not show a clear working OR no unit is included in their answer			
		4	Student gets the correct answer with unit included and shows a clear working			
	3.2.2.2.1. Prepare solutions: Stock / Standard solution	1	Student does not follow the proper procedure of using a weighing balance	[(__) x (2) x (3)]	24	
		2	Student performs the weighing procedure correctly with occasional guidance but with some spillage			
		3	Student performs the weighing procedure correctly without any spillage but with occasional guidance			
		4	Student performs the weighing procedure correctly and independently without any spillage			

	3.2.2.2.1. Prepare solutions: Stock / Standard solution	1	Student does not rinse the spatula in between weighing different solutes	[(__) x (1) x (3)]	12	
		2	Student rinse and but does not dry BOTH weighing boat and spatula in between weighing different solutes			
		3	Student rinse but does not dry EITHER weighing boat or spatula in between weighing different solutes			
		4	Student rinse and dry both weighing boat and spatula in between weighing different solutes			
	3.2.2.2.1. Prepare solutions: Stock / Standard solution	1	Student does not add water before transferring the solute OR student spills some of the solute outside of the flask OR student rinse the spatula into the flask	[(__) x (3) x (3)]	36	
		2	Student adds adequate amount of water before transferring the total amount of solute but does not rinse the weighing boat AND filter funnel			
		3	Student adds adequate amount of water before transferring the total amount of solute but does not rinse the weighing boat OR filter funnel			
		4	Student adds adequate amount of water before transferring the total amount of solute by rinsing the weighing boat and filter funnel			

	3.2.2.2.1. Prepare solutions: Stock / Standard solution	1	Student overshoots the mark of the fixed volume	[(___) x (3) x (3)]	36	
		2	Student does not mix the solution before adding more water to the correct meniscus level with some guidance			
		3	Student mixes the solution before adding more water to the correct meniscus level with some guidance			
		4	Student mixes the solution before adding more water to the correct meniscus level independently			
2. Perform preparation of solution by dilution	3.2.2.2.1.1 Prepare solutions: Single dilution	1	Student does not get the correct answer due to error in their working (such as no conversion of unit)	[(___) x (3) x (2)]	24	
		2	Student does not get the correct answer but shows the correct working			
		3	Student gets the correct answer but does not show a clear working OR no unit is included in their answer			
		4	Student gets the correct answer with unit and shows a clear working			

	3.2.2.2.1.1 Prepare solutions: Single dilution	1	Student uses the glassware that has a lower rate of accurate measurement and does not read the meniscus level correctly	[(__) x (2) x (3)]	24	
		2	Student uses the glassware that has a lower rate of accurate measurement but reads the meniscus level correctly			
		3	Student uses the glassware that has a higher rate of accurate measurement but does not read the meniscus level correctly			
		4	Student uses the glassware that has a higher rate of accurate measurement and reads the meniscus level correctly			
	3.2.2.2.1.1 Prepare solutions: Single dilution	1	Student spill some of the solution outside of the flask	[(__) x (3) x (3)]	36	
		2	Student pours the solution into a flask containing water without repeated washing of the glassware or spillage			
		3	Student pours the solution into an empty flask without repeated washing of the glassware or spillage			
		4	Student pours the solution into an empty flask with repeated washing of the glassware and without spillage			

	3.2.2.2.1.1 Prepare solutions: Single dilution	1	Student overshoots the mark etched on the flask	[(__) x (3) x (3)]	36	
		2	Student adds more water but solution reaches slightly below the meniscus level			
		3	Student adds more water to the correct meniscus level but does not mix the solution			
		4	Student adds more water to the correct meniscus level and mix by inverting the flask			
	3.2.2. Prepare solutions	1	Finishes preparing all solutions over 25 minutes	[(__) x (3) x (1)]	12	
		2	Finishes preparing all solutions within 20 – 25 minutes			
		3	Finishes preparing all solutions within 15 – 20 minutes			
		4	Finishes preparing all solutions in less than 15 minutes			
3. Safe handling of chemicals and glassware	3.2.2 Prepare solutions	1	Needs to be motivated and does not observe safety precaution in work	[(__) x (3) x (3)]	36	
		2	Self-motivated and observes sometimes some of the safety precaution in work			
		3	Self-motivated and observes most safety precautions most of the time in work			
		4	Highly self-motivated and observes all safety precautions all the time			

TASK 2: ACID-BASE TITRATION

4. Perform basic chemical tests	3.3.1 Perform acid-base titration	**1**	Student does not clean and rinse the burette and pipette before use.	[(__) x (1) x (3)]	12	
		2	Student cleans the burette and pipette but does not rinse the glassware with distilled water and solutions to be used.			
		3	Student cleans the burette and pipette and rinse the glassware with distilled water only.			
		4	Student cleans the burette and pipette and rinse the glassware, first with distilled water, and then followed with solutions to be used.			
	3.3.1 Perform acid-base titration	**1**	Student is not able to prepare the 0.05M Borax solution on his/her own.	[(__) x (3) x (3)]	36	
		2	Student is able to prepare the 0.05M Borax solution correctly with some help from the assessor.			
		4	Student is able to prepare the 0.05M Borax solution correctly and independently.			

	3.3.1 Perform acid-base titration	**1**	Student is not able to set up for the titration practical correctly (titrant in the conical flask and analyte in the burette) or requires the help from the assessor to set up for the practical.	[(__) x (2) x (3)]	24	
		2	Student is able to set up for the titration practical correctly with some help from the assessor.			
		4	Student is able to set up for the titration practical correctly without any help from the assessor.			
	3.3.1 Perform acid-base titration	**1**	Student requires help from the assessor all the time to use the burette and pipette correctly.	[(__) x (2) x (3)]	24	
		2	Student requires some help from the assessor to use the burette and pipette correctly.			
		4	Student demonstrates the correct techniques in using both burette and pipette confidently, without any help from the assessor.			

	3.3.1 Perform acid-base titration	1	Student is not able to perform the titration procedure or requires help from the assessor to titrate the solution all the time.	[(__) x (3) x (3)]	36	
		2	Student is able to perform the titration procedure with some assistance from the assessor.			
		3	Student is able to perform the titration procedure correctly by referring to the instructions given in the frontsheet only.			
		4	Student is able to perform the titration procedure correctly, without having the needs to refer to the instructions given in the frontsheet or assistance from the accessor.			
		1	Student is not able to identify the end point in all titrations.	[(__) x (3) x (3)]	36	
		2	Student is able to identify the end point in half of the titrations.			
		3	Student is able to identify the end point in most titrations.			
		4	Student is able to identify the end point in all titrations.			

	3.3.1 Perform acid-base titration	1	Student does not discard the remaining solution or clean the glassware after use.	[(__) x (1) x (3)]	12	
		2	Student discards the solution according to instructions and clean all the glassware with tap water only.			
		3	Student discards the solutions according to instruction and cleans all the glassware with tap water, and rinse with distilled water.			
		4	Student discards the solutions according to instructions and cleans all the glassware with tap water, rinse them with distilled water and wipe the bench with wet cloth/paper towels before leaving the work station.			
	3.3.1 Perform acid-base titration	1	Finished the practical work beyond 60 minutes.	[(__) x (3) x (1)]	12	
		2	Finished the practical work between 45 – 60 minutes.			
		3	Finished the practical work in 45 minutes.			
		4	Finished the practical work in less than 45 minutes.			

5. Safe handling of chemicals and glassware	3.3.1 Perform acid-base titration	1	Needs to be motivated and does not observe safety precaution in work	[(__) x (3) x (3)]	36	
		2	Self-motivated and observes sometimes some of the safety precaution in work			
		3	Self-motivated and observes most safety precautions most of the time in work			
		4	Highly self-motivated and observes all safety precautions all the time			
6. Calculation of molarity and concentration	3.3.1 Perform acid-base titration	1	Student is not able to do the calculations on his/her own.	[(__) x (3) x (2)]	24	
		2	Student is able to do half of the calculations independently.			
		3	Students is able to do most of the calculations independently.			
		4	Student is able to do all the calculations independently.			
				PRACTICAL WORKSHEET	**30**	
				TOTAL MARK =	**582**	
				PERCENTAGE = $\left(\frac{\text{Actual Total Mark}}{\text{Max Possible Total Mark}}\right)\times 100$ **=**		

LABORATORY WORK 2

FEEDBACK BY ASSESSOR:

TOTAL MARKS
582

Student Signature		Date	
Assessor Signature		Date	
Internal Verifier		Date	
External Verifier		Date	

INSERT INSTITUTION LOGO	**LABORATORY WORK 2 ASSESSMENT [PRACTICAL WORKSHEET]**		
Module Title	Basic Laboratory Techniques		
Student Name		SC Number	
Group Code	ATS07/H/AGT/_____	Date	
Maximum Mark	-	Obtained Mark	-
Assessor Name			

TASK 1 – PREPARE SOLUTIONS

1. Given that the atomic mass of H = 1.01, C = 12.01, O = 16.00, Na = 22.99 and Cl = 35.35, calculate the amount of $C_{12}H_{22}O_{11}$ (glucose) and NaCl (salt) needed to prepare a 500 mL solution containing both 34.8 mM $C_{12}H_{22}O_{11}$ and 0.114 M NaCl.
   (Leave your answer to 1 decimal place)

Amount of $C_{12}H_{22}O_{11}$ = _____

Amount of NaCl = _____

2. Prepare 0.1 L of 0.076 M $CoCl_2$ from 217 mM $CoCl_2$.
   (Leave your answers as whole number)

Volume collected from _____ $CoCl_2$ = _____

Volume of water added = _____

INSERT INSTITUTION LOGO

LABORATORY WORK 2 ASSESSMENT
[PRACTICAL WORKSHEET]
(Marking Scheme for Assessor use only)

Module Title	Basic Laboratory Techniques		
Student Name		SC Number	
Group Code		Date	
Maximum Mark	-	Obtained Mark	-
Assessor Name	Nur Nazurah Hj Muhd Alizul		

TASK 1 – PREPARE SOLUTIONS

1. Given that the atomic mass of H = 1.01, C = 12.01, O = 16.00, Na = 22.99 and Cl = 35.35, calculate the amount of $C_{12}H_{22}O_{11}$ (glucose) and NaCl (salt) needed to prepare a 500 mL solution containing both 34.8 mM $C_{12}H_{22}O_{11}$ and 0.114 M NaCl.

