COMPETENCY STANDARDS

CLOUD INFRASTRUCTURE TECHNICAL SERVICES LEVEL III

INFORMATION AND COMMUNICATIONS TECHNOLOGY

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
TESDA Complex East Service Road, South Luzon Expressway (SLEX),
Fort Bonifacio, Taguig City

TABLE OF CONTENTS

INFORMATION AND COMMUNICATION TECHNOLOGY SECTOR

CLOUD INFRASTRUCTURE TECHNICAL SERVICES LEVEL III

COMPETENCY STANDARDS FOR
CLOUD INFRASTRUCTURE TECHNICAL SERVICES LEVEL III

Section 1 DEFINITION OF QUALIFICATION

The **Cloud Infrastructure Technical Services Level III** Qualification consists of competencies that a person must achieve to provide provisioning of cloud infrastructure resources, manage access permissions in the cloud environment, configure cloud resources monitoring services, implement backup and recovery plans, and troubleshoot cloud infrastructure issues.

The units of competency comprising this qualification include the following:

UNIT CODE	BASIC COMPETENCIES
400311319	Lead workplace communication
400311320	Lead small teams
400311321	Apply critical thinking and problem-solving techniques in the workplace
400311322	Work in a diverse environment
400311323	Propose methods of applying learning and innovation in the organization
400311324	Use information systematically
400311325	Evaluate occupational safety and health work practices
400311326	Evaluate environmental work practices
400311327	Facilitate entrepreneurial skills for micro-small-medium enterprises (MSMEs)

UNIT CODE	COMMON COMPETENCIES
ICT315202	Apply Quality Standards
ICT311203	Perform Computer Operations

UNIT CODE	CORE COMPETENCIES
AB-ICT1381200133301	Conduct provisioning of cloud infrastructure resources
AB-ICT1381200133302	Manage access permissions in the cloud environment
AB-ICT1381200133303	Configure cloud resources monitoring services
AB-ICT1381200133304	Implement Backup and Recovery Plans
AB-ICT1381200133305	Troubleshoot cloud infrastructure issues

A person who has achieved this Qualification is competent to be:

- Cloud Infrastructure Specialist (Mid-Level)
- Cloud Specialist (Mid-Level)
- Cloud Support Specialist (Mid-Level)

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the units of competency required in **CLOUD INFRASTRUCTURE TECHNICAL SERVICES LEVEL III.**

BASIC COMPETENCIES

UNIT OF COMPETENCY : **LEAD WORKPLACE COMMUNICATION**

UNIT CODE : **400311319**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to lead in the effective dissemination and discussion of ideas, information, and issues in the workplace. This includes preparation of written communication materials..

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1.Communicate information about workplace processes	1.1. Relevant ***communication method*** is selected based on workplace procedures. 1.2. Multiple operations involving several topics/areas are communicated following enterprise requirements. 1.3. Questioning is applied to gain extra information. 1.4. Relevant sources of information are identified in accordance with workplace/client requirements. 1.5. Information is selected and organized following enterprise procedures. 1.6. Verbal and written reporting is undertaken when required.	1.1. Organization requirements for written and electronic communication methods 1.2. Effective verbal communication methods 1.3. Business writing 1.4. Workplace etiquette	1.1. Organizing information 1.2. Conveying intended meaning 1.3. Participating in variety of workplace discussions 1.4. Complying with organization requirements for the use of written and electronic communication methods 1.5. Effective business writing 1.6. Effective clarifying and probing skills 1.7. Effective questioning techniques (clarifying and probing)

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	1.7. Communication and negotiation skills are applied and maintained in all relevant situations.		
2. Lead workplace discussions	2.1 Response to workplace issues are sought following enterprise procedures. 2.2 Response to workplace issues are provided immediately. 2.3 Constructive contributions are made to workplace discussions on such issues as production, quality and safety. 2.4 Goals/ objectives and action plans undertaken in the workplace are communicated promptly.	2.1 Organization requirements for written and electronic communication methods 2.2 Effective verbal communication methods 2.3 Workplace etiquette	2.1 Organizing information 2.2 Conveying intended meaning 2.3 Participating in variety of workplace discussions 2.4 Complying with organization requirement s for the use of written and electronic communication methods 2.5 Effective clarifying and probing skills
3. Identify and communicate issues arising in the workplace	3.1 Issues and problems are identified as they arise 3.2 Information regarding problems and issues are organized coherently to ensure clear and effective communication 3.3 Dialogue is initiated with appropriate	3.1. Organization requirements for written and electronic communication methods 3.2. Effective verbal communication methods 3.3. Workplace etiquette 3.4. Communication problems and	3.1. Organizing information 3.2. Conveying intended meaning 3.3. Participating in a variety of workplace discussions 3.4. Complying with organization requirements for the use of written and electronic

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	personnel 3.4 Communication problems and issues are raised as they arise	issues 3.5. Barriers in communication	communication methods 3.5. Effective clarifying and probing skills 3.6. Identifying issues 3.7. Negotiation and communication skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Communication method	May include: 1.1. Non-verbal gestures 1.2. Verbal 1.3. Face to face 1.4. Two-way radio 1.5. Speaking to groups 1.6. Using telephone 1.7. Written 1.8. Internet

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Dealt with a range of communication/information at one time 1.2 Demonstrated leadership skills in workplace communication 1.3 Made constructive contributions in workplace issues 1.4 Sought workplace issues effectively 1.5 Responded to workplace issues promptly 1.6 Presented information clearly and effectively written form 1.7 Used appropriate sources of information 1.8 Asked appropriate questions 1.9 Provided accurate information
2. Resource Implications	The following resources should be provided: 2.1. Variety of Information 2.2. Communication tools 2.3. Simulated workplace
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Third-party report 3.2 Portfolio 3.3 Interview 3.4 Demonstration/Role-playing
4. Context for Assessment	4.1. Competency may be assessed in the workplace or in simulated workplace environment

UNIT OF COMPETENCY : LEAD SMALL TEAMS

UNIT CODE : 400311320

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes to lead small teams including setting, maintaining and monitoring team and individual performance standards.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Provide team leadership	1.1 ***Work requirements*** are identified and presented to team members 1.2 Reasons for instructions and requirements are communicated to team members based on company policies and procedures. 1.3 ***Team members' queries and concerns*** are recognized, discussed and dealt with based on company practices.	1.1. Facilitation of Team work 1.2. Company policies and procedures relating to work performance 1.3. Performance standards and expectations 1.4. Performance standards and expectations	1.1. Communication skills required for leading teams 1.2. Group facilitation skills 1.3. Negotiating skills 1.4. Setting performance expectation
2. Assign responsibilities	2.1. Duties and responsibilities are allocated having regard to the skills, knowledge and aptitude required to properly undertake the assigned task and according to company policy 2.2. Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible	2.1. Work plan and procedures 2.2 Work requirements and targets 2.3 Individual and group expectations 2.4 Ways to improve group leadership and membership	2.1. Communication skills 2.2. Management skills responsibilities 2.3. Negotiating skills 2.4. Evaluation skills 2.5. Identifying team member's strengths and rooms for improvement
3. Set	3.1 Performance	3.1 One's roles and	3.1 Communication

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
performance expectations for team members	expectations are established based on client needs and according to assignment requirements 3.2 Performance expectations are based on individual team member's duties and area of responsibility 3.3 Performance expectations are discussed and disseminated to individual team members	responsibilities in the team 3.2 Feedback giving and receiving 3.3 Performance expectation	skills 3.2 Accurate empathy 3.3 Congruence 3.4 Unconditional positive regard 3.5 Handling of Feedback
4. Supervise team performance	4.1. ***Monitor performance*** based on defined performance criteria and/or assignment instruction. 4.2 Team members are provided with ***feedback***, positive support and advice on strategies to overcome any deficiencies based on company practices. 4.3 ***Performance issues*** which cannot be rectified or addressed within the team are referred to appropriate personnel according to employer policy. 4.4 Team members are kept informed of any changes in the priority allocated to assignments or	4.1 Performance Coaching 4.2 Performance management 4.3 Performance Issues	4.1 Communication skills required for leading teams 4.2 Coaching skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	tasks which might impact on client/customer needs and satisfaction. 4.5 Team operations are monitored to ensure that employer/client needs and requirements are met. 4.6 Follow-up communication is provided on all issues affecting the variables team 4.7 All relevant documentation is completed in accordance with company procedures		

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work requirements	May include: 1.1. Client Profile 1.2. Assignment instructions
2. Team member's queries and concerns	May include: 2.1 Roster/shift details
3. Monitor performance	May include: 3.1 Formal process 3.2 Informal process
4. Feedback	May include: 4.1. Formal process 4.2. Informal process
5. Performance issues	May include: 5.1 Work output 5.2 Work quality 5.3 Team participation

	5.4 Compliance with workplace protocols 5.5 Safety 5.6 Customer service

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Maintained or improved individuals and/or team performance given a variety of possible scenario 1.2. Assessed and monitored team and individual performance against set criteria 1.3. Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf 1.4. Allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed 1.5. Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members
2. Resource Implications	The following resources should be provided: 2.1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2. Materials relevant to the proposed activity or task
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1. Written Examination 3.2. Oral Questioning 3.3. Portfolio
4. Context for Assessment	4.1. Competency may be assessed in the actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : **APPLY CRITICAL THINKING AND PROBLEM-SOLVING TECHNIQUES IN THE WORKPLACE**

UNIT CODE : **400311321**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to solve problems in the workplace including the application of problem solving techniques and to determine and resolve the root cause/s of specific problems in the workplace.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Examine specific workplace challenges	1.1 Variances are examined from normal operating ***parameters***; and product quality. 1.2 Extent, cause and nature of the specific problem are defined through observation, investigation and ***analytical techniques***. 1.3 ***Problems*** are clearly stated and specified.	1.1. Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize nonstandard situations. 1.2. Competence to include the ability to apply and explain, enough for the identification of fundamental causes of specific workplace challenges. 1.3. Relevant equipment and operational processes. 1.4. Enterprise goals, targets and measures 1.5. Enterprise quality OHS and environmental requirement. 1.6. Enterprise information systems and data collation.	1.1. Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 1.2. Identifying extent and causes of specific challenges in the workplace.

		1.7 Industry codes and standards.	
2. Analyze the causes of specific workplace challenges	2.1 Possible causes of specific problems are identified based on experience and the use of problem solving tools / analytical techniques. 2.2 Possible cause statements are developed based on findings. 2.3 Fundamental causes are identified per results of investigation conducted.	2.1. Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non standard situations. 2.2. Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations. 2.3. Relevant equipment and operational processes. 2.4. Enterprise goals, targets and measures.	2.1 Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 2.2 Identifying extent and causes of specific challenges in the workplace. 2.3 Providing clear cut findings on the nature of each identified workplace challenges.

		2.5. Enterprise quality OSH and environmental requirement. 2.6. Enterprise information systems and data collation. 2.7. Industry codes and standards.	
3. Formulate resolutions to specific workplace challenges	3.1. All possible options are considered for resolution of the problem. 3.2 Strengths and weaknesses of possible options are considered. 3.3. Corrective actions are determined to resolve the problem and possible future causes. 3.4 ***Action plans*** are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures	3.1. Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations. 3.2. Relevant equipment and operational processes. 3.3. Enterprise goals, targets and measures. 3.4. Enterprise quality OSH and environmental requirement. 3.5. Principles of decision making strategies and techniques. 3.6. Enterprise information systems and data collation. 3.7. Industry codes and standards.	3.1. Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 3.2. Identifying extent and causes of specific challenges in the workplace. 3.3. Providing clear cut findings on the nature of each identified workplace challenges. 3.4. Devising, communicating, implementing and evaluating strategies and techniques in addressing specific

			workplace challenges.
4. Implement action plans and communicate results	4.1. Action plans are implemented and evaluated. 4.2 Results of plan implementation and recommendations are prepared. 4.3. Recommendations are presented to appropriate personnel. 4.4. Recommendations are followed-up, if required.	4.1. Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations 4.2. Relevant equipment and operational processes. 4.3. Enterprise goals, targets and measures. 4.4. Enterprise quality, OSH and environmental requirement 4.5. Principles of decision making strategies and techniques 4.6. Enterprise information systems and data collation 4.7. Industry codes and standards	4.1. Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 4.2. Identifying extent and causes of specific challenges in the workplace. 4.3. Providing clear cut findings on the nature of each identified workplace challenges. 4.4. Devising, communicating, implementing and evaluating strategies and techniques in addressing specific

			workplace challenges.