   Grams of $C_{12}H_{22}O_{11}$ = [(12x12.01) + (22x1.01) + (11x16.00)] x 0.0348 M x 0.5 L

   = [(144.12 + 22.22 + 176.00)] x 0.0348 M x 0.5 L

   = 6.0 g

   Grams of NaCl = [(22.99 + 35.35)] x 0.114 M x 0.5 L

   = 3.3 g

   Amount of $C_{12}H_{22}O_{11}$ = **6.0 g**

   Amount of NaCl = **3.3 g**

2. Prepare 0.1 L of 0.076 M $CoCl_2$ from 217 mM $CoCl_2$.

   C1 x V1 = C2 x V2

   0.217 M x V1 = 0.076 M x 0.1 L

   V1 = 0.076 M x 0.1 L / 0.217 M

   V1 = 0.035 L

   Water added = 0.1 L – 0.035 L

   = 0.065 L

   Volume collected from **217 mM** $CoCl_2$ = **0.035 L / 35 mL**

   Volume of water added = **0.065 L / 65 mL**

3. Prepare 250 mL of 41.6 mM $KMnO_4$ from 0.113 M $KMnO_4$.

C1 x V1 = C2 x V2

0.113 M x V1 = 0.0416 M x 0.25 L

V1 = 0.0416 M x 0.25 L / 0.113 M

V1 = 0.092 L

Water added = 0.25 L – 0.092 L

= 0.158 L

Volume collected from **0.113 M** $KMnO_4$ = **0.092 L / 92 mL**

Volume of water added = **0.158 L / 158 mL**

INSERT INSTITUTION LOGO	**LABORATORY WORK 2 ASSESSMENT [PRACTICAL WORKSHEET]**		
Module Title	Basic Laboratory Techniques		
Student Name		SC Number	
Group Code		Date	
Maximum Mark	30	Obtained Mark	
Assessor Name	Jocelyn Sia Yong Wei		

TASK 2 – ACID-BASE TITRATION

1. Give the amount of Borax used to prepare 0.05 M of borax solution. [2]

2. Record the titration volume of hydrochloric acid, up to 1 decimal place. [12]

	Rough	1st titration	2nd titration	3rd titration
Final reading (cm^3)				
Initial reading (cm^3)				
Titre volume (cm^3)				

3. Calculate the mean volume of hydrochloric acid used in the titration, up to 1 decimal place. [3]

INSERT INSTITUTION LOGO	**LABORATORY WORK 2 ASSESSMENT [PRACTICAL WORKSHEET] (Marking Scheme for Assessor use only)**		
Module Title	Basic Laboratory Techniques		
Student Name		SC Number	
Group Code		Date	
Maximum Mark	30	Obtained Mark	
Assessor Name	Jocelyn Sia Yong Wei		

TASK 2 – ACID-BASE TITRATION

1. Give the amount of Borax used to prepare 0.05 M of borax solution. [2]

   4.7 – 4.8 g

   [1 mark for correct value, 1 mark for correct unit]

2. Record the titration volume of hydrochloric acid. [12]

	Rough	1st titration	2nd titration	3rd titration
Final reading (cm^3)				
Initial reading (cm^3)				
Titre volume (cm^3)				

3. Calculate the mean volume of hydrochloric acid used in the titration. [3]

   [1 mark for correct calculation, 1 mark for correct value, 1 mark for correct unit]

4. Write down the balanced chemical equation for the reaction between hydrochloric acid and borax. [4]

   $Na_2B_4O_7.10H_2O + 2\ HCl \rightarrow 2\ NaCl + 4\ H_3BO_3 + 5\ H_2O$

   [2 marks for reactants, 2 marks for products]

5. Calculate the molarity (in mol/dm^3) of the sodium hydroxide as well as the concentration (in g/dm^3). [9]

Mark	Evidence
1	Correct mole ratio between reactants
1	Correct number of mole of borax
1	Correct number of mole of HCl
1	Correct molarity of HCl
1	Correct molecular mass for HCl
1	Correct concentration of HCl
1	Correct unit for molarity
1	Correct unit for concentration
1	Correct conversion of unit (cm^3 to dm^3)

LABORATORY REPORT 2
[Student Instruction]

Module Title	**HUMAN PHYSIOLOGY**		
Student Name		SC Number	
Group Code		Date	
Assessor Name	SIA YONG WEI @ JOCELYN		
Maximum Mark	400	Passing Mark	200
Duration	2 WEEKS		

STUDENT INSTRUCTION

1. This laboratory report will contribute 35% to the overall assessment for the unit Human physiology.
2. Read the instructions carefully.
3. The laboratory work will be conducted in a group of 2-3 students.
4. At the end of this assessment, you are required to submit an individual laboratory report to account for the laboratory work.

LEARNING OUTCOMES

Students should be able to:

1. correctly identify 'stimulus' and 'response'.
2. calculate the reaction time between stimulus and response.
3. write a laboratory report.

PRACTICAL DETAILS

Reaction Time between Stimulus and Response

The human nervous system enables a person to detect a stimulus, process the information and give an appropriate response to the stimulus. The speed of reaction plays an important role in everyday life. It allows a person to react quickly, which usually comes with a reward. In some cases, slow response may come with a consequences. A response, or reaction, is different from reflexes, in which a reflex is involuntary.

Reaction time is a measure of the quickness a person responds to a particular stimulus. In other words, it measures the time taken between a stimulus occurring and the person involved making a response. It can give an indication on how quickly the neurons move in the nervous system.

In this laboratory work, you are going to investigate your reaction time, using a 50-cm ruler. You will require the help of a partner to complete Task 1, and two partners to complete Task 2. In addition, you are going to find out the impacts of distractions, gender and types of cues on the reaction time.

After completion, the recorded reaction times of the whole class will be pooled to determine the impacts of those aforementioned factors on the reaction time. You are then required to write a laboratory report to account for the experiment, using the class result.

Procedure

Task 1: Reaction time

i. Sit at a table with your dominant hand over the edge. Extend your thumb and index finger so they are about 8 cm apart.
ii. Have a partner holds a ruler, vertically, at the 50 cm mark so that the 0 cm end is exactly even within your extended thumb and index finger.

iii. You are required to grab the ruler as fast as possible, when your partner releases the ruler. Your partner should not give any hint that he/she is releasing the ruler.
iv. Record the centimeter mark where your thumb and index finger hold.
v. Repeat the experiment at least three more times. Then switch places with your partner and redo Task 1.

Task 2: Factors Affecting Reaction Time

Factor 1: Distraction

Repeat Task 1, but this time with a distraction. Each person will decide the type of distraction for your own experiment.

Factor 2: Gender

Compare the mean reaction times between the boys and the girls in the class (Results from Task 1).

Factor 3: Types of cues (auditory vs visual)

i. Begin exactly the same as Step i and ii as in Task 1.
ii. Determine a particular word (eg. 'catch') and a particular hand gesture (eg. pointing to the right) as the signals to catch the dropped ruler.
iii. For auditory cue, the partner will use a variety of words before dropping the ruler; ignore ruler catches on wrong word. Record the centimeter mark where your thumb and index finger hold.
iv. For visual cue, the partner will show a variety of hand gestures (with the hand not holding the ruler) before dropping the ruler; ignore ruler catches on wrong gestures. Record the centimeter mark where your thumb and index finger hold.
v. Record the centimeter mark where your thumb and index finger hold each time.
vi. Repeat the experiment for each type of cue at least three more times.
vii. Compare the results between the auditory and the visual cues.

After completing Task 1 and 2, you are required to calculate your reaction time (**t**) using the formula below:

$Y = ½ g_0 t^2$

where Y = the distance you measured in centimeters

g_0 = the acceleration due to gravity constant (980 cm/sec^2)

t = time in seconds

At the end of the experiment, collect and compile the data from the whole class and use this data in your laboratory report.

PERFORMANCE STANDARD

Given a set of information:

- describe clearly how the nervous system works.

The final laboratory report will consist of:

- Table of Content
- Abstract
  - The main aims of the practical
  - Brief description of the methodology
  - Overall result of the experiment
  - Final conclusion of the result
- Introduction
  - Anatomy of the nervous system, including neuron and synapse
  - Description on how information is transmitted in the nervous system
  - Description of reaction time and factors affecting it
  - Aims of the practical
- Materials and Method
  - List of materials used
  - Design of the experiment
  - Experimental procedure

- Result
  - A summary table or graph of the results
  - Table or any figures with correct titles
  - A summary of the data of the experiment
- Discussion
  - Interpretation of the data
  - Impacts of the factors on reaction time
  - Comparison of your results with theory mentioned in the introduction
  - Comments on suitability of the method used
  - Suggestions for improving the experiment
  - A short conclusion supported with evidence
- References
  - References must be written in APA or Harvard referencing styles
- Appendix
  - Raw data
  - Calculations of reaction time

Location: General Science Laboratory, Block 1

Duration: 4 weeks (inclusive of 2 weeks Mid-Semester Break)

Start Date and Time: 13 March 2018, 1.30 – 4.30 pm

Submission Date and Time: 16 April 2018, 4.30 pm

Materials, tools and equipment (per group):

1. 50-cm ruler
2. Stopwatch

GENERAL PRACTICAL INSTRUCTIONS

1. **Before each practical class:**

- Read the relevant pages for your practical.
- Think about making notes and a plan of action.
- Ensure you know the potential hazards.
- If you are unsure of any procedures, make a note of any questions you want to ask.

2. On Practical day:

- Bring your lab coat.
- Wait outside the lab until you are asked to enter.
- Place your bags as indicated by the instructor-in-charge.
- Ensure lab coats are fastened and safety specs (if necessary) are worn at all times.
- Eating and drinking in the laboratory is strictly forbidden.
- Latex gloves or others that are appropriate should be worn throughout the practical. If you have an allergy to latex, please inform the demonstrator-in-charge or laboratory technicians immediately to allow a non-latex glove to be given.
- Do not start your practical until you are told to do so – it may be necessary to listen to an information session from the instructor / demonstrator-in-charge prior to starting.
- Any breakage of glassware has to be reported to the demonstrator-in-charge or laboratory technicians immediately.
- Unauthorised mobile phone use is prohibited during practical session.

3. Breakages:

- Ensure that you switch off any equipment that needs switching off.
- Make sure that any waste chemicals have been disposed of correctly.
- Rinse out all glassware and remove any labels before placing on the trolley provided.
- Workbench must be cleaned and all waste dispose of by end of session.

4. Laboratory Safety

- IBTE-SVW Campus laboratories are equipped and run so that with appropriate care, you can work without risking the health and safety of yourself and others. Accidents are unexpected or undesirable events, but they are avoidable with due care and attention.

YOU HAVE A DUTY TO WORK IN A WAY THAT WILL NOT HARM THE HEALTH AND SAFETY OF YOURSELF AND/OR OTHERS

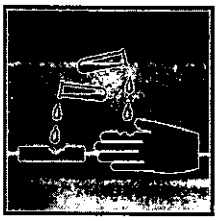
- All containers in the laboratory are labelled with their relevant hazards and any equipment that may present a hazard or needs instruction before use (or should only be operated by trained members of staff) will carry clear notices.

- LOW HAZARD chemicals can be hazardous if misused. HAZARDOUS chemicals require careful handling at all times because of one or more of the following characteristics:
  - (a) Flammability
  - (b) Explosive nature
  - (c) Toxic, hazardous, irritant, etc.
    - a. With effects on or through the skin
    - b. With effects on or through the respiratory tract
    - c. With effects on or through the eye
    - d. With effects following ingestion

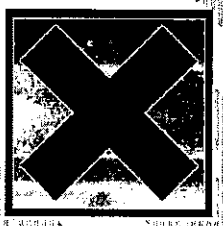
(d) Reactive with water
(e) Reactive with air
(f) Detrimental effect on the environment – especially to aquatic life

5. Hazardous chemicals carry a pictogram indicating the type of danger.

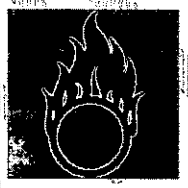
Toxic



Corrosive



Harmful Irritant



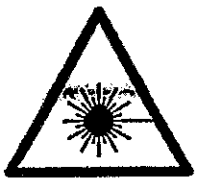
Irritant Oxidising

- Ensure that you know how to deal with any spillage ***BEFORE*** you embark on an experiment. Risk is associated with glassware, electrical, mechanical and high/low pressure apparatus.

- Do not ignore the warning signs displayed in the School. They are there for your protection.

i. Prohibitory Signs: e.g. "No smoking", are circular with a red border and crossbar over a black symbol on a white background.

ii. ***Warning Signs:*** e.g. "Caution, risk of ionising radiation", are triangular with a black border on a yellow background.



Laser Light

Risk of Ionising Radiation

iii. ***Mandatory Signs:*** e.g. "Eye Protection", are circular on a blue background with symbols in white; used when there is an obligation to wear safety equipment.

iv. ***Emergency Signs:*** e.g. "Emergency Showers", square or rectangular, on a green background with symbols in white.

6. Fire Fighting equipments, First Aid Equipments and Fire Exits

Know where the fire fighting, first-aid equipment, eyewash and emergency showers are situated. Ensure that you know the location of fire exits

7. **In the event of a FIRE ALARM or an EMERGENCY EVACUATION:**
   - Turn off all your equipment as you leave the laboratory and reassemble at the student's and visitors parking lot.

ENSURE THAT YOU READ THE PRACTICAL INSTRUCTIONS BEFORE AND DURING THE PRACTICAL CLASS, LISTEN TO INSTRUCTIONS FROM STAFF AND WATCH CAREFULLY ANY DEMONSTRATIONS OF EXPERIMENTAL PROCEDURES

REMEMBER:

Any mishap with a chemical (or apparatus) MUST be reported to a member of staff IMMEDIATELY so that they can deal with the problem and remove any hazards correctly.

ASSESSMENT MARKING SCHEME

SCORING RUBRIC

Criteria	Performance Levels					W (%)	Maximum Mark	Obtained Mark
	4 Excellent	3 Good	2 Satisfactory	1 Unsatisfactory	0 Undergraded			
a. **Format of the Report (5%)** The report should include the following headings: a. Table of Content b. Abstract c. Introduction d. Materials and Method e. Result f. Discussion g. References h. Appendix	All 8 of the required information are given	Any 5-7 of the required information are given	Any 4 of the required information are given	Any 1-3 of the required information are given	None of the required information is given	5	20	
b. **Clarity of Information (70%)** **The report describes all the necessary information on the practical activity** a. **Abstract** provides a brief description for i. Aims of the practical ii. Methodology iii. Results iv. Conclusion	All 4 of the required information are satisfactorily provided.	Any 3 of the required information are satisfactorily provided.	Any 2 of the required information are satisfactorily provided.	Any 1 of the required information is/are satisfactorily provided.	None of the required information is satisfactorily provided.	5	20	

b. **Introduction** i. Provide sufficient information on anatomy of the nervous system, including neurons and synapses ii. Provide sufficient background information on how information is transmitted in the nervous system iii. Describe reaction time and factors that can affect it iv. State the aims of the practical v. Provide in-text citation for at least half of the information cited.	All 5 of the required information are satisfactorily provided.	Any 3-4 of the required information are satisfactorily provided.	Any 2 of the required information are satisfactorily provided.	Any 1 of the required information is satisfactorily provided.	None of the required information is satisfactorily provided.	10	40	
c. **Materials and Method** i. List of materials used ii. Design of the experiment iii. Experimental procedure	All 3 of the required information are satisfactorily provided.	Any 2 of the required information are satisfactorily provided.	Only (ii) or (iii) is satisfactorily provided.	Only (i) is satisfactorily provided.	None of the required information is satisfactorily provided.	10	40	
d. **Result** i. Present a summary table or graph of the result ii. Title all tables and figures correctly iii. Provide a summary of the data from the experiment	All 3 of the required information are satisfactorily provided.	Any 2 of the required information are satisfactorily provided.	Only (i) or (iii) is satisfactorily provided.	Only (ii) is satisfactorily provided.	None of the required information is satisfactorily provided.	15	60	

e. **Discussion** i. Interpret the data correctly ii. Suggest impact of the factors on reaction, as supported by the results iii. Compare your results with the theory iv. Comment on the suitability of the method v. Include at least two suggestions for improving the experiment vi. Give a concluding paragraph based on the results obtained	All 6 of the required information are satisfactorily provided.	Any 4-5 of the required information are satisfactorily provided.	Any 3 of the required information are satisfactorily provided.	Any 1-2 of the required information is satisfactorily provided.	None of the required information is satisfactorily provided.	20	80	
f. **References** i. More than three references are used. ii. Sources are written correctly in APA or Harvard referencing styles. iii. Sources used are reliable and accurate. iv. Information is understood and used correctly.	All 4 of the required information are satisfactorily provided.	Any 3 of the required information are satisfactorily provided.	Any 2 of the required information are satisfactorily provided.	Any 1 of the required information is satisfactorily provided.	None of the required information is satisfactorily provided.	5	20	
g. **Appendix** provides i. Raw data ii. Title all tables and figures correctly iii. Calculations of reaction time	All 3 of the required information are satisfactorily provided.	Any 2 of the required information is satisfactorily provided.	Only (i) or (iii) is satisfactorily provided.	Only (ii) is satisfactorily provided.	None of the required information is satisfactorily provided.	5	20	

Skill-Based Criteria								
h. **Resourceful/Practicality (10%)** **Provide the following evidences:** 1) Use the resources effectively 2) Self-motivated and observe safety precaution throughout the experiment 3) Data is collected and recorded appropriately 4) Finished the practical work on time 5) Working area is properly cleaned.	All 5 evidences are observed.	Any 3-4 evidences are observed.	Any 2 evidences are observed.	Any 1 evidence is observed.	None of the evidence is observed.	10	40	
i. **Visual Appeal (5%)** a. Appropriate font size and type b. Justified and 2.0 spacing c. Reading is not affected by grammar or spelling errors d. Correct page numbering	Any 4 evidences are observed.	Any 3 evidences are observed.	Any 2 evidences are observed.	None or any 1 evidence is observed.	None of the evidence is observed.	5	20	
Attitude-Based Criteria								
j. **Promptness in the Submission of Work (5%)** a. Submit on 16 April 2018 by 4.30 pm	Submitted on time.	Submitted one working day late.	Submitted two working days late.	Submitted three working days late.	Submitted more than three working days late.	5	20	

k. **Group Work (5%)** a. Work is divided fairly during the experiment b. All members participate actively in the experiment c. Effective communication among group members	All 3 of the evidences are observed.	Any 2 of the evidences are observed.	Only (i) or (ii) is observed.	Only (iii) is observed.	None of the evidences is observed.	5	20	
Final Grade						100	400	

LABORATORY REPORT 2

FEEDBACK BY ASSESSOR:

TOTAL MARK

Student Signature		Date	
1st Assessor Signature		Date	
2nd Assessor Signature		Date	
Internal Verifier		Date	
External Verifier		Date	

Assessment Competency:	The learner should be able to design a graph in presenting and disseminating information about the marketability of a product
Assessment Task:	Designing Graphs for Product Presentation
Description of the Task:	
Who should do it:	Group of 4-5 members
When to do it:	Outside the class time
Source of data:	The learners can choose their own data to graph
Deadline for Submission	To be agreed upon by the teacher and learners

(A) Example of a Holistic Rubric (Format 1- Vertical Form)

Scoring Guide
Part I – Designing Graphs for Presentation (80% of the final grade for the work and all the group members get the same grade in this dimension)

Note: Part II will constitute 20% of the grade, which will be allotted to "individual Accountability" (*see Example E and F*)

Instructions: Please rate the graph based on the qualities described in the rubric. Check the indicator/s that the graph satisfies.

Performance Levels

6 – Outstanding
This is the level of quality of the work if **all** the given indicators were satisfied.

Indicators:
a. It presents complete information (i.e. title, labels for the x and y axes, legend if necessary).
b. It shows clear information about the marketability of the product being studied.
c. It shows relevant data (i.e. data shows present situation/topic being discussed in class)
d. It shows texts that are free from errors (e.g. spelling, grammar, computation)
e. It uses practical and durable materials.
f. It is well-written/colourful/ free from erasures.
g. It is submitted on time.
h. Others,(please specify)_____

5 – Very Satisfactory
This is the level of quality of the work if **one** of the given indicators was NOT satisfied.