RANGE OF VARIABLES

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Examined specific workplace challenges. 1.2. Analyzed the causes of specific workplace challenges. 1.3. Formulated resolutions to specific workplace challenges. 1.4. Implemented action plans and communicated results on specific workplace challenges.
2. Resource Implications	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios / case studies / what ifs will be required as well as bank of questions which will be used to probe the reason behind the observable action.

3. Methods of Assessment	Competency in this unit may be assessed through: 3.1. Observation 3.2. Case Formulation 3.3. Life Narrative Inquiry 3.4. Standardized test The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.
4. Context for Assessment	In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

UNIT OF COMPETENCY : **WORK IN A DIVERSE ENVIRONMENT**

UNIT CODE : **400311322**

UNIT DESCRIPTOR : This unit covers the outcomes required to work effectively in a workplace characterized by diversity in terms of religions, beliefs, races, ethnicities and other differences.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Develop an individual's cultural awareness and sensitivity	1.1. Individual differences with clients, customers and fellow workers are recognized and respected in accordance with enterprise policies and core values. 1.2. Differences are responded to in a sensitive and considerate manner 1.3. ***Diversity*** is accommodated using appropriate verbal and non verbal communication***.***	1.1. Understanding cultural diversity in the workplace 1.2 Norms of behavior for interacting and dialogue with specific groups (e. g., Muslims and other non Christians, non Catholics, tribes/ethnic groups, foreigners) 1.3 Different methods of verbal and non verbal communication in a multicultural setting	1.1 Applying cross cultural communication skills (i.e. different business customs, beliefs, communication strategies) 1.2 Showing affective skills – establishing rapport and empathy, understanding, etc. 1.3 Demonstrating openness and flexibility in communication 1.4 Recognizing diverse groups in the workplace and community as defined by divergent culture, religion, traditions and practices

2. Work effectively in an environment that acknowledges and values cultural diversity	2.1. Knowledge, skills and experiences of others are recognized and documented in relation to team objectives. 2.2. Fellow workers are encouraged to utilize and share their specific qualities, skills or backgrounds with other team members and clients to enhance work outcomes. 2.3. Relations with customers and clients are maintained to show that diversity is valued by the business.	2.1 Value of diversity in the economy and society in terms of Workforce development 2.2 Importance of inclusiveness in a diverse 2.3 Shared vision and understanding of and commitment to team, departmental, and organizational goals and objectives 2.4 Strategies for customer service excellence	2.1 Demonstrating cross cultural communication skills and active listening. 2.2. Recognizing diverse groups in the workplace and community as defined by divergent culture, religion, traditions and practices. 2.3 Demonstrating collaboration skills. 2.4. Exhibiting customer service excellence
3. Identify common issues in a multicultural and diverse environment	3.1. ***Diversity-related conflicts*** within the workplace are effectively addressed and resolved. 3.2. Discriminatory behaviors towards customers/stakeholders are minimized and addressed accordingly. 3.3. Change management policies are in place within the organization.	3.1. Value, and leverage of cultural diversity. 3.2. Inclusivity and conflict resolution 3.3. Workplace harassment 3.4. Change management and ways to overcome resistance to change. 3.5. Advanced strategies for customer service excellence	3.1. Addressing diversity-related conflicts in the workplace 3.2. Eliminating discriminatory behavior towards customers and co workers 3.3. Utilizing change management policies in the workplace

RANGE OF VARIABLES

VARIABLE	RANGE
1. Diversity	This refers to diversity in both the workplace and the community and may include divergence in : 1.1 Religion 1.2 Ethnicity, race or nationality 1.3 Culture 1.4 Gender, age or personality 1.5 Educational background
2. Diversity-related conflicts	May include conflicts that result from: 2.1 Discriminatory behaviors 2.2 Differences of cultural practices 2.3 Differences of belief and value systems 2.4 Gender-based violence 2.5 Workplace bullying 2.6 Corporate jealous 2.7 Language barriers 2.8 Individuals being differently-abled persons 2.9 Ageism (negative attitude and behavior towards old people)

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Adjusted language and behavior as required by interactions with diversity 1.2 Identified and respected individual differences in colleagues, clients and customers 1.3 Applied relevant regulations, standards and codes of practice
2. Resource Implications	The following resources should be provided: 2.1 Access to workplace and resources 2.2 Manuals and policies on Workplace Diversity
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Demonstration or simulation with oral questioning 3.2 Group discussions and interactive activities 3.3 Case studies/problems involving workplace diversity issues 3.4 Third-party report 3.5 Written examination 3.6 Role Plays
4. Context for Assessment	In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

UNIT OF COMPETENCY : PROPOSE METHODS OF APPLYING LEARNING AND INNOVATION IN THE ORGANIZATION

UNIT CODE : 400311323

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to assess general obstacles in the application of learning and innovation in the organization and to propose practical methods of such in addressing organizational challenges.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Assess work procedures, processes and systems in terms of innovative practices	1.1 ***Reasons for innovations*** are incorporated to work procedures. 1.2 ***Models of innovations*** are researched. 1.3 ***Gaps or barriers to innovations*** in one's work area are analyzed. 1.4 Staff who can support and foster innovation in the work procedure are identified.	1.1 Seven habits of highly effective people. 1.2 Character strengths that foster innovation and learning (Christopher Peterson and Martin Seligman, 2004) 1.3 Five minds of the future concepts (Gardner, 2007). 1.4 Adaptation concepts in neuroscience (Merzenich, 2013). 1.5 Trans theoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	1.1 Demonstrating collaboration and networking skills. 1.2 Applying basic research and evaluation skills 1.3 Generating insights on how to improve organizational procedures, processes and systems through innovation.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Generate practical action plans for improving work procedures, processes	2.1 Ideas for innovative work procedure to foster innovation using individual and group techniques are conceptualized 2.2 Range of ideas with other team members and colleagues are evaluated and discussed 2.3 Work procedures and processes subject to change are selected based on workplace requirements (feasible and innovative). 2.4 Practical action plans are proposed to facilitate simple changes in the work procedures, processes and systems. 2.5 ***Critical inquiry*** is applied and used to facilitate discourse on adjustments in the simple work procedures, processes and systems.	2.1 Seven habits of highly effective people. 2.2 Character strengths that foster innovation and learning (Christopher Peterson and Martin Seligman, 2004) 2.3 Five minds of the future concepts (Gardner, 2007). 2.4 Adaptation concepts in neuroscience (Merzenich, 2013). 2.5 Trans theoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	2.1 Assessing readiness for change on simple work procedures, processes and systems. 2.2 Generating insights on how to improve organizational procedures, processes and systems through innovation. 2.3 Facilitating action plans on how to apply innovative procedures in the organization.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Evaluate the effectiveness of the proposed action plans	3.1 Work structure is analyzed to identify the impact of the new work procedures 3.2 Co-workers/key personnel are consulted to know who will be involved with or affected by the work procedure 3.3 Work instruction operational plan of the new work procedure is developed and evaluated. 3.4 Feedback and suggestions are recorded. 3.5 Operational plan is updated. 3.6 Results and impact on the developed work instructions are reviewed 3.7 Results of the new work procedure are evaluated 3.8 Adjustments are recommended based on results gathered	3.1 Five minds of the future concepts (Gardner, 2007). 3.2 Adaptation concepts in neuroscience (Merzenich, 2013). 3.3 Trans theoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992)	3.1 Generating insights on how to improve organizational procedures, processes and systems through innovation. 3.2 Facilitating action plans on how to apply innovative procedures in the organization. 3.3 Communicating results of the evaluation of the proposed and implemented changes in the workplace procedures and systems. 3.4 Developing action plans for continuous improvement on the basic systems, processes and procedures in the organization.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Reasons for innovations	May include: 1.1 Strengths and weaknesses of the current systems, processes and procedures. 1.2 Opportunities and threats of the current systems, processes and procedures.

2. Models of innovation	May include: 2.1 Seven habits of highly effective people. 2.2 Five minds of the future concepts (Gardner, 2007). 2.3 Neuroplasticity and adaptation strategies.
3. Gaps or barriers to innovations	May include: 3.1 Machine 3.2 Manpower 3.3 Methods 3.4 Money
4. Critical Inquiry	May include: 4.1 Preparation. 4.2 Discussion. 4.3 Clarification of goals. 4.4 Negotiate towards a Win-Win outcome. 4.5 Agreement. 4.6 Implementation of a course of action. 4.7 Effective verbal communication. See our pages: Verbal Communication and Effective Speaking. 4.8 Listening. 4.9 Reducing misunderstandings is a key part of effective negotiation. 4.10 Rapport Building. 4.11 Problem Solving. 4.12 Decision Making. 4.13 Assertiveness. 4.14 Dealing with Difficult Situations..

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Established the reasons why innovative systems are required 1.2 Established the goals of a new innovative system 1.3 Analyzed current organizational systems to identify gaps and barriers to innovation. 1.4 Assessed work procedures, processes and systems in terms of innovative practices. 1.5 Generate practical action plans for improving work procedures, and processes. 1.6 Reviewed the trial innovative work system and adjusted reflect evaluation feedback, knowledge management systems and future planning. 1.7 Evaluated the effectiveness of the proposed action plans.
2. Resource Implications	The following resources should be provided: 2.1 Pens, papers and writing implements. 2.2 Cartolina. 2.3 Manila papers

3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Psychological and behavioral Interviews. 3.2 Performance Evaluation. 3.3 Life Narrative Inquiry. 3.4 Review of portfolios of evidence and third-party workplace reports of on-the-job performance. 3.5 Sensitivity analysis. 3.6 Organizational analysis. 3.7 Standardized assessment of character strengths and virtues applied.
4. Context for Assessment	4.1. Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.

UNIT OF COMPETENCY : USE INFORMATION SYSTEMATICALLY

UNIT CODE : 400311324

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to use technical information systems, apply information technology (IT) systems and edit, format & check information.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Use technical information	1.1. ***Information*** are collated and organized into a suitable form for reference and use 1.2. Stored information are classified so that it can be quickly identified and retrieved when needed 1.3. Guidance are advised and offered to people who need to find and use information	1.1. Application in collating information 1.2. Procedures for inputting, maintaining and archiving information 1.3. Guidance to people who need to find and use information 1.4. Organize information 1.5. classify stored information for identification and retrieval 1.6. Operate the technical information system by using agreed procedures	1.1. Collating information 1.2. Operating appropriate and valid procedures for inputting, maintaining and archiving information 1.3. Advising and offering guidance to people who need to find and use information 1.4. Organizing information into a suitable form for reference and use 1.5. Classifying stored information for identification and retrieval 1.6. Operating the technical information system by using agreed procedures
2. Apply information technology (IT)	2.1. ***Technical information*** system is operated using agreed procedures 2.2. Appropriate and valid procedures are operated for inputting, maintaining and	2.1. Attributes and limitations of available software tools 2.2. Procedures and work instructions for the use of IT 2.3. Operational requirements for	2.1. Identifying attributes and limitations of available software tools 2.2. Using procedures and work instructions for the use of IT

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	archiving information 2.3. ***Software*** required are utilized to execute the project activities 2.4. Information and data obtained are handled, edited, formatted and checked from a range of internal and external ***sources*** 2.5. Information are extracted, entered, and processed to produce the outputs required by ***customers*** 2.6. Own skills and understanding are shared to help others 2.7. Specified s***ecurity measures*** are implemented to protect the confidentiality and integrity of project data held in IT systems	IT systems 2.4. Sources and flow paths of data 2.5. Security systems and measures that can be used 2.6. Extract data and format reports 2.7. Methods of entering and processing information 2.8. WWW enabled applications	2.3. Describing operational requirements for IT systems 2.4. Identifying sources and flow paths of data 2.5. Determining security systems and measures that can be used 2.6. Extracting data and format reports 2.7. Describing methods of entering and processing information 2.8. Using WWW applications
3. Edit, format and check information	3.1 Basic editing techniques are used 3.2 Accuracy of documents are checked 3.3 Editing and formatting tools and techniques are used for more complex documents 3.4 Proofreading techniques is used to check that documents look professional	3.1 Basic file handling Techniques 3.2 Techniques in checking documents 3.3 Techniques in editing and formatting 3.4 Proofreading techniques	3.1 Using basic file handling techniques is used for the software 3.2 Using different techniques in checking documents 3.3 Applying editing and formatting techniques 3.4 Applying proof reading techniques