Indicators:
a. It presents complete information (i.e. title, labels for the x and y axes, legend if necessary).
b. It shows clear information about the marketability of the product being studied.
c. It shows relevant data (i.e. data shows present situation/topic being discussed in class)
d. It shows texts that are free from errors (e.g. spelling, grammar, computation)
e. It uses practical and durable materials.
f. It is well-written/colourful/ free from erasures.
g. It is submitted on time.
h. Others,(please specify)_____

4 – Satisfactory
This is the level of quality of the work if **two** of the given indicators were NOT satisfied.

Indicators:
a. It presents complete information (i.e. title, labels for the x and y axes, legend if necessary).
b. It shows clear information about the marketability of the product being studied.
c. It shows relevant data (i.e. data shows present situation/topic being discussed in class)
d. It shows texts that are free from errors (e.g. spelling, grammar, computation)
e. It uses practical and durable materials.
f. It is well-written/colourful/ free from erasures.
g. It is submitted on time.
h. Others,(please specify)_____

3 – Moderately Satisfactory
This is the level of quality of the work if **three** of the given indicators were NOT satisfied.

Indicators:
a. It presents complete information (i.e. title, labels for the x and y axes, legend if necessary).
b. It shows clear information about the marketability of the product being studied.
c. It shows relevant data (i.e. data shows present situation/topic being discussed in class)
d. It shows texts that are free from errors (e.g. spelling, grammar, computation)
e. It uses practical and durable materials.
f. It is well-written/colourful/ free from erasures.
g. It is submitted on time.
h. Others,(please specify)_____

2– Slightly Satisfactory
This is the level of quality of the work if **four to five** of the given indicators were NOT satisfied.

Indicators:
a. It presents complete information (i.e. title, labels for the x and y axes, legend if necessary).
b. It shows clear information about the marketability of the product being studied.
c. It shows relevant data (i.e. data shows present situation/topic being discussed in class)
d. It shows texts that are free from errors (e.g. spelling, grammar, computation)
e. It uses practical and durable materials.
f. It is well-written/colourful/ free from erasures.
g. It is submitted on time.
h. Others,(please specify)_____

1– Poor
This is the level of quality of the work if six or more of the given indicators were NOT satisfied.

Indicators:
a. It presents complete information (i.e. title, labels for the x and y axes, legend if necessary).
b. It shows clear information about the marketability of the product being studied.
c. It shows relevant data (i.e. data shows present situation/topic being discussed in class)
d. It shows texts that are free from errors (e.g. spelling, grammar, computation)
e. It uses practical and durable materials.
f. It is well-written/colorful/ free from erasures.
g. It is submitted on time.
h. Others,(please specify)_____

0 - no attempt

(B) Example of a Holistic Rubric (Format 2- Horizontal Form)

Scoring Guide

Part I - The Bar Graph (80% of the final grade for the work and all the group members get the same grade in this dimension)

Instructions: Please rate the bar graph based on the 6-point scale considering the descriptions given for each level of quality. Check the indicator/s that the graph satisfies and then encircle the level of its quality.

Indicators of Quality Work	6 Outstanding	5 Very Satisfactory	4 Satisfactory	3 Moderately Satisfactory	2 Slightly Satisfactory	1 Poor	0
Indicators: a. It presents complete information (i.e. title, labels for the x and y axes, legend if necessary). b. It shows clear information about the marketability of the product being studied. c. It shows relevant data (i.e. data shows present situation/topic being discussed in class) d. It shows texts that are free from errors (e.g. spelling, grammar, computation) e. It uses practical and durable materials. f. It is well written/ colourful/ free from erasures. g. It is submitted on time. h. Others,(please specify)_____	All indicators are evident	1 indicator is NOT evident	2 indicators are NOT evident	3 indicators are NOT evident	4 indicators are NOT evident	5 or more indicators are NOT evident	No work given

Note: Part II will constitute 20% of the grade, which will be allotted to "individual Accountability" (*see Example E and F*)

(C) Example of an Analytic Rubric

Scoring Guide

Part I – Designing the Bar Graph for Presentation (80% of the final grade for the work)

Instructions: Please rate the graph based on the qualities described in the rubric. Check the indicator/s that the graph satisfied.

Criteria/Indicators/ Weight	Performance Levels						Rating
	6 Outstanding	5 Very Satisfactory	4 Satisfactory	3 Moderately Satisfactory	2 Slightly Satisfactory	1 Poor	
A. Knowledge-based Criteria							
1. Completeness of Information (15%) The graph has: a. a title b. label for the x -axis c. label for the y- axis d. data conveyed through the graph e. legend for codes used in the graph f. other information necessary (pls.specify)	All the needed information for the graph constructed are given.	1 required information is missing /incomplete	2 required information are missing /incomplete	3 required information are missing /incomplete	4 or more required information are missing /incomplete	None of the required information is given	
2. Clarity of Information (15%) a. The graph clearly conveys the marketability of the product being studied. b. The graph chosen is appropriate for the data being presented. c. Information is easy to read and interpret	All indicators are evident.	Only 2 indicators are evident	Only the 1st indicator is evident.	Only the 2nd indicator is evident.	Only the 3nd indicator is evident.	None of the indicators is evident.	
3. Relevance of Information (10%) a. Data shown are relevant to what is being studied in class. b. Data shown are reflective of the present situation in one's community. c. Data shown are reflective of the present situation in the whole country/world.	All indicators are evident	Only 2 indicators are evident	Only the 1st indicator is evident.	Only the 2nd indicator is evident.	Only the 3nd indicator is evident.	None of the indicators is evident.	
4. Accuracy of Work (15%) Possible errors a. Grammar b. Spelling c. Punctuation d. Capitalization e. Computation/estimation	No error at all	1 error	2 errors	3 errors	4 errors	5 or more errors	

Source: Balagtas, Marilyn U., Phd. Notes from Regional Training Programme on Strengthening Competency Assessment in TVET. SEAMEO VOCTECH. August 2014

Criteria/Indicators/ Weight	Performance Levels						Rating
	6 Outstanding	5 Very Satisfactory	4 Satisfactory	3 Moderately Satisfactory	2 Slightly Satisfactory	1 Poor	
B. Skills-based Criteria							
6. Resourcefulness /Practicality (10%) a. Materials used are not expensive. b. Presentation materials can be repeatedly used. c. Preparation/use of the materials is not time consuming.	All indicators are evident.	Only 2 indicators are evident	Only the 1st indicator is evident.	Only the 2nd indicator is evident.	Only the 3nd indicator is evident.	None of the indicators is evident.	
7. Visual Appeal (10%) a. Well-written/computerized b. Colourful c. Free from erasures	All the three indicators were evident.	Well-written And colourful but with erasures	Well-written And free from erasures but not colourful	free from erasures and colourful but not well written	only one of the three indicators was evident	none of the three indicators was evident	
C. Attitudes-based Criteria							
8. Promptness in the Submission of Work (5%)	Given ahead of time	given on time	1-5 hours late	6-12 hours late	13-23 hours late	1 or more day/s late	
9. Others,(please specify) _____							
Final Rating							

Note: Part II will constitute 20% of the grade, which will be allotted to "individual Accountability" (*see Example E and F*)

Source: Balagtas, Marilyn U., Phd. Notes from Regional Training Programme on Strengthening Competency Assessment in TVET. SEAMEO VOCTECH. August 2014

(D) Example of a "Weighted" Analytic Rubric - Design Project Assessment (/39)

Module Title: _____ Date: _____

Team/Student: _____ Reviewer: _____

Topic (Weight)	Unacceptable (0)	Marginal (1)	Acceptable (2)	Exceptional (3)	Points
Design Problem and Boundaries (1)	Little or no grasp of problem. Incapable of producing a successful solution.	Some understanding of problem. Major deficiencies that will impact the quality of solution.	Overall sound understanding of the problem and constraints. Does not significantly impair solution.	Clear and complete understanding of design goal and constraints.	/3
Alternative Designs (2)	Only one design presented or clearly infeasible alternative given.	Serious deficiencies in exploring and identifying alternative designs.	Alternative approaches identified to some degree.	Final design achieved after review of reasonable alternatives.	/6
Use of Computer–Aided Tools (2)	Serious deficiencies in understanding the correct selection and/or use of tools.	Minimal application and use of appropriate tools.	Computer–aided tools used with moderate effectiveness to develop designs.	Computer–aided tools are used effectively to develop and analyze designs.	/6
Application of Engineering Principles (2)	No or erroneous application of engineering principles yielding unreasonable solution.	Serious deficiencies in proper selection and use of engineering principles.	Effective application of engineering principles resulting in reasonable solution.	Critical selection and application of engineering principles ensuring reasonable results.	/6
Final Design (3)	Not capable of achieving desired objectives. No implementation of resource conservation and recycle strategies.	Barely capable of achieving desired objectives. Minimal utilization of resource conservation and recycle potentials.	Design meets desired objectives. Moderately effective utilization of resource conservation and recycle potentials.	Design meets or exceeds desired objectives. Effective implementation of resource conservation and recycle strategies.	/9
Process Economics (1)	No or totally erroneous cost estimates presented.	Reasonable cost estimates presented, but no profitability analysis included.	Reasonable profitability analysis presented, but no interpretation of the results.	Effective use of profitability analysis leading to improvement recommendations.	/3

Source: https://www.uleth.ca/teachingcentre/sample-rubrics-and-scoring-guides
https://drive.google.com/file/d/0B55WmRDWIP33M05hUmVoQmpzWk0/view

Interpretation of Results (2)	No, or obviously erroneous, conclusions are presented.	Serious deficiencies in support for stated conclusions.	Sound conclusions reached based on achieved results.	Insightful, supported conclusions and recommendations.	/6
OVERALL PERFORMANCE	**Unacceptable**	**Marginal**	**Acceptable**	**Exceptional**	**TOTAL**
POINTS REQUIRED	**0–9**	**10–19**	**20–29**	**30–39**	**/39**

Source: https://www.uleth.ca/teachingcentre/sample-rubrics-and-scoring-guides
https://drive.google.com/file/d/0B55WmRDWIP33M05hUmVoQmpzWk0/view

(E) Example to Obtain an Individual Mark from a Groupwork based on the Group's Grade

The members of the group rate each other's performance in the group using the final grade of the work as the ceiling grade. The average of the ratings given by all the group members to a member will be the final grade of that member in this work.

Example: Supposed the over-all mark of the group based on the assessors is 90%. This mark will be the highest to give to each member of the group. The group can agree on their basis in rating each other (peer assessment), which is better set at the beginning with the knowledge of the instructor/assessors.

Members to be Rated	Members' Ratings (based on the Final group Grade and Rubric for Group Activity set)					Final rating (Average of the Rating)
	1	2	3	4	5	
1	90	89	88	88	87	88.4
2	89	89	90	88	88	88.8
3	88	90	89	89	87	88.6
4						
5		ETC.				

Note: This is Part II (20%) of the task a continuation from Part I in example (A) above.

(F) Example to Obtain an Individual Mark from a Groupwork based on Defined Weight for Individual Accountability

In this method, individual accountability is set as additional criterion in marking. The raters are members within the group and their average ratings will be the grade of a member of the same group in this criterion. This will be added to the other criteria used in rating the quality of the work of the group. In this case the instructor may or may not be the evaluator.

Example: In the activity on constructing a bar graph in which the learners were asked to form groups with 4 to 5 members, the holistic rubric below shows possible indicators in rating individual accountability in the group work that could be used to rate the individual member in the group.

Instructions: Please write the name of the member of the group you are rating. Then rate him/her using the 5-pt scale holistic rubric given below. Check (/) the indicators that could justify the rating given to the group member to ensure objectivity in scoring. Reflect your rating in the last column.

Name of Group Member Being Evaluated: _____

Within-Group Peer Evaluator: _____

Indicators for Individual Accountability	5 Outstanding	4 Very Satisfactory	3 Satisfactory	2 Moderately Satisfactory	1 Poor	Rating
	ALL indicators are evident	1-2 indicator/s is/are NOT evident	3-4 indicators are NOT evident	5-6 indicators are NOT evident	7 or more indicators are NOT evident	
a. attends all meetings set during the preparation of the work						
b. attends on time all the meetings set by the group						
c. shares ideas on how to accomplish the work						
d. listens to other's ideas on how to do better the group work						
e. performs the assigned/chosen work						
f. does satisfactorily the assigned/chosen work						
g. contributes in cash or in kind to cover expenses incurred in doing the group activity						
h. Other traits of a cooperative member (Pls. specify)						

Note: This is Part II (20%) of the task a continuation from Part I in example (A) above.

(G) Example of an "Anaholistic" Rubric

"Anaholistic" rubrics are a hybrid of analytical and holistic rubrics which identify specific components of an assignment that will be graded. An "anaholistic" rubric, however only identifies the criteria which need to be assessed and the maximum grade which may be awarded for each component of an assignment. The marker must decide what grade to award for each component based on the criteria provided. Criteria may be weighted as well, if necessary and appropriate.

Example: Lesson Plan Assignment /15

Scoring	Criteria	Score
3	Unit Overview: Unit outcomes related to this lesson are specifically identified. The unit's sequence of instruction is clearly described, and distinctly establishes where this lesson is in sequence and relevant to other unit outcomes.	
4	Lesson Plan in General: The lesson plan's focuses on one or more specific learning outcomes is clearly and explicitly evident. The plan distinctly identifies class specifics (i.e. grade, subject, topic, related resources and technologies needed), and is organized in a manner that is easy to follow while facilitating instruction (typed, numbered etc.). Includes a detailed timeline for teaching and learning activities	
5	Lesson Plan Components: An explicit introduction outlines where the lesson is heading, reviews previous concepts, hooks students interest by demonstrating relevancy. The plan provides step by step explanations of the processes of instruction and student activities. The knowledge, skills and/or understandings to be acquired by students and specifically and clearly identified. Teaching/learning processes are detailed, clear, logical, sequential, and consistent with the stated learning outcomes. Essential questions are identified and defined. Integrated formative assessments are clearly and concisely identified. All supplementary assignments, resources, and/or activities are described and explained. Comprehensive details of the methodology to be used is presented.	
3	Lesson Specifics: Plans for differentiated instruction including possible supportive and extension activities are identified. An appropriate means of summative assessment of students' achievement of learning outcomes is identified and described. Classroom management is addressed and appropriately describes issues of transition, classroom arrangements, materials and resource distribution, and movement appropriate to methodology used, age and grade, and subject.	
	Total/15	

Source: https://www.uleth.ca/teachingcentre/sample-rubrics-and-scoring-guides
https://drive.google.com/file/d/0B55WmRDWIP33bFJsWkVyZkpKVTA/view

IBTE Institute of Brunei Technical Education	**QPD-16 Procedures for Preparation of Written Test / Examination Question Papers**	Rev : 1 Date : Mar 18

Scope : Written test and examination preparation process. *(For Practical Test, please refer to QPD-16A)*

Purpose : To have a systematic approach in preparation of test and examination question papers to ensure that the assessment process is monitored and consistent with module guide.

DEF/ABBREV :

EAC	- Examination and Assessment Centre
HOS/PL/ ML	- Head of School/Programme Leader/Module Leader
GL	- Group Leader
CBA	- Competency Based Assessment
CBET	- Competency Based Education and Training

PL/ML appoints Setter and Vetter for each assessment (appointed Setter and Vetter should be well-versed with the module).
The assessment methods must follow the assessment scheme provided in the endorsed module guide.
PL/ML to prepare programme assessment calendar for all modules and submit to EAC.

Approved question papers, marking schemes, table of specifications and completed **QPF-35A** form are kept by EAC for safekeeping and printing purposes.

EAC is to print and prepare sufficient copies of question papers and answer booklets.

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PL informs Setter to prepare 3 sets of question papers, marking schemes and table of specifications.
Upon completion, the Setter is to complete section A of **QPF-35A** form.

⇩

Setter submits the question papers, marking schemes, table of specifications and **QPF-35A** form to the Vetter to ensure compliance with endorsed module guide and CBA requirements.

⇩

Vetter provides feedback to the setter and upon agreement, will complete Section B of **QPF-35A** form.

In the case where second vetting is required, setter submits both commented and amended question papers, marking schemes, table of specifications and return the above **QPF-35A** form to the Vetter. Upon agreement, the Vetter will complete Section C of **QPF 35A** form.

⇨

Setter submits the commented and vetted question papers, marking schemes, table of specifications and **QPF-35A** form to PL/ML for internal verification. Upon agreement, the internal verifier will complete section D of **QPF-35A** form.

⇧

PL/ML submits the verified question papers, marking schemes, table of specifications, **QPF-35A** to external verifier for approval.
Upon approval, the External Verifier (CBET/EAC) will complete section E of **QPF-35A** form and make a copy of the completed **QPF-35A** to notify the setter.

IBTE Institute of Brunei Technical Education	QPD-16A Procedures for Preparation of Other Assessment Papers	Rev : 1 Date : Mar 18

Scope : Preparation of Other Assessment Paper.
Other assessment includes Assignment, Reports, Presentation, Portfolio, Laboratory / Practical Work, Laboratory Test, Laboratory Report, and Projects.

Purpose : To have a systematic approach in preparation of Other Assessment Papers to ensure that the assessment process is monitored and consistent with module guide.

DEF/ABBREV :

EAC	-	Examination and Assessment Centre
PL/ ML	-	Programme Leader /Module Leader
GL	-	Group Leader
CBA	-	Competency Based Assessment
CBET	-	Competency Based Education and Training

PL/ML appoints Setter and Vetter for each assessment (appointed Setter and Vetter should be well-versed with the module).
The assessment methods must follow the assessment scheme provided in the endorsed module guide.
PL / ML to prepare programme assessment calendar for all modules and submit to EAC.

Approved assessment paper, rubrics / marking scheme and completed **QPF-35A1** form are submitted to EAC for safekeeping.

The Module Instructor is to print and prepare sufficient copies of assessment papers.

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Setter prepares 1 set of assessment paper and its corresponding rubrics / marking scheme. Upon completion, Setter is to complete section A of **QPF-35A1**.

Setter submits the assessment paper, rubrics / marking scheme and **QPF-35A1** to the vetter to ensure compliance with endorsed module guide and CBA requirements.

Vetter provides Feedback to the setter and upon agreement, will complete Section B of **QPF-35A1**.

In the case where a second vetting is required, setter submits both commented and amended assessment papers, rubrics / marking scheme, table of specifications and return the above **QPF-35A1** to the Vetter. Upon agreement, Vetter will complete Section C of **QPF 35A1**.

The Setter submits commented and vetted assessment question papers, rubrics / marking scheme and **QPF-35A1** to PL/ML for internal verification. Upon agreement, the internal verifier will complete section D of **QPF-35A1**.

PL/ML submits the assessment paper, rubrics / marking scheme, and **QPF-35A1** to external verifier for approval.

Upon approval, the External Verifier (CBET/EAC) will complete section E of **QPF-35A1** and return the approved assessment paper, rubrics / marking schemes, and completed **QPF-35A1** to the Setter* to make copies.

*The Setter ensures that all module instructors teaching the same module receive a copy of the approved assessment paper, rubrics / marking schemes, and completed **QPF-35A1**.

NOTE:
When a verified assessment is being reused, the Module Instructor is allowed to forgo QPD-16A. However, he/she is required to complete **QPF-35D** Request Form for Using Past Assessment Paper and submit to PL / ML and EAC for approval, at least 2 weeks prior to the assessment.

IBTE Institute of Brunei Technical Education	QPD-17 Procedures for Assessment Results Verification	Rev : 1 Date : Mar 18

Scope : Assessment results/marks verification process.

Purpose : To have a systematic approach conducting assessment verification to ensure accurate records of students' assessment papers and marks are monitored and verified.

DEF/ABBREV :
- EAC - Examination and Assessment Centre
- HOS/PL- Head of School/Programme Leader
- GL - Group Leader
- AR - Assessment Results

Upon completion of the marking, First Assessor fills in Section A of verification form [**QPF-35B**] and submits it together with graded answer script to Second Assessor for vetting.

⇩

Upon agreement, the Second Assessor will complete Section B of **QPF-35B** and return the vetted answer scripts and **QPF-35B** to the First Assessor.

Any corrections to the answer scripts will be done by the First Assessor.

⇩

Cont'd on next page ...

EAC arranges Final Course Team meeting for review and declaration of the results (entered AR Form against respective Module Instructors' records).

⇧

Approved by : CEO

... from previous page

First Assessor hand over the vetted answer scripts to Module Instructor.

Module Instructor completes Section E of **QPF-35B**.