RANGE OF VARIABLES

VARIABLE	RANGE
1. Information	May include: 1.1. Property 1.2. Organizational 1.3. Technical reference
2. Technical information	May include: 2.1. paper based 2.2. electronic
3. Software	May include: 3.1. spreadsheets 3.2. databases 3.3. word processing 3.4. presentation
4. Sources	May include: 4.1. other IT systems 4.2. manually created 4.3. within own organization 4.4. outside own organization 4.5. geographically remote
5. Customers	May include: 5.1. colleagues 5.2. company and project management 5.3. clients
6. Security Measures	May include: 6.1. access rights to input; 6.2. passwords; 6.3. access rights to outputs; 6.4. data consistency and back-up; 6.5. recovery plans

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Used technical information systems and information technology 1.2. Applied information technology (IT) systems 1.3. Edited, formatted and checked information
2. Resource Implications	**The following resources should be provided:** 2.1. Computers 2.2. Software and IT system

3. Methods of Assessment	**Competency in this unit should be assessed through:** 3.1. Direct Observation 3.2. Oral interview and written test
4. Context for Assessment	4.1. Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : EVALUATE OCCUPATIONAL SAFETY AND HEALTH WORK PRACTICES

UNIT CODE : 400311325

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to interpret Occupational Safety and Health practices, set OSH work targets, and evaluate effectiveness of Occupational Safety and Health work instructions

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Interpret Occupational Safety and Health practices	1.1 ***OSH work practices issues*** are identified relevant to work requirements 1.2 OSH work standards and procedures are determined based on applicability to nature of work 1.3 Gaps in work practices are identified related to relevant OSH work standards	1.1. OSH work practices issues 1.2. OSH work standards 1.3. General OSH principles and legislations 1.4. Company/ workplace policies/ guidelines 1.5. Standards and safety requirements of work process and procedures	1.1. Communication skills 1.2. Interpersonal skills 1.3. Critical thinking skills 1.4. Observation skills
2. Set OSH work targets	2.1 Relevant work information are gathered necessary to determine OSH work targets 2.2 ***OSH indicators*** based on gathered information are agreed upon to measure effectiveness of workplace OSH policies and procedures 2.3 Agreed OSH indicators are endorsed for approval from appropriate personnel	2.1. OSH work targets 2.2. OSH Indicators 2.3. OSH work instructions 2.4. Safety and health requirements of tasks 2.5. Workplace guidelines on providing feedback on OSH and security concerns 2.6. OSH regulations Hazard control procedures 2.7. OSH trainings relevant to work	2.1. Communication skills 2.2. Collaborating skills 2.3. Critical thinking skills 2.4. Observation skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.4 ***OSH work instructions*** are received in accordance with workplace policies and procedures*		
3. Evaluate effectiveness of Occupational Safety and Health work instructions	3.1 OSH Practices are observed based on workplace standards 3.2 Observed OSH practices are measured against approved ***OSH metrics*** 3.3 Findings regarding effectiveness are assessed and gaps identified are implemented based on OSH work standards	3.1. OSH Practices 3.2. OSH metrics 3.3. OSH Evaluation Techniques 3.4. OSH work standards	3.1. Critical thinking skills 3.2. Evaluating skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. OSH Work Practices Issues	May include: 1.1 Workers' experience/observance on presence of work hazards 1.2 Unsafe/unhealthy administrative arrangements (prolonged work hours, no break-time, constant overtime, scheduling of tasks) 1.3 Reasons for compliance/non-compliance to use of PPEs

	or other OSH procedures/policies/ guidelines
2. OSH Indicators	May include: 2.1 Increased of incidents of accidents, injuries 2.2 Increased occurrence of sickness or health complaints/symptoms 2.3 Common complaints of workers related to OSH 2.4 High absenteeism for work-related reasons
3. OSH Work Instructions	May include: 3.1 Preventive and control measures, and targets 3.2 Eliminate the hazard (i.e., get rid of the dangerous machine 3.3 Isolate the hazard (i.e. keep the machine in a closed room and operate it remotely; barricade an unsafe area off) 3.4 Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one) 3.5 Use administrative controls to reduce the risk (i.e. give trainings on how to use equipment safely; OSH-related topics, issue warning signage, rotation/shifting work schedule) 3.6 Use engineering controls to reduce the risk (i.e. use safety guards to machine) 3.7 Use personal protective equipment 3.8 Safety, Health and Work Environment Evaluation 3.9 Periodic and/or special medical examinations of workers
4. OSH metrics	May include: 4.1 Statistics on incidence of accidents and injuries 4.2 Morbidity (Type and Number of Sickness) 4.3 Mortality (Cause and Number of Deaths) 4.4 Accident Rate

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Identify OSH work practices issues relevant to work requirements 1.2. Identify gaps in work practices related to relevant OSH work standards 1.3. Agree upon OSH Indicators based on gathered information to measure effectiveness of workplace OSH policies and procedures 1.4. Receive OSH work instructions in accordance with workplace policies and procedures 1.5. Compare Observed OSH practices with against approved OSH work instructions 1.6. Assess findings regarding effectiveness based on OSH work standards

2. Resource Implications	The following resources should be provided: 2.1 Facilities, materials, tools and equipment necessary for the activity
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Observation/Demonstration with oral questioning 3.2 Third party report 3.3 Written exam
4. Context for Assessment	4.1 Competency may be assessed in the workplace or in a simulated workplace setting

UNIT OF COMPETENCY : EVALUATE ENVIRONMENTAL WORK PRACTICES

UNIT CODE : 400311326

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude to interpret environmental Issues, establish targets to evaluate environmental practices and evaluate effectiveness of environmental practices.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Interpret environmental practices, policies and procedures	1.1 ***Environmental work practices*** issues are identified relevant to work requirements 1.2 Environmental Standards and Procedures nature of work are determined based on Applicability to nature of work 1.3 Gaps in work practices related to Environmental Standards and Procedures are identified	1.1 Environmental Issues 1.2 Environmental Work Procedures 1.3 Environmental Laws 1.4 Environmental Hazardous and Non-Hazardous Materials 1.5 Environmental required license, registration or certification	1.1. Analyzing Environmental Issues and Concerns 1.2. Critical thinking 1.3. Problem Solving 1.4. Observation Skills

2. Establish targets to evaluate environmental practices	2.1. Relevant information is gathered necessary to determine environmental work targets 2.2. ***Environmental indicators*** based on gathered information are set to measure environmental work targets 2.3. Indicators are verified with appropriate personnel	2.1. Environmental indicators 2.2. Relevant Environment Personnel or expert 2.3. Relevant Environmental Trainings and Seminars	2.1. Investigative Skills 2.2. Critical thinking 2.3. Problem Solving 2.4. Observation Skills
3. Evaluate effectiveness of environmental practices	3.1. Work environmental practices are recorded based on workplace standards 3.2. Recorded work environmental practices are compared against planned indicators 3.3. Findings regarding effectiveness are assessed and gaps identified are implemented based on environment work standards and procedures 3.4. Results of environmental assessment are conveyed to appropriate personnel	3.1 Environmental Practices 3.2 Environmental Standards and Procedures	3.1 Documentation and Record Keeping Skills 3.2 Critical thinking 3.3 Problem Solving 3.4 Observation Skills

RANGE OF VARIABLES

VARIABLE	RANGE

1. Environmental Work Practices Issues	May include: 1.1 Water Quality 1.2 National and Local Government Issues 1.3 Safety 1.4 Endangered Species 1.5 Noise 1.6 Air Quality 1.7 Historic 1.8 Waste 1.9 Cultural
2. Environmental Indicators	May include: 2.1 Noise level 2.2 Lighting (Lumens) 2.3 Air Quality - Toxicity 2.4 Thermal Comfort 2.5 Vibration 2.6 Radiation 2.7 Quantity of the Resources 2.8 Volume

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Identified environmental issues relevant to work requirements 1.2. Identified gaps in work practices related to Environmental Standards and Procedures 1.3. Gathered relevant information necessary to determine environmental work targets 1.4. Set environmental indicators based on gathered information to measure environmental work targets 1.5. Recorded work environmental practices are recorded based on workplace standards 1.6. Conveyed results of environmental assessment to appropriate personnel
2. Resource Implications	The following resources should be provided: 2.1 Workplace/Assessment location 2.2 Legislation, policies, procedures, protocols and local ordinances relating to environmental protection 2.3 Case studies/scenarios relating to environmental protection

3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Written/ Oral Examination 3.2 Interview/Third Party Reports 3.3 Portfolio (citations/awards from GOs and NGOs, certificate of training – local and abroad) 3.4 Simulations and role-plays
4. Context for Assessment	4.1 Competency may be assessed in the actual workplace or at the designated TESDA center.

UNIT OF COMPETENCY : FACILITATE ENTREPRENEURIAL SKILLS FOR MICRO-SMALL-MEDIUM ENTERPRISES (MSMES)

UNIT CODE : 400311327

UNIT DESCRIPTOR : This unit covers the outcomes required to build, operate and grow a micro/small-scale enterprise.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Develop and maintain micro-small medium enterprise (MSMEs) skills in the organization	1.1 Appropriate ***business strategies*** are determined and set for the enterprise based on current and emerging business environment. 1.2 ***Business operations*** are monitored and controlled following established procedures. 1.3 Quality assurance measures are implemented consistently. 1.4 Good relations are maintained with staff/workers. 1.5 Policies and procedures on occupational safety and health and environmental concerns are constantly observed.	1.1 Business models and strategies 1.2 Types and categories of businesses 1.3 Business operation 1.4 Basic Bookkeeping 1.5 Business internal controls 1.6 Basic quality control and assurance concepts 1.7 Government and regulatory processes	1.1 Basic bookkeeping/ accounting skills 1.2 Communication skills 1.3 Building relations with customer and employees 1.4 Building competitive advantage of the enterprise

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Establish and maintain client-base/ market	2.1 Good customer relations are maintained 2.2 New customers and markets are identified, explored and reached out to. 2.3 Promotions/ Incentives are offered to loyal customers 2.4 Additional products and services are evaluated and tried where feasible. 2.5 ***Promotional/ advertising initiatives*** are carried out where necessary and feasible.	2.1 Public relations concepts 2.2 Basic product promotion strategies 2.3 Basic market and feasibility studies 2.4 Basic business ethics	2.1 Building customer relations 2.2 Individual marketing skills 2.3 Using basic advertising (posters/ tarpaulins, flyers, social media, etc.)
3. Apply budgeting and financial management skills	3.1 Enterprise is built up and sustained through judicious control of cash flows. 3.2 Profitability of enterprise is ensured through appropriate ***internal controls.*** 3.3 Unnecessary or lower-priority expenses and purchases are avoided.	3.1 Cash flow management 3.1 Basic financial management 3.2 Basic financial accounting 3.3 Business Internal controls	3.1 Setting business priorities and strategies 3.2 Interpreting basic financial statements 3.3 Preparing business plans

RANGE OF VARIABLES

VARIABLE	RANGE
1. Business strategies	May include: 1.1. Developing/Maintaining niche market 1.2. Use of organic/healthy ingredients 1.3. Environment-friendly and sustainable practices

	1.4. Offering both affordable and high-quality products and services 1.5. Promotion and marketing strategies (e. g., online marketing)
2. Business operations	May include: 2.1 Purchasing 2.2 Accounting/Administrative work 2.3 Production/Operations/Sales
3. Internal controls	May include: 3.1 Accounting systems 3.2 Financial statements/reports 3.3 Cash management
4. Promotional/ Advertising initiatives	May include: 4.1 Use of tarpaulins, brochures, and/or flyers 4.2 Sales, discounts and easy payment terms 4.3 Use of social media/Internet 4.4 “Service with a smile” 4.5 Extra attention to regular customers

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Demonstrated basic entrepreneurial skills 1.2 Demonstrated ability to conceptualize and plan a micro/small enterprise 1.3 Demonstrated ability to manage/operate a micro/small-scale business
2. Resource Implications	**The following resources should be provided:** 2.1 Simulated or actual workplace 2.2 Tools, materials and supplies needed to demonstrate the required tasks 2.3 References and manuals
3. Methods of Assessment	**Competency in this unit should be assessed through:** 3.1 Written examination 3.2 Demonstration/observation with oral questioning 3.3 Portfolio assessment with interview 3.4 Case problems
4. Context for Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

COMMON COMPETENCIES

UNIT TITLE : **APPLY QUALITY STANDARDS**

UNIT CODE : **ICT315202**

UNIT DESCRIPTOR : This unit covers the knowledge, skills, attitudes and values needed to apply quality standards in the workplace. The unit also includes the application of relevant safety procedures and regulations, organization procedures and customer requirements.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Assess quality of received materials	1.1. Work instruction is obtained and work is carried out in accordance with standard operating procedures. 1.2. Received ***materials*** are checked against workplace standards and specifications. 1.3. Faulty materials related to work are identified and isolated. 1.4. ***Faults*** and any identified causes are recorded and/or reported to the supervisor concerned in accordance with workplace procedures. 1.5. Faulty materials are replaced in accordance with workplace procedures.	1.1. Relevant production processes, materials and products 1.2. Characteristics of materials, software and hardware used in production processes 1.3. Quality checking procedures 1.4. Quality Workplace procedures 1.5. Identification of faulty materials related to work	1.1. Reading skills required to interpret work instruction 1.2. Critical thinking 1.3. Interpreting work instructions

2. Assess own work	2.1. ***Documentation*** relative to quality within the company is identified and used. 2.2. Completed work is checked against workplace standards relevant to the task undertaken. 2.3. ***Errors*** are identified and isolated. 2.4. Information on the quality and other indicators of production performance are recorded in accordance with workplace procedures. 2.5. In cases of deviations from specific ***quality standards***, causes are documented and reported in accordance with the workplace' s standards operating procedures.	2.1. Safety and environmental aspects of production processes 2.2. Fault identification and reporting 2.3. Workplace procedure in documenting completed work 2.4. Workplace Quality Indicators	2.1. Carry out work in accordance with OHS policies and procedures
3. Engage in quality improvement (Produce)	3.1. Process improvement procedures are participated in relative to workplace assignment. 3.2. Work is carried out in accordance with process improvement procedures. 3.3. Performance of operation or quality of product of service to ensure ***customer*** satisfaction is monitored.	3.1. Quality improvement processes 3.2. Company customers defined	3.1. Solution providing and decision-making 3.2. Practice company process improvement procedure

RANGE OF VARIABLES

VARIABLE	RANGE
1 Materials	Materials may include but not limited to: 1.1. Manuals 1.2. Job order 1.3. Instructional videos
2 Faults	Faults may include but not limited to: 2.1. Materials not to specification 2.2. Materials contain incorrect/outdated information 2.3. Hardware defects 2.4. Materials that do not conform with any regulatory agencies
3 Documentation	3.1 Organization work procedures 3.2 Manufacturer's instruction manual 3.3 Customer requirements 3.4 Forms
4 Errors	Errors may be related but not limited to the following: 4.1. Deviation from the requirements of the client 4.2. Deviation from the requirement of the organization
5 Quality standards	Quality standards may be related but not limited to: 5.1. Materials 5.2. Hardware 5.3. Final product 5.4. Production processes 5.5. Customer service
6 Customer	6.1 Co-worker 6.2 Supplier/Vendor 6.3 Client 6.4 Organization receiving the product or service

EVIDENCE GUIDE

1 Critical aspect of competency	Assessment must show that the candidate: 1.1 Carried out work in accordance with the company's standard operating procedures 1.2 Performed task according to specifications 1.3 Reported defects detected in accordance with standard operating procedures 1.4 Carried out work in accordance with the process improvement procedures
2 Method of assessment	The assessor must select two of the following to objectively evaluate the candidate: 2.1 Demonstration observation with oral questioning 2.2 Practical demonstration 2.3 Interview

3	Resource implication	3.1	Materials, software and hardware to be used in a real or simulated situation
4	Context of Assessment	4.1	Assessment may be conducted in the workplace or in a simulated environment

UNIT TITLE : **PERFORM COMPUTER OPERATIONS**

UNIT CODE : **ELC311203**

UNIT DESCRIPTOR : This unit covers the knowledge, skills, (and) attitudes and values needed to perform computer operations which include inputting, accessing, producing and transferring data using the appropriate hardware and software

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for task to be undertaken	1.1. Requirements of task are determined according to job specifications 1.2. Appropriate ***hardware and peripheral devices*** and ***software*** are selected according to task assigned and required outcome 1.3. Task is planned to ensure ***OH&S guidelines*** and procedures are followed 1.4. Client -specific guidelines and procedures are followed. 1.5. Required data security guidelines are applied in accordance with existing procedures.	1.1. Main types of computers and basic features of different operating systems 1.2. Main parts of a computer 1.3. Information on hardware and software 1.4. Data security guidelines	1.1. Reading and comprehension skills required to interpret work instruction and to interpret basic user manuals. 1.2. Communication skills to identify lines of communication, request advice, follow instructions and receive feedback. 1.3. Interpreting user manuals and security guidelines

2. Input data into computer	2.1. Data are entered into the computer using appropriate program/application in accordance with company procedures 2.2. Accuracy of information is checked and information is saved in accordance with standard operating procedures 2.3. Inputted data are stored in ***storage media*** according to requirements 2.4. Work is performed within ***ergonomic guidelines***	2.1. Basic ergonomics of keyboard and computer user 2.2. Storage devices and basic categories of memory 2.3. Relevant types of software	2.1. Technology skills to use equipment safely including keyboard skills. 2.2. Entering data
3. Access information using computer	3.1. Correct program/application is selected based on job requirements 3.2.Program/application containing the information required is accessed according to company procedures 3.3. ***Desktop icons*** are correctly selected, opened and closed for navigation purposes 3.4. Keyboard techniques are carried out in line with OH&S requirements for safe use of keyboards	3.1. General security, privacy legislation and copyright 3.2. Productivity Application 3.3. Business Application	3.1. Accessing information 3.2. Searching and browsing files and data

4. Produce/ output data using computer system	4.1. Entered data are processed using appropriate software commands 4.2. Data printed out as required using computer hardware/peripheral devices in accordance with standard operating procedures 4.3. Files, data are transferred between compatible systems using computer software, hardware/ peripheral devices in accordance with standard operating procedures	4.1. Computer application in printing, scanning and sending facsimile 4.2. Types and function of computer peripheral devices	4.1. Computer data processing 4.2. Printing of data 4.3. Transferring files and data
5. Maintain computer equipment and systems	5.1. Systems for cleaning, minor ***maintenance*** and replacement of consumables are implemented 5.2. Procedures for ensuring security of data, including regular back-ups and virus checks are implemented in accordance with standard operating procedures 5.3. Basic file maintenance procedures are implemented in line with the standard operating procedures	5.1 Computer equipment/system basic maintenance procedures 5.2 Viruses 5.3 OH&S principles and responsibilities 5.4 Calculating computer capacity 5.5 System Software 5.6 Basic file maintenance procedures	5.1 Removing computer viruses from infected machines 5.2 Making backup files

RANGE OF VARIABLES

VARIABLE	RANGE
1. Hardware and peripheral devices	1.1. Personal computers 1.2. Networked systems 1.3. Communication equipment 1.4. Printers 1.5. Scanners 1.6. Keyboard 1.7. Mouse
2. Software	Software includes the following but not limited to: 2.1. Word processing packages 2.2. Data base packages 2.3. Internet 2.4. Spreadsheets
3. OH&S guidelines	3.1. OHS guidelines 3.2. Enterprise procedures
4. Storage media	Storage media include the following but not limited to: 4.1. CDs/DVDs 4.2. zip disks 4.3. hard disk drives, local and remote 4.4. USB drives 4.5. Cloud-based
5. Ergonomic guidelines	5.1 Types of equipment used 5.2 Appropriate furniture 5.3 Seating posture 5.4 Lifting posture 5.5 Visual display unit screen brightness
6. Desktop icons	Icons include the following but not limited to: 6.1 directories/folders 6.2 files 6.3 network devices 6.4 recycle bin
7. Maintenance	7.1 Creating more space in the hard disk 7.2 Reviewing programs 7.3 Deleting unwanted files 7.4 Backing up files 7.5 Checking hard drive for errors 7.6 Using up to date anti-virus programs 7.7 Cleaning dust from internal and external surfaces

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1. Selected and used hardware components correctly and according to the task requirement 1.2. Identified and explain the functions of both hardware and software used, their general features and capabilities 1.3. Produced accurate and complete data in accordance with the requirements 1.4. Used appropriate devices and procedures to transfer files/data accurately 1.5. Maintained computer system
2. Method of assessment	The assessor may select two of the following assessment methods to objectively assess the candidate: 2.1 Observation 2.2 Questioning 2.3 Practical demonstration
3. Resource implication	3.1. Computer hardware with peripherals 3.2. Appropriate software
4. Context of Assessment	4.1. Assessment may be conducted in the workplace or in a simulated work environment

CORE COMPETENCIES

UNIT TITLE : **CONDUCT PROVISIONING OF CLOUD INFRASTRUCTURE RESOURCES**

UNIT CODE : **AB-ICT1381200133301**

UNIT DESCRIPTOR : This unit covers the skills and knowledge required to conduct provisioning of cloud infrastructure resources effectively. It includes deploying virtual machines, storage solutions, and network configurations in a cloud environment.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify the requirement for cloud infrastructure resources	1.1. ***Cloud service providers*** are identified according to the organization's requirements. 1.2. ***Cloud infrastructure components*** are identified and listed according to the organization's requirements. 1.3. Confirm the identified resource needs with ***stakeholders*** to ensure accuracy and alignment with business objectives.	1.1. Knowledge of cloud computing technologies and infrastructure components (e.g., virtual machines, storage, networking). 1.2. Understanding of mathematics for calculating cloud resource requirements and costs. 1.3. Communication techniques to collaborate with stakeholders and ensure business objectives are met. 1.4. Awareness of environmental impact related to cloud data centers and energy consumption. 1.5. Understanding of security protocols for cloud resource provisioning and compliance with industry standards.	1.1. Needs Assessment Skills 1.2. Cloud Resource Deployment Skills 1.3. Resource Utilization Skills 1.4. Monitoring Skills 1.5. Communication Skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Configure cloud infrastructure resources.	3.1. ***Virtual machines*** are deployed according to the ***provisioning plan*** and ***organizational policies***. 3.2 ***Storage solutions*** are arranged according to performance and capacity requirements. 3.3 Cloud ***network infrastructure*** are structured according to the provisioning plan and organizational policies. 3.4 ***Provisioning scripts and automation tools*** are utilized according to the organization's deployment process.	2.1. Knowledge of cloud infrastructure technologies, including virtual machines, storage, and networking configurations. 2.2. Understanding of mathematics for optimizing storage capacity and performance metrics. 2.3. Knowledge of scripting languages and automation tools (e.g., Terraform, Ansible) for cloud provisioning. 2.4. Understanding of network technologies, including subnets, firewalls, and VPNs, and their environmental impacts. 2.5. Familiarity with environmental best practices in data center energy efficiency and sustainability.	2.1. Analytical Skills 2.2. Automation Skills 2.3. Network Configuration Skills 2.4. Scripting Skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Test provisioned cloud infrastructure.	3.1. Cloud infrastructure components ***configuration inspection*** is conducted following the provisioning plan and organizational policies. 3.2. ***Functionality verification*** of the cloud infrastructure components is performed according to the organization's requirements. 3.3. Validated results are documented following the organizational policies.	3.1. Knowledge of testing methodologies and troubleshooting techniques for cloud infrastructure components. 3.2. Understanding of monitoring tools and dashboards to evaluate performance and detect issues. 3.3. Communication and documentation techniques for accurately reporting test results and system status. 3.4. Familiarity with math-based analysis for performance metrics and optimization strategies. 3.5. Awareness of environmental considerations related to cloud infrastructure maintenance and energy usage.	3.1. Testing Skills 3.2. Troubleshooting Skills 3.3. Documentation Skills
4. Document provisioned cloud infrastructure	4.1. ***Cloud resource documentation*** is produced including configurations, ***access controls***, and ***security settings***. 4.2. Documentation is aligned with organizational policies.	4.1. Knowledge of cloud documentation best practices, including version control and security considerations. 4.2. Understanding of communication techniques for creating clear and	4.1. Documentation Management Skills 4.2. Version Control Skills 4.3. Attention to Detail

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		comprehensive technical documentation. 4.3. Familiarity with compliance standards for data security and privacy in cloud environments. 4.4. Awareness of environmental policies related to cloud infrastructure management, focusing on sustainable practices. 4.5. Understanding of version control tools for managing changes and updates to documentation..	