Module Instructor returns the vetted answer scripts with feedback to students for future improvement.
The students will sign their vetted answer scripts as acknowledgment and return the answer scripts to the Module Instructor.

Module Instructor ensures all assessment documents (students' answer scripts, assignments and marking scheme) are available, arrangement of students' Answer Scripts is according to the name list in AR form and marks are in raw marks (over 100%), and submits the answer scripts and **QPF-35B** to PL / ML for internal verification..

Upon agreement, the Internal Verifier will complete Section C of **QPF-35B** and submit all assessment documents and **QPF-35B** to External Verifier (EAC).

EAC will verify all assessment documents and complete Section D of **QPF-35B**.

EAC will enter the final marks for each modules in AR form.

All verified answer scripts are kept under security and responsibility of the GL.

IBTE Institute of Brunei Technical Education	INTERNAL VERIFICATION FORM (TEST / EXAMINATION QUESTION PAPERS)	Rev: 1 Date : Mar 18 QPF-35A

School : _____ Campus : _____

SECTION A: To be completed by Assessment Setter / Module Instructor					
Programme Title			**Group Code**		
			No. of students		
Module Title					
Assessment Component	☐ Coursework		☐ Examination		
Date of Assessment		**Time**			
Assessment Type					
Name of Setter					
Date of Submission for Verification		**Signature**			

SECTION B: To be completed by Vetter (First Vetting)								
Name of Vetter							**Date Received**	
Checklist	**Set A**		**Set B**		**Set C**		**Remarks**	
	Yes	**No**	**Yes**	**No**	**Yes**	**No**		
Coverage of Performance Objectives	☐	☐	☐	☐	☐	☐		
Marking scheme (rubric) are appropriate	☐	☐	☐	☐	☐	☐		
Instructions are clear and well-presented	☐	☐	☐	☐	☐	☐		
Questions are valid and appropriate in content	☐	☐	☐	☐	☐	☐		
Signature							**Date Returned**	

SECTION C: To be completed by Vetter (Second Vetting, if applicable)

Name of Vetter		Date Received	

Checklist	Set A		Set B		Set C		Remarks
	Yes	No	Yes	No	Yes	No	
Coverage of Performance Objectives	☐	☐	☐	☐	☐	☐	
Marking scheme (rubric) are appropriate	☐	☐	☐	☐	☐	☐	
Instructions are clear and well-presented	☐	☐	☐	☐	☐	☐	
Questions are valid and appropriate in content	☐	☐	☐	☐	☐	☐	

Signature		Date Returned	

*** For MIB, IRK, Applied Numeracy, Applied IT, Business Enterprise Planning / Skills, Communication in English, Engineering Science, Basic Engineering Science, HSSE & OGI, SECTION C is to be filled up by Module Leader.*

SECTION D: To be completed by Internal Verifier (Programme Leader / Module Leader)

Name of Internal Verifier		Date Received	

☐ Approved ☐ Not Approved

Comments/Suggestions

SECTION E: To be completed by External Verifier (CBET / EAC)

Name of External Verifier		Date Received	

☐ Approved ☐ Not Approved

Comments/Suggestions

Signature		Date	
Signature		Date	

IBTE Institute of Brunei Technical Education	INTERNAL VERIFICATION FORM (COURSEWORK / LABORATORY WORK / PRACTICAL WORK / PROJECT WORK)	Rev: 0 Date : Mar 18 QPF-35A1

School : _____ Campus : _____

SECTION A: To be completed by Assessment Setter / Module Instructor				
Programme Title		**Group Code**		
		No. of students		
		Attempt	☐ First	☐ Resit
Module Title				
Assessment Component	☐ Coursework	☐ Laboratory / Practical Work	☐ Project Work	
Date of Assessment		**Time**		
Assessment Type				
Name of Setter				
Date of Submission for Verification		**Signature**		

SECTION B: To be completed by Vetter (First Vetting)				
Name of Vetter			**Date Received**	
Checklist	**Yes**	**No**	**Remarks**	
Coverage of Performance Objectives	☐	☐		
Marking scheme (rubric) are appropriate	☐	☐		
Instructions are clear and well-presented	☐	☐		
Questions are valid and appropriate in content	☐	☐		
Signature			**Date Returned**	

SECTION C: To be completed by Vetter (Second Vetting, if applicable)				
Name of Vetter			**Date Received**	
Checklist	**Yes**	**No**	**Remarks**	
Coverage of Performance Objectives	☐	☐		
Marking scheme (rubric) are appropriate	☐	☐		
Instructions are clear and well-presented	☐	☐		
Questions are valid and appropriate in content	☐	☐		
Signature			**Date Returned**	

***** For MIB, IRK, Applied Numeracy, Applied IT, Business Enterprise Planning / Skills, Communication in English, Engineering Science, Basic Engineering Science, HSSE & OGI, SECTION D is to be filled up by Module Leader.***

SECTION D: To be completed by Internal Verifier (Programme Leader / Module Leader)			
Name of Internal Verifier		**Date Received**	
☐ **Approved** ☐ **Not Approved** **Comments/Suggestions**			

SECTION E: To be completed by External Verifier (CBET / EAC)			
Name of External Verifier		**Date Received**	
☐ **Approved** ☐ **Not Approved** **Comments/Suggestions**			
Signature		**Date**	
Signature		**Date**	

IBTE Institute of Brunei Technical Education	INTERNAL VERIFICATION FORM (ANSWER SCRIPTS)	Rev: 1 Date : Mar 18 QPF-35B

School : _____ **Campus :** _____

SECTION A: To be completed by First Assessor					
Programme Title		**Group Code**			
		No. of students			
		Attempt	☐ First	☐ Resit	
Module Title					
Assessment Component	☐ Coursework	☐ Laboratory / Practical Work	☐ Project Work	☐ Examination	
Date of Assessment					
Assessment Type					
Name of Marker					
Date of Submission to Second Assessor		**Signature**			

SECTION B: To be completed by Second Assessor			
Name of Second Assessor		**Date Received**	
Total number of scripts received		**Number of scripts verified**	
Comments/Suggestions			
Signature		**Date Returned**	

*** For MIB, IRK, Applied Numeracy, Applied IT, Business Enterprise Planning / Skills, Communication in English, Engineering Science, Basic Engineering Science, HSSE & OGI, SECTION C is to be filled up by Module Leader.*

SECTION C: To be completed by Internal Verifier (Programme Leader / Module Leader)			
Name of Internal Verifier		Date Received	
☐ Agreed ☐ Not Agreed Comments/Suggestions			

SECTION D: To be completed by Examination and Assessment Centre			
Name of External Verifier		Date Received	
☐ Agreed ☐ Not Agreed Comments/Suggestions			
Signature		Date	
Signature		Date	

SECTION E: To be completed by Module Instructor

STUDENTS' ASSESSMENT RESULTS MARKS

No.	Student Name	Marks (100%)	Grade	Remarks

GRADE	NO. OF STUDENTS
A* (90 to 100)	
A (80 to 89)	
B (70 to 79)	
C (60 to 69)	
D (50 to 59)	
F (49 and below)	
TOTAL	

IBTE Institute of Brunei Technical Education	RESIT FORM	Rev: 1 Date : Mar 18 QPF-35C

School : _____ **Campus :** _____

EXAMINATION & ASSESSMENT CENTRE
RESIT FORM

Programme Title: _____

Group Code: _____

Module Title: _____

Module Instructor: _____

Date / Time of Resit: _____

Venue: _____

Assessment Type: _____

No.	Student's Name	IC Number	Marks Obtained	Signature	Remarks

Date of Submission to EAC: _____

Received by EAC (Signature & Date): _____

Note:

1. For any absence with permission, please include the relevant document.
2. Module instructor should retain a copy of this form as documented information.

Note: Please submit this form at least 3 working days before the resit date.

IBTE Institute of Brunei Technical Education	REQUEST FORM FOR USING PAST ASSESSMENT PAPER	Rev: 0 Date : Mar 18 QPF-35D

School : _____ **Campus :** _____

SECTION A: To be completed by Module Instructor			
Programme Title			
Group Code		**Date of Assessment**	
Module Title			
Name of Module Instructor			
Assessment Component	☐ Coursework	☐ Laboratory / Practical Work	☐ Project Work
Assessment Type			
Date of Request		**Signature**	

SECTION B: To be completed by Programme Leader / Module Leader			
Name of Programme Leader / Module Leader		**Date Received**	
☐ **Approved** ☐ **Not Approved** **Remarks**			

SECTION C: To be completed by CBET / EAC			
Name of CBET / EAC Personnel		**Date Received**	
☐ **Approved** ☐ **Not Approved** **Remarks**			
Signature		**Date**	
Signature		**Date**	

Note:

1. Please submit the form together with a set of the verified assessment / question paper and its completed QPF-35A1.
2. The request is to be made **at least 2 weeks before** the assessment date.