RANGE OF VARIABLES

VARIABLE	RANGE
1. Cloud Service Providers	It may include but is not limited to: - AWS - Azure - Google Cloud - IBM Cloud - Oracle Cloud
2. Cloud Infrastructure Components	It may include but is not limited to: - Storage Solutions - Network Configurations - Load Balancers - Firewalls - Virtual Machines (VMs) - Containers - Storage Solutions - Databases - Networking Solutions - Security Components - Management and Monitoring Tools - Serverless Computing Services
3. Stakeholders	It may include but is not limited to: - Project Managers - IT Department - Business Analysts - End Users - External Vendors
4. Virtual Machines	It may include but is not limited to: - Linux-based VMs - Windows-based VMs - Containerized VMs (e.g., Docker) - Bare Metal VMs
5. Provisioning Plan	It may include but is not limited to: - Resource Allocation Requirements - Scalability Plan - Security Policies - Cost Management Guidelines
6. Organizational Policies	It may include but is not limited to: - Data Protection Policies - Resource Usage Guidelines - Security Compliance Requirements - Regulatory Standards
7. Storage Solutions	It may include but is not limited to: - Cloud-based Storage (e.g., S3, Azure Blob Storage)

	- Block Storage - Object Storage - File Storage Systems
8. Network Infrastructure	It may include but is not limited to: - Subnets - Virtual Private Networks (VPNs) - Virtual Firewalls - Network Load Balancers
9. Provisioning Scripts and Automation Tools	It may include but is not limited to: - Terraform - Ansible - CloudFormation - Chef - Puppet
10. Configuration Inspection	It may include but is not limited to: - Resource Allocation - Security Settings - Performance Metrics - Backup Configuration
11. Functionality Verification	It may include but is not limited to: - Performance Testing - Load Testing - System Uptime - Resource Availability
12. Cloud Resource Documentation	It may include but is not limited to: - Resource Inventory - Access Controls - Security Configurations - Network Settings
13. Access Controls	It may include but is not limited to: - Identity and Access Management (IAM) - Role-Based Access Control (RBAC) - Multi-Factor Authentication (MFA)
14. Security Settings	It may include but is not limited to: - Encryption Protocols - Firewall Rules - VPN Configurations - Network Security Policies

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Identified cloud service providers and infrastructure components according to organizational requirements. 1.2. Confirmed resource needs with stakeholders to ensure accuracy and alignment with business objectives. 1.3. Configured cloud infrastructure components (e.g., virtual machines, storage, networking) according to the provisioning plan and organizational policies. 1.4. Deployed virtual machines, storage, and network configurations following the organization's performance and capacity requirements. 1.5. Tested the cloud infrastructure to verify functionality, troubleshoot issues, and ensure alignment with organizational policies. 1.6. Documented the provisioned cloud resources, including configurations, access controls, and security settings, in line with organizational standards. 1.7. Maintained up-to-date cloud infrastructure documentation and ensured compliance with industry standards for security and sustainability.
2. Resource Implications	The following resources should be provided: 2.1. Access to cloud service providers (e.g., AWS, Azure, Google Cloud) and infrastructure components. 2.2. Access to organizational policies, provisioning plans, and capacity requirements for cloud resources. 2.3. Scripting and automation tools for cloud infrastructure provisioning (e.g., Terraform, Ansible). 2.4. Testing and troubleshooting tools for cloud infrastructure verification. 2.5. Access to monitoring tools and dashboards for performance evaluation. 2.6. Documentation templates and version control tools for recording cloud resource configurations and updates.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1. Direct observation. 3.2. Review of documentation 3.3. Practical demonstrations 3.4. Questioning 3.5. Simulated tasks
4. Context for Assessment	Competency may be assessed in the workplace or in a simulated workplace environment. 4.1. Assessment should be conducted in an environment where the candidate can access real or simulated cloud infrastructure and tools. 4.2. The candidate should be provided with necessary resources and support to demonstrate their skills in cloud infrastructure provisioning, testing, and documentation.

	4.3. Simulated environments may be used to replicate common cloud provisioning and testing tasks for assessment purposes.

UNIT TITLE : **MANAGE ACCESS PERMISSIONS IN THE CLOUD ENVIRONMENT**

UNIT CODE : **AB-ICT1381200133302**

UNIT DESCRIPTOR : This unit focuses on managing access permissions within a cloud environment. It involves granting and revoking user and group permissions to ensure secure and controlled access to cloud resources.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify the requirement for access permissions.	1.1. ***Access permission requests*** are reviewed according to organizational policies and ***access control*** requirements. 1.2. ***User roles*** are defined according to ***access levels.*** 1.3. Identified access needs are confirmed with ***stakeholders*** to ensure accuracy. 1.4. Access permissions are validated to comply with security protocols.	1.1. Understanding of identity and access management (IAM) principles. 1.2. Knowledge of security best practices for access controls. 1.3. Awareness of compliance and regulatory requirements (e.g., GDPR, HIPAA). 1.4. Understanding of role-based access control (RBAC) models and segregation of duties. 1.5. Familiarity with communication protocols for access management systems.	1.1. Ability to define and document access permissions. 1.2. Attention to detail and security awareness. 1.3. Effective communication skills to collaborate with stakeholders and document processes. 1.4. Ability to interpret regulatory requirements for access controls.
2. Configure access permissions and controls.	2.1. Access permissions are set up using ***Identity and Access Management (IAM)*** tools according to the plan. 2.2. Access controls are applied based on user roles and	2.1. Familiarity with IAM tools and technologies (e.g., AWS IAM, Azure AD). 2.2. Understanding of Multi-Factor Authentication (MFA) and Role-Based Access	2.1. Skills in implementing access controls (e.g., MFA, RBAC). 2.2. Proficiency in configuring and managing IAM tools. 2.3. Analytical skills for assessing

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	organizational policies. 2.3. Multi-Factor Authentication (MFA) and Role-Based Access Control (RBAC) are implemented according to security best practices. 2.4. ***Access settings*** are aligned with compliance requirements and organizational security policies.	Control (RBAC) principles. 2.3. Knowledge of cryptographic methods for securing user access. 2.4. Awareness of environmental impacts of data center security infrastructure (e.g., energy consumption, sustainable practices). 2.5. Knowledge of communication protocols for access management tools and APIs.	security risks related to access permissions. 2.4. Technical proficiency in integrating access controls with cloud environments.
3. Test access activities and revocations.	3.1. Access permissions configuration is inspected following the access control requirement. 3.2. Access controls are adjusted based on user roles and organizational policies. 3.3. Access permissions and controls are verified to ensure proper ***functionality***. 3.4. ***Revoked access*** permissions are confirmed to prevent unauthorized access.	3.1. Knowledge of monitoring tools for auditing access logs and activities. 3.2. Understanding of access revocation best practices and security implications. 3.3. Familiarity with mathematical concepts for analyzing access patterns and detecting anomalies. 3.4. Communication skills for reporting on access activities and generating audit reports.	3.1. Competence in monitoring and auditing access logs. 3.2. Troubleshooting skills for identifying and resolving access issues. 3.3. Documentation skills for access control audits. 3.4. Risk management skills for identifying potential security vulnerabilities.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		3.5. Awareness of environmental impacts of access management infrastructure (e.g., power usage for security systems).	
4. Document access permission updates	4.1. Access permissions are reviewed for compliance and appropriateness. 4.2. ***Configuration processes*** and settings are recorded in accordance with organizational policies and standards. 4.3. ***Access control documentation*** is updated and maintained regularly to reflect changes in user roles and permissions. 4.4. Documentation is shared with relevant stakeholders for review and approval.	4.1. Understanding of best practices for documenting access control configurations. 4.2. Knowledge of compliance standards for access documentation (e.g., ISO/IEC 27001). 4.3. Awareness of communication protocols for distributing access control documentation. 4.4. Knowledge of environmental policies for reducing paper-based documentation and promoting digital record-keeping. 4.5. Familiarity with version control tools for managing documentation changes.	4.1. Documentation management skills. 4.2. Version control skills for tracking changes to access permissions. 4.3. Attention to detail for accurate record-keeping. 4.4. Communication skills for sharing documentation with stakeholders.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Access Permission Requests	It may include but is not limited to: - Requests for new users - Role-based access requests - Temporary access requests - Access modification requests
2. Access Control	It may include but is not limited to: - User roles and permissions - Security clearance levels - Access duration limits - Multi-Factor Authentication (MFA) - Access Control Lists (ACLs) - Identity-Based Access Control - Role-Based Access Control (RBAC) - Rule-Based Access Control - Attribute-Based Access Control (ABAC) - Context-Based Access Control - Time-Based Access Control - Location-Based Access Control - Task-Based Access Control - History-Based Access Control - Usage-Based Access Control - Policy-Based Access Control - Logical Access Control - Discretionary Access Control (DAC) - Mandatory Access Control (MAC)
3. User Roles	It may include but is not limited to: - Admin - Standard User - Guest - IT Support - Managerial Roles
4. Access Levels	It may include but is not limited to: - Full access - Read-only access - Restricted access - Administrator-level access
5. Stakeholders	It may include but is not limited to: - Department Heads - IT Security Teams - HR - External Auditors - Compliance Officers
6. Identity and Access	It may include but is not limited to: - AWS Identity and Access Management (IAM)

Management (IAM) Tools	- Microsoft Azure Active Directory (Azure AD) - Google Cloud Identity and Access Management (IAM) - Okta Identity Cloud - IBM Security Identity Governance and Intelligence - SailPoint IdentityIQ - Ping Identity - OneLogin Unified Access Management - Oracle Identity Management - CyberArk Privileged Access Security - ForgeRock Identity Platform - RSA SecurID Suite - Auth0 - Centrify Identity Service - NetIQ Identity Manager
7. Access Settings	It may include but is not limited to: - User access permissions - Security group configurations - Access control lists (ACLs) - MFA settings
8. Functionality	It may include but is not limited to: - Access permissions verified - User access logs - Test user access - Reporting on access failures
9. Revoked Access	It may include but is not limited to: - Terminated employees - Expired access - Contractor account deactivation - Access timeout settings
10. Configuration Processes	It may include but is not limited to: - Step-by-step access setup - Validation and testing - Documentation of configurations - Logging of changes
11. Access Control Documentation	It may include but is not limited to: - User access logs - Access policies - Permission change records - Configuration history

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Reviewed and evaluated access permission requests according to organizational policies and access control requirements. 1.2. Defined user roles based on access levels and security protocols. 1.3. Confirmed access needs with stakeholders to ensure accuracy and alignment with organizational requirements. 1.4. Set up and implemented access controls using Identity and Access Management (IAM) tools in line with organizational policies. 1.5. Applied Multi-Factor Authentication (MFA) and Role-Based Access Control (RBAC) based on security standards. 1.6. Tested access controls and verified that access permissions were appropriately configured, revoked, or updated according to organizational policies. 1.7. Documented and regularly updated access permissions to ensure compliance with security protocols and regulatory requirements. 1.8. Conducted regular audits and reviews of access permissions for compliance and accuracy.
2. Resource Implications	The following resources should be provided: 2.1. Access to Identity and Access Management (IAM) tools (e.g., AWS IAM, Azure AD). 2.2. Access control and audit tools for monitoring and logging access activities. 2.3. Organizational policies, standards, and security guidelines for access control management. 2.4. Documentation templates for access control updates, user role assignments, and audits. 2.5. Support from stakeholders for confirming access needs and validating permissions. 2.6. Version control systems for managing changes to access documentation.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1. Direct observation 3.2. Review of documentation 3.3. Practical demonstrations 3.4. Questioning 3.5. Simulated tasks
4. Context for Assessment	Competency may be assessed in the workplace or in a simulated workplace environment. 4.1. Assessment should be conducted in an environment where the candidate can access real or simulated Identity and Access Management (IAM) systems.

	4.2. The candidate should be provided with necessary resources and support to demonstrate skills in access management and documentation. 4.3. Simulated environments may be used to replicate access management and revocation tasks for assessment purposes.

UNIT TITLE : **CONFIGURE CLOUD RESOURCES MONITORING SERVICES**

UNIT CODE : **AB-ICT1381200133303**

UNIT DESCRIPTOR : This unit involves setting up and maintaining cloud resource monitoring services to ensure optimal performance and availability. It includes configuring monitoring tools and dashboards, setting up alerts, and analyzing performance metrics.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Define the requirement for cloud infrastructure resource monitoring.	1.1. Organizational needs are assessed in accordance with ***organizational monitoring protocols*** for cloud resources. 1.2. ***Performance metrics*** and ***availability standards*** are analyzed according to monitoring guidelines. 1.3. Overall requirements for cloud resource monitoring are documented following organizational policies. 1.4. ***Key metrics*** and resources are identified based on organizational cloud infrastructure standards. 1.5. ***Monitoring tools and services*** are researched and selected based on organizational needs and compliance standards.	1.1. Understanding of cloud resource monitoring principles and metrics. 1.2. Knowledge of various monitoring tools and technologies (e.g., AWS CloudWatch, Azure Monitor). 1.3. Familiarity with configuring dashboards and alerts for real-time monitoring. 1.4. Awareness of best practices for performance analysis and uptime monitoring. 1.5. Understanding of compliance and security considerations related to monitoring data. 1.6. Mathematical knowledge to analyze cloud performance metrics. 1.7. Awareness of environmental	1.1. Ability to set up and configure monitoring tools. 1.2. Proficiency in creating and customizing monitoring dashboards. 1.3. Skills in defining and configuring alerts and notifications. 1.4. Competence in analyzing monitoring data and generating reports. 1.5. Strong attention to detail and analytical skills. 1.6. Effective communication skills to collaborate with stakeholders and document processes.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	1.6. Identified monitoring tools and services are confirmed with stakeholders to meet organizational accuracy and suitability standards.	impacts related to cloud data center performance (e.g., energy consumption). 1.8. Communication strategies for engaging with stakeholders. 1.9. Understanding of capacity planning and resource allocation.	
2. Configure monitoring tools and dashboards.	2.1. Monitoring tools are set up according to the ***implementation plan*** and organizational policies. 2.2. ***Dashboards*** are configured to display key metrics and performance indicators in line with organizational standards. 2.3. ***Alerts and notifications*** for critical events and thresholds are set up according to operational requirements. 2.4. The ***configuration process*** and settings are documented according to organizational standards.	2.1. Knowledge of monitoring tools and dashboard configuration techniques. 2.2. Understanding of key cloud metrics such as CPU usage, memory consumption, network traffic, and disk performance. 2.3. Awareness of automation techniques for setting up alerts and notifications. 2.4. Familiarity with communication protocols for integrating monitoring tools with alerting systems. 2.5. Awareness of environmental considerations for monitoring data centers, focusing on energy efficiency.	2.1. Dashboard configuration skills. 2.2. Proficiency in setting up automated alerts. 2.3. Skills in monitoring tool integration with cloud platforms. 2.4. Technical documentation skills for recording configuration settings. 2.5. Communication skills to present monitoring data to stakeholders.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		2.6. Knowledge of security protocols for monitoring cloud resources. 2.7. Understanding of data visualization best practices for presenting monitoring data.	
3. Validate configured monitoring tools and dashboards	3.1. Monitoring tools are tested in compliance with organizational standards to ensure they capture accurate and relevant data. 3.2. Dashboards are verified to display the correct metrics and are accessible to relevant stakeholders according to organizational guidelines. 3.3. Alerts and notifications are tested to ensure they are triggered appropriately and delivered to the right recipients as per organizational policies. 3.4. ***Monitoring data*** is reviewed in line with organizational standards to identify ***trends and anomalies.*** 3.5. Validation results are documented, and necessary adjustments are made to optimize	3.1. Knowledge of validation techniques for monitoring tools and dashboards. 3.2. Familiarity with audit trails and logging for monitoring activities. 3.3. Understanding of troubleshooting techniques for monitoring tools and alert configurations. 3.4. Mathematical skills for trend analysis and performance forecasting. 3.5. Awareness of environmental considerations when analyzing resource utilization and energy consumption. 3.6. Communication skills for reporting validation results and issues.	3.1. Validation skills for testing monitoring tools. 3.2. Troubleshooting skills for identifying and resolving monitoring issues. 3.3. Competence in analyzing and interpreting monitoring data. 3.4. Documentation skills for recording validation results. 3.5. Communication skills for conveying validation outcomes to stakeholders.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	monitoring services according to organizational protocols.		
4. Document configured cloud resources monitoring services	4.1. The monitoring configuration process is documented in accordance with organizational policies and standards. 4.2. Updates to monitoring services and configurations are recorded regularly in line with organizational documentation protocols. 4.3. Documentation is reviewed to ensure compliance with security and operational requirements. 4.4. Documentation is shared with relevant stakeholders for review and approval according to organizational communication guidelines. 4.5. Documentation is maintained to ensure up-to-date records of all monitoring services in compliance with organizational standards.	4.1. Knowledge of best practices for documenting cloud monitoring configurations. 4.2. Awareness of compliance standards for documentation related to cloud monitoring services. 4.3. Understanding of version control tools for managing documentation updates. 4.4. Familiarity with communication protocols for distributing monitoring documentation. 4.5. Awareness of sustainability practices in digital record-keeping and reducing paper-based documentation.	4.1. Documentation management skills. 4.2. Attention to detail in recording monitoring configuration processes. 4.3. Version control skills for managing updates to monitoring documentation. 4.4. Communication skills for sharing documentation with stakeholders. 4.5. Compliance review skills for ensuring documentation meets organizational policies.

RANGE OF VARIABLES

Variable	Range
1. Organizational Monitoring Protocols	It may include but is not limited to: - Security Monitoring Policies - Data Usage Guidelines - Resource Allocation and Monitoring Guidelines
2. Performance Metrics	It may include but is not limited to: - CPU Usage - Memory Consumption - Network Traffic - Disk Read/Write Speeds - Uptime Metrics
3. Availability Standards	It may include but is not limited to: - Service-Level Agreements (SLAs) - High Availability (HA) Requirements - Disaster Recovery Standards
4. Key Metrics	It may include but is not limited to: - Latency - Throughput - Resource Utilization - Downtime - Bandwidth Usage
5. Monitoring Tools and Services	It may include but is not limited to: - AWS CloudWatch - Azure Monitor - Google Stackdriver - Datadog - New Relic
6. Implementation Plan	It may include but is not limited to: - Cloud Resource Provisioning - Performance Monitoring Strategy - Monitoring Tool Configuration Guidelines
7. Dashboards	It may include but is not limited to: - Real-time Performance Dashboards - Customizable Metric Views - Visualization of Resource Usage Trends
8. Alerts and Notifications	It may include but is not limited to: - Email Alerts - SMS Notifications

	- Integration with Incident Management Tools (e.g., PagerDuty) - Webhooks
9. Configuration Process	It may include but is not limited to: - Setting up Monitoring Tools - Integrating Tools with Cloud Resources - Configuring Dashboards and Alerts
10. Monitoring Data	It may include but is not limited to: - Real-time System Metrics - Historical Performance Logs - Audit Trails - System Event Logs
11. Trends and Anomalies	It may include but is not limited to: - Performance Degradation - Unexpected Resource Spikes - Network Latency Issues - Data Traffic Bottlenecks

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Assessed organizational needs for cloud infrastructure resource monitoring in accordance with monitoring protocols. 1.2. Analyzed performance metrics and availability standards based on organizational guidelines. 1.3. Documented overall requirements for cloud resource monitoring in line with organizational policies. 1.4. Researched and selected appropriate monitoring tools and services in compliance with organizational standards. 1.5. Configured and implemented monitoring tools, dashboards, alerts, and notifications in accordance with organizational protocols. 1.6. Tested, validated, and documented monitoring tools and dashboards to ensure compliance with organizational requirements. 1.7. Regularly reviewed and updated monitoring documentation, ensuring compliance with security and operational requirements.

	1.8. Shared monitoring documentation with stakeholders and ensured appropriate communication throughout the process.
2. Resource Implications	The following resources should be provided: 2.1. Access to cloud infrastructure and monitoring tools (e.g., AWS CloudWatch, Azure Monitor). 2.2. Diagnostic and configuration tools for setting up dashboards and alerts. 2.3. Access to organizational policies and standards for monitoring cloud resources. 2.4. Stakeholder feedback and support for monitoring requirements and validation. 2.5. Documentation templates for recording monitoring configuration and updates. 2.6. Access to version control tools for managing and updating monitoring documentation.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1. Direct observation 3.2. Review of documentation 3.3. Practical demonstration 3.4. Questioning 3.5. Simulated tasks
4. Context for Assessment	Competency may be assessed in the workplace or in a simulated workplace environment 4.1. Assessment should be conducted in an environment where the candidate can access real or simulated cloud infrastructure. 4.2. The candidate should be provided with the necessary resources and support to demonstrate cloud monitoring skills in line with organizational standards. 4.3. Simulated environments may be used to replicate cloud monitoring activities for testing and validation purposes.

UNIT TITLE : **IMPLEMENT BACKUP AND RECOVERY PLANS**

UNIT CODE : **AB-ICT1381200133304**

UNIT DESCRIPTOR : This unit covers the development and execution of effective backup and recovery strategies to safeguard cloud data. It includes designing backup schedules, performing regular backups, and testing recovery procedures.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify the requirement for backup and recovery.	1.1. Required information is identified in accordance with ***organizational data protection policies.*** 1.2. ***Sources of required information*** are accessed in compliance with organizational standards. 1.3. Overall requirements for backup and recovery are documented following organizational policies. 1.4. ***Data criticality*** *and* ***retention requirements*** are analyzed according to data management standards. 1.5. Current ***data storage and backup infrastructure*** is evaluated to ensure compliance with organizational recovery policies.	1.1. Understanding of data backup and recovery principles. 1.2. Knowledge of backup tools and technologies (e.g., Veeam, AWS Backup, Azure Backup). 1.3. Familiarity with disaster recovery planning and data retention policies. 1.4. Awareness of regulations and compliance standards related to data protection (e.g., GDPR, HIPAA). 1.5. Knowledge of data storage infrastructure and types of storage media. 1.6. Awareness of the environmental impact of data centers and energy consumption in backup storage. 1.7. Understanding of how to perform risk assessments for data loss and recovery.	1.1. Ability to design and document backup schedules. 1.2. Proficiency in performing and verifying backups. 1.3. Skills in configuring and testing backup systems. 1.4. Competence in validating backup integrity and recovery processes. 1.5. Strong organizational and planning skills. 1.6. Effective communication skills to collaborate with stakeholders and document processes.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Implement backup schedules and procedures.	2.1. ***Backup and recovery solutions*** are selected based on organizational needs and compliance standards. 2.2. ***Backup configurations*** and ***backup schedules*** and processes are implemented in accordance with organizational policies. 2.3. Backup and recovery solutions are prepared to align with current data storage and infrastructure policies. 2.4. The identified backup and recovery solutions are confirmed with ***stakeholders*** to meet organizational accuracy and suitability standards. 2.5. Backup schedules are followed, and the backup process is regularly monitored as per organizational standards.	2.1. Knowledge of various backup solutions, including cloud-based and on-premise systems. 2.2. Familiarity with configuring automated backup solutions. 2.3. Understanding of data encryption techniques for securing backups. 2.4. Knowledge of storage media types and their environmental impact (e.g., tape vs. disk storage). 2.5. Awareness of industry best practices for ensuring backup compliance and data integrity. 2.6. Understanding of network configurations and bandwidth considerations for remote backups. 2.7. Knowledge of version control for managing backup documentation.	2.1. Proficiency in selecting and implementing appropriate backup solutions. 2.2. Technical skills in configuring backup software and hardware. 2.3. Competence in scheduling and managing regular backups. 2.4. Communication skills to confirm solutions with stakeholders. 2.5. Documentation skills for recording backup configurations and procedures.
3. Test backup integrity and recovery processes.	3.1. Regular backups are performed in compliance with the established schedule and organizational policies.	3.1. Knowledge of testing methodologies for backup integrity and recovery. 3.2. Understanding of how to perform recovery	3.1. Skills in testing and validating backup systems. 3.2. Skills in configuring and monitoring backup software.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	3.2. ***Backup systems*** and software are configured to meet organizational compliance standards. 3.3. ***Recovery processes*** are tested to ensure data restoration complies with organizational data recovery policies. 3.4. ***Backup integrity*** is validated through ***recovery simulations*** in accordance with organizational standards. 3.5. The backup implementation process and configurations are documented following organizational protocols.	simulations and data restore processes. 3.3. Awareness of best practices for validating data integrity in backups. 3.4. Familiarity with monitoring and auditing tools for tracking backup success and failure. 3.5. Awareness of environmental and resource optimization practices in managing data center backup systems.	3.3. Ability to simulate recovery processes for testing purposes. 3.4. Attention to detail for ensuring backup integrity. 3.5. Documentation skills for recording backup testing and recovery results.