IBTE Institute of Brunei Technical Education	POSTPONEMENT OF TEST	Rev: 0 Date : Mar 18 QPF-35E

School : _____ **Campus :** _____

SECTION A: To be completed by Module Instructor			
Programme Title			
Group Code			
Module Title			
Name of Module Instructor			
Assessment Type			
Original Date of Assessment		**New Date of Assessment**	
Reason for Postponement			
Date of Submission to EAC		**Signature**	

SECTION B: To be completed by EAC	
Name of EAC Personnel	
Date Received	
Signature	

COMPULSORY MODULES

A. MODUL ISLAMIC RELIGIOUS KNOWLEDGE (IRK)

No.	Kod & Tajuk Modul Status Modul Nilai Kredit/Waktu diperuntukan Peratus Minima Lulus	Peringkat & Program yang menggunakan	Tarikh Modul digunakan dan Tarikh mansuh	Skim Penilaian	Tarikh Disahkan
1.	**DC01** **Islamic Religious Knowledge for Diploma** **JULY 2016** Compulsory 5 kredit/50 jam 50%	Diploma in Nautical Studies & Diploma in Marine Engineering	Julai 2016 Sehingga Jun 2019	**Tugasan (100%)** 1. Penilaian Berterusan (70%) 2. Ujian Bertulis (30%)	**13 August 2016**
2.	**HC01** **Islamic Religious Knowledge for HNTec** **JULY 2016** Compulsory 5 kredit/50 jam 50%	Untuk semua programme di peringkat HNTec	Julai 2016 Sehingga Jun 2019	**Tugasan (100%)** 1. Penilaian Berterusan (70%) 2. Ujian Bertulis (30%)	**13 August 2016**
3.	**NC01** **Islamic Religious Knowledge for NTec** **JULY 2016** Compulsory 5 kredit/50 jam 50%	Untuk semua programme di peringkat NTec	Julai 2016 Sehingga Jun 2019	**Tugasan (100%)** 1. Penilaian Berterusan (70%) 2. Ujian Bertulis (30%)	**13 August 2016**
4.	**IC01** **Islamic Religious Knowledge for ISQ** **JULY 2016** Compulsory 5 kredit/50 jam 50%	Untuk semua programme di peringkat ISQ	Julai 2016 Sehingga Jun 2019	**Tugasan (100%)** 1. Penilaian Berterusan (70%) 2. Ujian Bertulis (30%)	**13 August 2016**
5.	**RC01** **Islamic Religious Knowledge for Ratings** **JULY 2016** Compulsory 3 kredit/30 jam 50%	Deck Rating Engine Rating	Julai 2016 Sehingga Jun 2019	**Tugasan (100%)** 1. Penilaian Berterusan (60%) 2. Ujian Bertulis (40%)	**13 August 2016**

B. MODUL MELAYU ISLAM BERAJA (MIB)

No.	Kod & Tajuk Modul Status Modul Nilai Kredit/Waktu diperuntukan Peratus Minima Lulus	Peringkat & Program yang menggunakan	Tarikh Modul digunakan dan Tarikh mansuh	Skim Penilaian	Tarikh Disahkan
1.	**DC02** **Melayu Islam Beraja for Diploma** **JULY 2017** Compulsory 5 kredit/50 jam 50%	Diploma in Nautical Studies & Diploma in Marine Engineering	July 2017 sehingga June 2021	**Tugasan (100%)** 1. Tugasan (individu/berkumpulan: Esei, laporan, bengkel, penyampaian/ pembentangan, forum, seminar, Mini Projek dll (70%) 2. Ujian Bertulis (30%)	**7 August 2017**
2.	**I/N/HC02** **Melayu islam Beraja for ISQ, NTec & HNTec** **JULY 2017** Compulsory 5 kredit/50 jam 50%	Untuk semua programme di peringkat ISQ, NTec dan HNTec	July 2017 sehingga June 2021	**Tec/HNTec:** **Tugasan (100%)** 1. Tugasan (scrapbook/poster/brosur/ calendar/rekabentuk/video/album dll) (50%) 2. Ujian Bertulis (50%) **ISQ:** **Tugasan (100%)** 1. Tugasan (scrapbook/poster/brosur/ calendar/rekabentuk/video/album dll) (50%) 2. Ujian Bertulis (50%)	**7 August 2017**
3.	**RC02** **Melayu Islam Beraja for Ratings** **MAY 2017** Compulsory 3 kredit/30 jam 50%	Deck Rating Engine Rating	May 2017 sehingga April 2021	**Tugasan (100%)** 1. Tugasan (latihan bertulis, penyampaian ringkas dll) (50%) 2. Ujian Bertulis (50%)	**7 August 2017**

Level	Programme Title	Module Code/Title	Date of Implementation
ISQ	1. Marker Fitter (MKR)	ISQCG01 LIFE SKILLS FOR WORKPLACE ISQ	September 2016
	2. Rigger (RIG)		
	3. Scaffolder (SCF)		
	4. Welder (WEL)		
	5. Industrial Blaster Painter (IBP)		April 2015
	6. Heavy Vehicle Driver (IHVD)		
	7. Rig Crew (RCW)		*TBC
NTec	1. Aquaculture (AQU)	NCG01.1 LIFE SKILLS FOR WORKPLACE NTEC	July 2015
	2. Business and Administration (BNA)	NCG01.2 LIFE SKILLS FOR WORKPLACE NTEC	
	3. Crop and Livestock Production (CLP)	NCG01.3 LIFE SKILLS FOR WORKPLACE NTEC	
	4. Assistant Nurse (General Nursing)		
	5. Assistant Nurse (Dental)		
	6. Care Givers (Cancer Care)		

Level	Programme Title	Module Code/Title	Date of Implementation
NTec	7. Electrical Technology (ELT)	NCG01.4 LIFE SKILLS FOR WORKPLACE NTEC	July 2015
	8. Armament and Instrument Maintenance (AIM)		July 2016
	9. Industrial Equipment Maintenance (IEM)		
	10. Machining (MCH)		
	11. Welding (WLD)		
	12. Food Processing (FPR)	NCG01.5 LIFE SKILLS FOR WORKPLACE NTEC	July 2015
	13. Information Technology (ITN)	NCG01.6 LIFE SKILLS FOR WORKPLACE NTEC	
	14. Culinary Operations (CUL)	NCG01.7 LIFE SKILLS FOR WORKPLACE NTEC	
	15. Light Vehicle Mechanics (LVM)	NCG01.8 LIFE SKILLS FOR WORKPLACE NTEC	
	16. Heavy Vehicle Mechanics (HVM)	NCG01.9 LIFE SKILLS FOR WORKPLACE NTEC	
	17. Building Craft (BCR)	NCG01.10 LIFE SKILLS FOR WORKPLACE NTEC	July 2016
	18. Rooms Division Operations (RDO)	NCG01.11 LIFE SKILLS FOR WORKPLACE NTEC	July 2017

Level	Programme Title	Module Code/Title	Date of Implementation
NTec Apprenticeship	1. Apprenticeship in Professional Cookery and Services (APC)	**NACG01.1 LIFE SKILLS FOR WORKPLACE NTEC APPRENTICESHIP**	July 2015
	2. Apprenticeship in Refrigeration and Air Conditioning (RAC)	**NACG01.2 LIFE SKILLS FOR WORKPLACE NTEC APPRENTICESHIP**	
	3. Apprenticeship in Automotive Technician (ATE)	**NACG01.3 LIFE SKILLS FOR WORKPLACE NTEC APPRENTICESHIP**	
HNTec	1. Building Services Engineering (BSE)	**HCG01 LIFE SKILLS FOR WORKPLACE HNTEC**	July 2015
	2. Electrical Engineering (ELE)		July 2013
	3. Plant Engineering (PLE)		
	4. Instrumentation and Control Engineering (ICE)		
	5. Mechanical Engineering (MEC)		
	6. Office Administration (OAD)	**HCG01.1 LIFE SKILLS FOR WORKPLACE HNTEC**	July 2015
	7. Business and Finance (BNF)	**HCG01.2 LIFE SKILLS FOR WORKPLACE HNTEC**	
	8. Computer Networking (CNW)	**HCG01.3 LIFE SKILLS FOR WORKPLACE HNTEC**	

Level	Programme Title	Module Code/Title	Date of Implementation
HNTec	9. Construction Engineering (CTN)	HCG01.4 LIFE SKILLS FOR WORKPLACE HNTEC	July 2015
	10. Information Technology (INT)	HCG01.5 LIFE SKILLS FOR WORKPLACE HNTEC	
	11. Laboratory Science (LSC)	HCG01.6 LIFE SKILLS FOR WORKPLACE HNTEC	
	12. Travel and Tourism (TRV)	HCG01.7 LIFE SKILLS FOR WORKPLACE HNTEC	
	13. Automotive Technology (AUT)	HCG01.8 LIFE SKILLS FOR WORKPLACE HNTEC	
	14. Pharmacy Technician (PHT)	HCG01.9 LIFE SKILLS FOR WORKPLACE HNTEC	
	15. Agro Technology (AGT)	HCG01.10 LIFE SKILLS FOR WORKPLACE HNTEC	July 2016
	16. Geomatics (GMT)	HCG01.11 LIFE SKILLS FOR WORKPLACE HNTEC	
	17. Design and Draughting (DDG)	HCG01.12 LIFE SKILLS FOR WORKPLACE HNTEC	
	18. Information and Library Studies (ILS)	HCG01.13 LIFE SKILLS FOR WORKPLACE HNTEC	July 2016
	19. Electronic and Media Technology (EMT)	HCG01.14 LIFE SKILLS FOR WORKPLACE HNTEC	

Level	Programme Title	Module Code/Title	Date of Implementation
HNTec	20. Aircraft Maintenance Engineering (Air Frame and Engine) (AFE)	**HCG01.15 LIFE SKILLS FOR WORKPLACE HNTEC**	July 2016
	21. Aircraft Maintenance Engineering (Avionics) (AVN)	**HCG01.15 LIFE SKILLS FOR WORKPLACE HNTEC**	
	22. Hospitality Operations (HOS/ HOP)	**HCG01.16 LIFE SKILLS FOR WORKPLACE HNTEC**	
	23. Electronic Engineering (ERE)	**HCG01.17 LIFE SKILLS FOR WORKPLACE HNTEC**	
	24. Telecommunication Systems (TCS)	**HCG01.17 LIFE SKILLS FOR WORKPLACE HNTEC**	
HNTec Appt	1. Apprenticeship in Telecommunication and Information Technology (TCI)	**HACG01.1 LIFE SKILLS FOR WORKPLACE HNTEC APPRENTICESHIP**	July 2015

No	Module Code/Title / Credit Value	Title of Programme Used	Campus	Assessment Scheme	Duration Date:
1.	**I/N/HCG03** Health Safety Security and Environment Credit Value: 15CV Passing Mark: 70%	• ISQ Marker Fitter • ISQ Scaffolder • ISQ Rigger • ISQ Welder • ISQ Heavy Vehicle Driver • ISQ Industrial Blaster Painter • ISQ Rig Crew	IBTE Mechanical Campus	Coursework: Class Tests 20% Presentation 20% Assignment 30% Examination: End Examination 30%	Endorsed: 13th Aug 2016 Expiry date: July 2020
		• HNTec in Electrical Engineering • HNTec in Construction Engineering	IBTE Nakhoda Ragam Campus		
		• HNTec in Mechanical Engineering	IBTE Sultan Bolkiah Campus		
		• NTec in Plant Engineering • HNTec in Plant Engineering • HNTec in Instrumentation and Control Engineering	IBTE Jefri Bolkiah Campus		
2	**N/H/HACG03.1** Health Safety and Environment Credit Value: 10CV Passing Mark: 70%	• NTec in Information Technology • HNTec in Information Technology	IBTE Sultan Saiful Rijal Campus (SoICT) IBTE Sultan Bolkiah Campus IBTE Jefri Bolkiah Campus	Coursework: Presentation 30% Assignment 30% Examination: End Examination 40%	Endorsed: 12th Feb 2018 Expiry date: January 2022
		• HNTec in Computer Networking	IBTE Jefri Bolkiah Campus		
		• HNTec in Electronic Engineering • HNTec in Telecommunication System • HNTec in Electronic and Media Technology • HNTec Apprenticeship in Telecommunication & Information Technology	IBTE Sultan Saiful Rijal Campus (SoA)		