RANGE OF VARIABLES

Variable	Range
1. Organizational Data Protection Policies	It may include but is not limited to: - Data Retention Policies - Data Privacy Standards - Compliance with Regulatory Requirements (e.g., GDPR, HIPAA)
2. Sources of Required Information	It may include but is not limited to: - Organizational Databases - File Servers - Cloud Storage Services

	- Backup Logs
3. Data Criticality	It may include but is not limited to: - Business-Critical Data - Sensitive or Confidential Data - Transactional Data - Archival Data
4. Retention Requirements	It may include but is not limited to: - Regulatory Retention Periods - Business Data Retention Policies - Data Archiving Standards
5. Data Storage and Backup Infrastructure	It may include but is not limited to: - Cloud-Based Storage - On-Premise Servers - Hybrid Storage Solutions - Network-Attached Storage (NAS)
6. Backup and Recovery Solutions	It may include but is not limited to: - Full Backups - Incremental Backups - Differential Backups - Cloud Backup Solutions - On-Premise Backup Systems
7. Backup Configurations	It may include but is not limited to: - Backup Frequency Settings - Retention Period Configurations - Encryption Settings - Compression Configurations
8. Backup Schedules	It may include but is not limited to: - Daily Backups - Weekly Backups - Monthly Backups - Real-time Backups
9. Stakeholders	It may include but is not limited to: - IT Managers - System Administrators - Compliance Officers - Business Continuity Teams
10. Backup Systems	It may include but is not limited to: - Backup Software (e.g., Veeam, Acronis) - Backup Appliances - Cloud-Based Backup Solutions
11. Recovery Processes	It may include but is not limited to: - Full System Restores - File-Level Restores

	- Point-in-Time Recovery - Virtual Machine Recovery
12. Backup Integrity	It may include but is not limited to: - Validation of Backup Data - Successful Recovery Testing - Error-Free Backup Logs
13. Recovery Simulations	It may include but is not limited to: - Testing of Backup Data Restore - Disaster Recovery Drills - Failover Testing

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Identified required information for backup and recovery in accordance with organizational data protection policies. 1.2. Accessed relevant sources to produce required information in compliance with organizational standards. 1.3. Documented the overall requirements for backup and recovery following organizational policies. 1.4. Analyzed data criticality and retention requirements according to data management standards. 1.5. Evaluated current data storage and backup infrastructure to ensure compliance with organizational recovery policies. 1.6. Selected and implemented backup and recovery solutions based on organizational needs and compliance standards. 1.7. Followed backup schedules and monitored the backup process as per organizational standards. 1.8. Tested recovery processes and validated backup integrity through recovery simulations in accordance with organizational standards. 1.9. Documented the backup implementation process and configurations according to organizational protocols.
2. Resource Implications	The following resources should be provided: 2.1. Access to backup infrastructure and monitoring tools (e.g., Veeam, AWS Backup, Azure Backup). 2.2. Access to data storage infrastructure (e.g., cloud-based, on-premise systems). 2.3. Access to organizational data protection policies and compliance standards (e.g., GDPR, HIPAA). 2.4. Diagnostic and testing tools for validating backup integrity and recovery processes. 2.5. Support from stakeholders and team members to confirm backup and recovery solutions.

	2.6. Documentation templates for recording backup schedules, configurations, and processes.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1. Direct observation 3.2. Review of documentation 3.3. Practical demonstrations 3.4. Questioning 3.5. Simulated tasks
4. Context for Assessment	Competency may be assessed in the workplace or in a simulated workplace environment. 4.1. Assessment should be conducted in an environment where the candidate can access real or simulated backup and recovery infrastructure. 4.2. The candidate should be provided with necessary resources and support to demonstrate their ability to manage backup schedules and validate recovery processes. 4.3. Simulated environments may be used to replicate data loss and recovery scenarios for assessment purposes.

UNIT TITLE : **TROUBLESHOOT CLOUD INFRASTRUCTURE ISSUES**

UNIT CODE : **AB-ICT1381200133305**

UNIT DESCRIPTOR : This unit provides the skills and knowledge to effectively respond to and troubleshoot cloud-related issues. It includes diagnosing problems, implementing solutions, and ensuring minimal downtime.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Diagnose cloud infrastructure issues.	1.1. ***Cloud infrastructure issues and concerns*** are assessed in accordance with organizational protocols. 1.2. Common cloud-related problems are analyzed based on ***operational standards.*** 1.3. Documentation of cloud infrastructure issues is completed in accordance with organizational standards. 1.4. Cloud performance metrics and logs are reviewed in line with ***monitoring and reporting standards.***	1.1. Understanding of cloud infrastructure components and common issues (e.g., latency, connectivity, and resource allocation problems). 1.2. Knowledge of diagnostic tools and techniques (e.g., CloudWatch, Azure Monitor, New Relic). 1.3. Familiarity with cloud service provider support resources for troubleshooting. 1.4. Awareness of best practices for issue resolution and incident management. 1.5. Understanding of performance monitoring and alerting systems. 1.6. Awareness of environmental impacts and energy consumption in cloud	1.1. Ability to define and prioritize cloud infrastructure issues. 1.2. Effective communication skills to collaborate with stakeholders and document processes. 1.3. Skills in using diagnostic tools effectively. 1.4. Strong problem-solving and analytical skills. 1.5. Competence in monitoring and assessing infrastructure performance metrics.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		infrastructure maintenance. 1.7. Knowledge of cloud architecture and design principles. 1.8. Understanding of network protocols and configurations that could impact cloud services. 1.9. Familiarity with backup and disaster recovery plans in cloud environments.	
2. Apply fixes on cloud infrastructure issues and concerns.	2.1. Cloud infrastructure is monitored according to organizational protocols to detect ***anomalies and alerts.*** 2.2. Reports of cloud infrastructure issues from users are logged and categorized according to ***reporting standards.*** 2.3. Issues are prioritized based on ***severity, impact, and urgency*** in line with organizational guidelines. 2.4. Identified issues are confirmed with stakeholders to ensure accuracy and adherence to organizational standards.	2.1. Knowledge of monitoring and alerting tools for cloud environments. 2.2. Familiarity with logging and categorizing issues for future analysis. 2.3. Understanding of prioritization methods based on issue severity and operational impact. 2.4. Awareness of troubleshooting techniques for various cloud issues (e.g., resource limitations, networking issues). 2.5. Understanding of performance tuning for cloud services.	2.1. Competence in documenting troubleshooting processes. 2.2. Proficiency in diagnosing and resolving cloud infrastructure issues. 2.3. Ability to categorize and prioritize issues. 2.4. Communication skills to confirm issue diagnosis and resolution with stakeholders. 2.5. Skills in configuring and managing cloud monitoring systems.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.5. ***Troubleshooting procedures*** are taken in compliance with organizational procedures.	2.6. Knowledge of load balancing, autoscaling, and failover mechanisms in cloud environments. 2.7. Familiarity with communication protocols for alerting teams and stakeholders of issues.	
3. Test resolved cloud infrastructure issues.	3.1. ***Diagnostic tools and techniques*** are used to verify the root cause of cloud infrastructure issues according to troubleshooting protocols. 3.2. Appropriate solutions are implemented in compliance with ***best practices*** and organizational policies. 3.3. Solutions are tested to verify compliance with operational standards and ensure cloud services are fully functional. 3.4. Steps taken to troubleshoot and resolve issues are documented in accordance with organizational documentation protocols.	3.1. Knowledge of diagnostic tools and root cause analysis techniques. 3.2. Understanding of best practices for testing and validating issue resolution in cloud environments. 3.3. Familiarity with incident resolution documentation. 3.4. Awareness of automation tools for resolving repetitive cloud infrastructure issues. 3.5. Knowledge of performance testing tools to ensure stability after issue resolution. 3.6. Awareness of environmental considerations when addressing cloud	3.1. Competence in diagnosing and resolving root causes of cloud infrastructure issues. 3.2. Skills in testing and validating solutions. 3.3. Documentation skills for recording issue resolution processes. 3.4. Communication skills for reporting issue resolution outcomes. 3.5. Problem-solving skills to ensure sustainable solutions.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		infrastructure issues (e.g., resource allocation, energy efficiency).	
4. Document troubleshooting processes.	4.1. Resolved issues are verified through ***post-resolution testing*** according to organizational functionality standards. 4.2. Stability and reliability of cloud services are checked in line with organizational **service-level *agreements (SLAs).*** 4.3. The complete troubleshooting process is documented, including issue identification, diagnosis, resolution, and validation, in accordance with organizational documentation standards. 4.4. Troubleshooting documentation is reviewed and updated in compliance with organizational ***review schedules.*** 4.5. Documentation is shared with relevant stakeholders according to organizational	4.1. Understanding of documentation standards for troubleshooting processes. 4.2. Knowledge of post-resolution testing methods. 4.3. Familiarity with version control tools for managing and updating troubleshooting documentation. 4.4. Awareness of compliance and security protocols related to documentation. 4.5. Knowledge of cloud service management practices to ensure service reliability and continuous improvement. 4.6. Awareness of sustainability practices for maintaining minimal resource usage during troubleshooting processes.	4.1. Competence in documenting the troubleshooting process. 4.2. Attention to detail in recording issue identification, diagnosis, and resolution. 4.3. Skills in post-resolution testing to verify issue fixes. 4.4. Ability to review and update troubleshooting documentation regularly. 4.5. Communication skills for sharing documentation with stakeholders.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	communication protocols.		

RANGE OF VARIABLES

VARIABLE	RANGE
1. Cloud Infrastructure Issues and Concerns	It may include but is not limited to: - Latency Problems - Connectivity Issues - Resource Allocation Errors - Virtual Machine (VM) Failures
2. Operational Standards	It may include but is not limited to: - Performance Benchmarks - Service-Level Agreements (SLAs) - Business Continuity Policies - Best Practice Guidelines
3. Monitoring and Reporting Standards	It may include but is not limited to: - Real-Time Monitoring - System Log Review Protocols - Performance Reporting Schedules - Error Log Management
4. Anomalies and Alerts	It may include but is not limited to: - Resource Usage Spikes - Unexpected Latency - Network Congestion - Service Interruptions
5. Reporting Standards	It may include but is not limited to: - User Incident Reports - Automated System Alerts - Escalation Procedures - Root Cause Analysis Reports
6. Severity, Impact, and Urgency	It may include but is not limited to: - High, Medium, Low Priority - Immediate System Outages - Critical Business Impact - Routine Maintenance Issues
7. Troubleshooting Procedures	It may include but is not limited to: - Step-by-Step Resolution Guides

	- Diagnostic Protocols - Collaboration with Cloud Service Providers
8. Diagnostic Tools and Techniques	It may include but is not limited to: - CloudWatch - Azure Monitor - Datadog - Ping Tests - Packet Capture Tools
9. Best Practices	It may include but is not limited to: - Industry Standards for Cloud Operations - Vendor-Specific Troubleshooting Guides - Secure Issue Resolution Procedures
10. Post-Resolution Testing	It may include but is not limited to: - Performance Re-evaluation - Uptime Verification - Load Testing - Security Checks
11. Service-Level Agreements (SLAs)	It may include but is not limited to: - Uptime Guarantees - Performance Expectations - Response Time Commitments - Recovery Time Objectives (RTO)
12. Review Schedules	It may include but is not limited to: - Weekly Review - Monthly Review - Quarterly Review - Post-Incident Evaluation
13. Communication Protocols	It may include but is not limited to: - Email Notifications - Stakeholder Briefings - Automated Alerts - Incident Reports

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Assessed cloud infrastructure issues in accordance with organizational protocols. 1.2. Analyzed and documented common cloud-related problems based on operational standards. 1.3. Used diagnostic tools to identify cloud infrastructure issues and their root causes according to troubleshooting protocols.

	1.4. Implemented troubleshooting techniques to resolve cloud infrastructure issues following best practices and organizational policies. 1.5. Tested and validated issue resolutions to ensure cloud services are restored and fully operational according to organizational standards. 1.6. Documented the entire troubleshooting process, including issue identification, diagnosis, resolution, and post-resolution validation. 1.7. Reviewed and updated troubleshooting documentation to reflect new findings and improvements in line with organizational documentation protocols.
2. Resource Implications	The following resources should be provided: 2.1. Access to cloud infrastructure and monitoring tools (e.g., AWS, Azure, Google Cloud). 2.2. Diagnostic and troubleshooting tools (e.g., CloudWatch, New Relic, Azure Monitor). 2.3. Access to organizational documentation standards and service-level agreements (SLAs). 2.4. Support from stakeholders and team members for confirming issues and solutions. 2.5. Access to historical logs and reports of cloud infrastructure issues.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1. Direct observation 3.2. Review of documentation 3.3. Practical demonstrations 3.4. Questioning 3.5. Simulated tasks
4. Context for Assessment	Competency may be assessed in the workplace or in a simulated workplace environment. 4.1. Assessment should be conducted in an environment where the candidate can access real or simulated cloud infrastructure. 4.2. The candidate should be provided with the necessary resources and support to demonstrate their troubleshooting skills in line with organizational standards. 4.3. Simulated cloud environments may be used to replicate common infrastructure issues in a controlled setting for assessment purposes.

GLOSSARY OF TERMS

Access Control	Mechanisms that restrict and manage access to resources or systems based on user permissions and roles.
Access Permissions	The rights granted to a user or system to read, write, or execute files and resources on a network or system, based on assigned roles and security protocols.
Ansible	An open-source automation tool used for IT tasks such as configuration management, application deployment, and cloud provisioning.
Audit Logs	A chronological record of activities, such as changes in access or configurations, used for auditing and monitoring the security of a system or network.
Automation Tools	Software tools (e.g., Terraform, Ansible) used to automate the deployment and configuration of cloud infrastructure, reducing manual tasks and increasing efficiency.
Backup	The process of copying and archiving data to ensure it is preserved and recoverable in case of loss or corruption.
Cloud Computing	The delivery of computing services—including servers, storage, databases, networking, software, and analytics—over the internet ("the cloud").
Cloud Infrastructure	The hardware and software components—such as servers, storage, and networking—needed to support the computing requirements of a cloud environment.
Cloud Performance Metrics	Quantitative measurements (e.g., CPU usage, memory consumption, network traffic) used to assess the performance of cloud infrastructure.
Cloud Resource Utilization	The efficient management and allocation of cloud resources (e.g., storage, computing power) to ensure optimal performance and cost-effectiveness.
CloudWatch	A monitoring and observability service from AWS that provides data and actionable insights for cloud infrastructure and applications.
Compliance Standards	Set regulations and practices (e.g., GDPR, HIPAA) that govern the protection and management of data, ensuring that organizations meet legal and industry requirements.
Configuration	The setup of hardware, software, and services to meet the specific needs of a user, organization, or system, typically based on predefined requirements.

Data Center	A facility that houses computer systems and associated components, such as telecommunications and storage systems, used to manage large-scale data processing.
Data Encryption	The process of converting information or data into a secure format that can only be read by those with the proper decryption key or password.
Disaster Recovery	A set of policies and procedures designed to restore and protect IT infrastructure in the event of a disaster (e.g., data loss, server failure).
Firewall	A network security device or software that monitors and controls incoming and outgoing network traffic based on predefined security rules.
GDPR (General Data Protection Regulation)	A regulation in EU law on data protection and privacy that applies to all individuals within the European Union and the European Economic Area.
HIPAA (Health Insurance Portability and Accountability Act)	U.S. legislation that provides data privacy and security provisions for safeguarding medical information.
Identity and Access Management (IAM)	A framework of policies and technologies for ensuring that the right individuals or systems have the appropriate access to technology resources.
Load Balancing	A method used to distribute network or application traffic across multiple servers, ensuring no single server is overwhelmed, improving performance and reliability.
Monitoring Tools	Software used to observe and manage the health, performance, and security of cloud infrastructure or other IT systems (e.g., AWS CloudWatch, Azure Monitor).
Multi-Factor Authentication (MFA)	A security system that requires more than one method of authentication from independent categories of credentials to verify a user's identity.
Network Configuration	The process of setting up network components such as routers, switches, firewalls, and virtual networks to enable secure and efficient communication in a system.
Provisioning	The process of setting up and deploying cloud infrastructure resources, such as virtual machines, storage, and networks, based on predefined specifications.
Recovery Simulation	A testing process in which an organization simulates a failure or disaster to verify that its backup and recovery procedures are effective and meet required standards.

Role-Based Access Control (RBAC)	A method of restricting system access to authorized users based on their roles within an organization, ensuring that they only have access to what is necessary.
Scripting Languages	Programming languages (e.g., Python, Terraform, Ansible) used to automate the execution of tasks, often in system administration and cloud resource provisioning.
Security Protocols	Rules and guidelines that govern how data is secured and transmitted within a network or system, ensuring confidentiality, integrity, and authenticity.
Service-Level Agreement (SLA)	A formal agreement between a service provider and a customer that defines the expected level of service, performance, and responsibilities.
Storage Media	Physical devices (e.g., hard drives, SSDs, tapes) or cloud-based storage used to store digital data.
Subnets	A subdivision of an IP network that helps improve routing efficiency and enhance security by segregating parts of a larger network.
Terraform	An open-source infrastructure-as-code (IaC) tool that allows users to define and provision cloud resources using a high-level configuration language.
Testing Methodologies	Structured approaches to evaluating and verifying the functionality, performance, and security of systems and infrastructure, often used during cloud deployment.
Uptime Monitoring	The process of tracking and recording the availability and operational status of cloud infrastructure and services.
Version Control	The management of changes to documents, code, or other digital files, typically using tools (e.g., Git) to track modifications and maintain a history of revisions.
Virtual Machine (VM)	A software emulation of a physical computer that runs an operating system and applications just like a physical machine, used in cloud computing for scalability.
VPN (Virtual Private Network)	A secure, encrypted connection over the internet, often used to protect sensitive data and ensure privacy while accessing remote servers or networks.

ACKNOWLEDGEMENTS

The Technical Education and Skills Development Authority (TESDA) would like to recognize the commitment of the industry stakeholders and Area-Based and Demand Driven (ABDD) TVET Focals who provided their time and expertise for the development of this Competency Standards.

THE TECHNICAL EXPERT PANEL (TEP)

ARRISH C. ALTAVANO, LPT Southern Luzon Technological College Foundation, Inc., San Lorenzo St., Brgy. Kapitolyo, Pasig City	**MARCO L. YIMYAEM** Southern Luzon Technological College Foundation, Inc., Novaliches, Quezon City
JONATHAN DE LUZURIAGA Spring Valley Tech. Corp. Bago, Negros Occidental, Philippines	**JONATHAN P. CANTORA** Spring Valley Tech. Corp. Bago, Negros Occidental, Philippines
MARNIE S. TOLOSA Amazon Web Services Inc. 15F Arthaland Tower, Bonifacio Global City, Taguig City	**PAUL SEARS** Amazon Web Services Inc. 15F Arthaland Tower, Bonifacio Global City, Taguig City
BERNARD B. CHUA eCloudvalley Technology (Philippines) Inc. 8-01B 8th Floor, Accralaw Tower, 2nd Ave., cor. 30th St., BGC, Taguig City	**JONATHAN T. QUE** eCloudvalley Technology (Philippines) Inc. 8-01B 8th Floor, Accralaw Tower, 2nd Ave., cor. 30th St., BGC, Taguig City
MARK HANSLEY TAN eCloudvalley Technology (Philippines) Inc. 8-01B 8th Floor, Accralaw Tower, 2nd Ave., cor. 30th St., BGC, Taguig City	**LISANNE MARIE CHANTAL TUMANG** Education, eCloudvalley Technology (Philippines), Inc. 8-01B 8th Floor, Accralaw Tower, 2nd Ave., cor. 30th St., BGC, Taguig City
JENIFFER S. ARROYO eCloudvalley Technology (Philippines) Inc. 8-01B 8th Floor, Accralaw Tower, 2nd Ave., cor. 30th St., BGC, Taguig City	**MA. CECILIA B. DE BELEN** eCloudvalley Technology (Philippines) Inc. 8-01B 8th Floor, Accralaw Tower, 2nd Ave., cor. 30th St., BGC, Taguig City
ANNA LORENA S. SARMENTA eCloudvalley Technology (Philippines) Inc. 8-01B 8th Floor, Accralaw Tower, 2nd Ave., cor. 30th St., BGC, Taguig City	**CARLL EHVAN D. ILAGAN** eCloudvalley Technology (Philippines) Inc. 8-01B 8th Floor, Accralaw Tower, 2nd Ave., cor. 30th St., BGC, Taguig City
LANEA S. SAMONTE eCloudvalley Technology (Philippines) Inc. 8-01B 8th Floor, Accralaw Tower, 2nd Ave., cor. 30th St., BGC, Taguig City	**LEONARDO M. SALVADORA, JR.** eCloudvalley Technology (Philippines) Inc. 8-01B 8th Floor, Accralaw Tower, 2nd Ave., cor. 30th St., BGC, Taguig City

REDIE M. RAMOS eCloudvalley Technology (Philippines) Inc. 8-01B 8th Floor, Accralaw Tower, 2nd Ave., cor. 30th St., BGC, Taguig City	**TRYXZY ALCANTARA-MANANSALA** eCloudvalley Technology (Philippines) Inc. 8-01B 8th Floor, Accralaw Tower, 2nd Ave., cor. 30th St., BGC, Taguig City
KARLO JOSE TIDON Accenture 19/F Uptown Tower 3, 11th Avenue, Bonifacio Global City, Taguig City	**EARL CHRISTIANSON NG** Ng Khai Development Corp. eNGy Tech building, Hernan Cortes St., Banilad, Mandaue City, Cebu, Philippines
SONNY CARODAN Microsoft Philippines, Inc. 11F, One Ayala West Tower. Ayala Avenue cor Edsa, Brgy. San Lorenzo,. Makati City	

THE NCR ABDD TVET FOCALS

EDEN F. TUGADE TESDA-National Capital Region TESDA NCR Bldg., Gate 2, TESDA Complex, Taguig, 1630 Metro Manila	**LIZA MARIE V. GAWE** TESDA-PaMaMariSan 2ND Flr. NTTA Bldg., MPC Compound, Mayor Chanyungco St., Sta. Elena, Marikina City

The MANAGEMENT and STAFF of the TESDA Qualifications and Standards Office

Qualifications and Standards Office (QSO)

- **Dir. EL CID H. CASTILLO**, QSO
- **MS. BERNADETTE S. AUDIJE**, QSO-CSDD
- **MR. ADRIAN BRIAN C. SABANAL**, QSO-CSDD