No	Module Code/Title / Credit Value	Title of Programme Used	Campus	Assessment Scheme	Duration Date
3	**N/NA/HCG03.2** Health Safety and Environment Credit Value: 10CV Passing Mark: 70%	• NTec Apprenticeship in Automotive Technician • NTec in Light Vehicle Mechanic • NTec in Heavy Vehicle Mechanic • HNTec in Automobile Technology • HNTec in Automotive Engineering (RBAF)	IBTE Mechanical Campus	Coursework: Class Tests 20% Presentation 20% Assignment 30% Examination: End Examination 30%	Endorsed: 27th August 2015 Expiry date: July 2018
4	**N/HCG03.3** Health Safety and Environment Credit Value: 10CV Passing Mark: 70%	• NTec in Building Craft • HNTec in Design and Draughting • HNTec in Geomatic	IBTE Nakhoda Ragam Campus	Coursework: Class Tests 20% Presentation 20% Assignment 30% Examination: End Examination 30%	Endorsed: 19th March 2016 Expiry date: July 2018
		• HNTec in Building Services Engineering	IBTE Jefri Bolkiah Campus		
5	**N/HCG03.4** Health Safety and Environment Credit Value: 10CV Passing Mark: 70%	• NTec in Business and Administration • HNTec in Business and Finance • HNTec in Office Administration • HNTec in Office Administration Supervisory (RBAF)	IBTE Business Campus	Coursework: Class Tests 20% Presentation 20% Assignment 30% Examination: End Examination 30%	Endorsed: 16th November 2015 Expiry date: July 2018
6	**N/HCG03.6** Health Safety and Environment Credit Value: 5CV Passing Mark: 70%	• NTec in Aquaculture • NTec in Food Processing • NTec in Crop and Livestock Production • HNTec in AgroTechnology	IBTE Agro-Technology Campus	Coursework: Class Tests 20% Presentation 20% Assignment 30% Examination: End Examination 30%	Endorsed: 19th March 2016 Expiry date: July 2018
7	**N/HCG03.7** Health Safety and Environment Credit Value: 10CV Passing Mark: 70%	• HNTec in Travel & Tourism	IBTE Sultan Saiful Rijal Campus (SoHT)	Coursework: Class Tests 20% Presentation 20% Assignment 30% Examination: End Examination 30%	Endorsed: 3rd May 2016 Expiry date: July 2018

No	Module Code/Title / Credit Value	Title of Programme Used	Campus	Assessment Scheme	Duration Date:
8	**N/NA/HCG03.8** Health Safety and Environment Credit Value: 10CV Passing Mark: 70%	• NTec in Culinary Operation • NTec Apprenticeship in Professional Cookery and Services • HNTec in Hospitality Operation • NTec in Rooms Division Operation	IBTE Sultan Saiful Rijal Campus (SoHT)	Coursework: Class Tests 20% Presentation 20% Assignment 30% Examination: End Examination 30%	Endorsed: 19th March 2016 Expiry date: July 2018
9	**NACG03.9** Health Safety and Environment Credit Value: 10CV Passing Mark: 70%	NTec Apprenticeship in Refrigeration & Air-Conditioning	IBTE Sultan Bolkiah Campus	Coursework: Class Tests 20% Presentation 20% Assignment 30% Examination: End Examination 30%	Endorsed: 19th March 2018 Expiry date: August 2018
10	**N/HCG03.10** Health Safety and Environment Credit Value: 10CV Passing Mark: 70%	NTec in Electrical Technology	IBTE Nakhoda Ragam Campus	Coursework: Class Tests 20% Presentation 20% Assignment 30% Examination: End Examination 30%	Endorsed: 19th March 2016 Expiry date: August 2018
11	**NCG03.11** Health Safety and Environment Credit Value: 10CV Passing Mark: 70%	• NTec in Machining • NTec in Welding • NTec in Industrial Equipment Maintenance • NTec in Armament & Instrument Maintenance (RBAF)	IBTE Sultan Bolkiah Campus	Coursework: Class Tests 20% Presentation 20% Assignment 30% Examination: End Examination 30%	Endorsed: 23rd July 2016 Expiry date: August 2020
12	**HCG03.12** Health Safety and Environment Credit Value: 10CV Passing Mark: 70%	• HNTec in Information Library Studies	IBTE Sultan Saiful Rijal Campus (SoICT)	Coursework: Class Tests 20% Presentation 20% Assignment 30% Examination: End Examination 30%	Endorsed: 23rd July 2016 Expiry date: August 2020

Appendix 14

Module Title	Module code	Endorsed Date	Module Expiry Date	Assessment Schemes	IBTE Programmes
Fundamental Engineering Science	ICG05.1 **In TVESIS** ICG05.1[ed2]	04/02/2016	**July 2018**	**Coursework**: Short Test – 20% **Laboratory/Practical Work**: Practical 1 – 15% Practical 2 – 15% Practical 3 – 20% **Examination**: End Examination – 30%	▪ ISQ in Heavy Vehicle Driver Class 5, April 2015 (Endorsed: 15/10/2016) ▪ ISQ in Marker/Fitter, Sept 2016 ▪ ISQ in Scaffolder, Sept 2016 ▪ ISQ in Welder, Sept 2016 ▪ ISQ in Rigger, Sept 2016 (Endorsed: 22/10/2016)
Basic Engineering Science	NCG05 **In TVESIS** NCG05[ed2]	16/03/2016	**July 2018**	**Laboratory/Practical Work**: Practical 1 – 20% Practical 2 – 25% Practical 3 – 25% **Examination**: End Examination – 30%	▪ NTec in Electrical Technology, July 2015 (Endorsed PG: 29/10/2016) ▪ NTec in Machining, July 2016 (Endorsed PG: 23/07/2016) ▪ NTec in Welding, July 2016 (Endorsed PG: 18/06/2016) ▪ NTec in Industrial Equipment Maintenance, July 2016 (Endorsed PG: 23/07/2016) ▪ NTec in Armament & Industrial Maintenance, July 2016 (Endorsed PG: 20/08/2016) ▪ NTec in Building Craft, July 2016 (Endorsed PS: 17/09/2016)

Appendix 14

Module Title	Module code	Endorsed Date	Module Expiry Date	Assessment Schemes	IBTE Programmes
Engineering Science (CV 10)	HCG05.3 **In TVESIS** HCG05.3[ed2]	04/02/2016 & 20/06/2016	**July 2018**	**Laboratory/Practical Work:** Practical 1 – 20% Practical 2 – 25% Practical 3 – 25% **Examination:** End Examination – 30%	▪ HNTec in Mechanical Engineering, July 2016 (Endorsed PG: 13/08/2016) ▪ HNTec in Construction Engineering, July 2015 (Endorsed PG: 20/08/2016) ▪ HNTec in Building Service Engineering, July
Engineering Science (CV 5)	HCG05.3 **In TVESIS** HCG05.3[ed3]				▪ HNTec in Automobile Technology, July 2015 (Endorsed PG: 09/08/2016) ▪ HNTec in Plant Engineering, July 2016 (Endorsed PG: 13/08/2016) ▪ HNTec in Instrumentation and Control Engineering, July 2016 (Endorsed PG: ▪ HNTec in Electrical Engineering, July 2016 (Endorsed PG: 09/11/2016)

Appendix 14

Module Title	Module code	Endorsed Date	Module Expiry Date	Assessment Schemes	IBTE Programmes
Engineering Science	HCG05.4	08/10/2016		**Laboratory/Practical Work**: Practical 1 – 20% Practical 2 – 25% Practical 3 – 25% **Examination**: End Examination – 30%	▪ HNTec in Electronic and Media Technology, July 2016 (Endorsed PG: 31/12/2016)
Engineering Science	HCG05.5	08/10/2016		**Laboratory/Practical Work**: Practical 1 – 20% Practical 2 – 25% Practical 3 – 25% **Examination**: End Examination – 30%	▪ HNTec in Electronic Engineering, July 2016 (Endorsed PG: 31/12/2016)
Engineering Science	HCG05.6	22/10/2016		**Laboratory/Practical Work**: Practical 1 – 20% Practical 2 – 25% Practical 3 – 25% **Examination**: End Examination – 30%	▪ HNTec in Geomatics, July 2016 (Endorsed PS: 31/12/2016)

No	Module Code/Title / Credit Value	Title of Programme Used	Campus	Assessment Scheme	Duration Date:
1.	**N/HCG06** Flow Scheme/Drawing Credit Value: 5CV Passing Mark: 50%	• HNTec in Electrical Engineering	IBTE Nakhoda Ragam Campus	Coursework: Oral Test 20% Assignment 50% Examination: End Examination 30%	Endorsed: 5th Nov 2016 Expiry date: July 2020
		• HNTec in Mechanical Engineering	IBTE Sultan Bolkiah Campus		
		• HNTec in Plant Engineering	IBTE Jefri Bolkiah Campus		

No	Module Code/Title / Credit Value	Title of Programme Used	Campus	Assessment Scheme	Duration Date:
1.	**I/N/HCG04** Introduction to Oil and Gas Industry Credit Value: 5CV Passing Mark: 50%	• ISQ Marker Fitter • ISQ Scaffolder • ISQ Rigger • ISQ Welder • ISQ Heavy Vehicle Driver • ISQ Industrial Blaster Painter • ISQ Rig Crew	IBTE Mechanical Campus	Coursework: Presentation 25% Assignment 25% Examination: End Examination 50%	Endorsed: 13th Aug 2016 Expiry date: July 2020
		• HNTec in Electrical Engineering	IBTE Nakhoda Ragam Campus		
		• HNTec in Mechanical Engineering	IBTE Sultan Bolkiah Campus		
		• NTec in Plant Engineering • HNTec in Plant Engineering • HNTec in Instrumentation and Control Engineering	IBTE Jefri Bolkiah Campus		