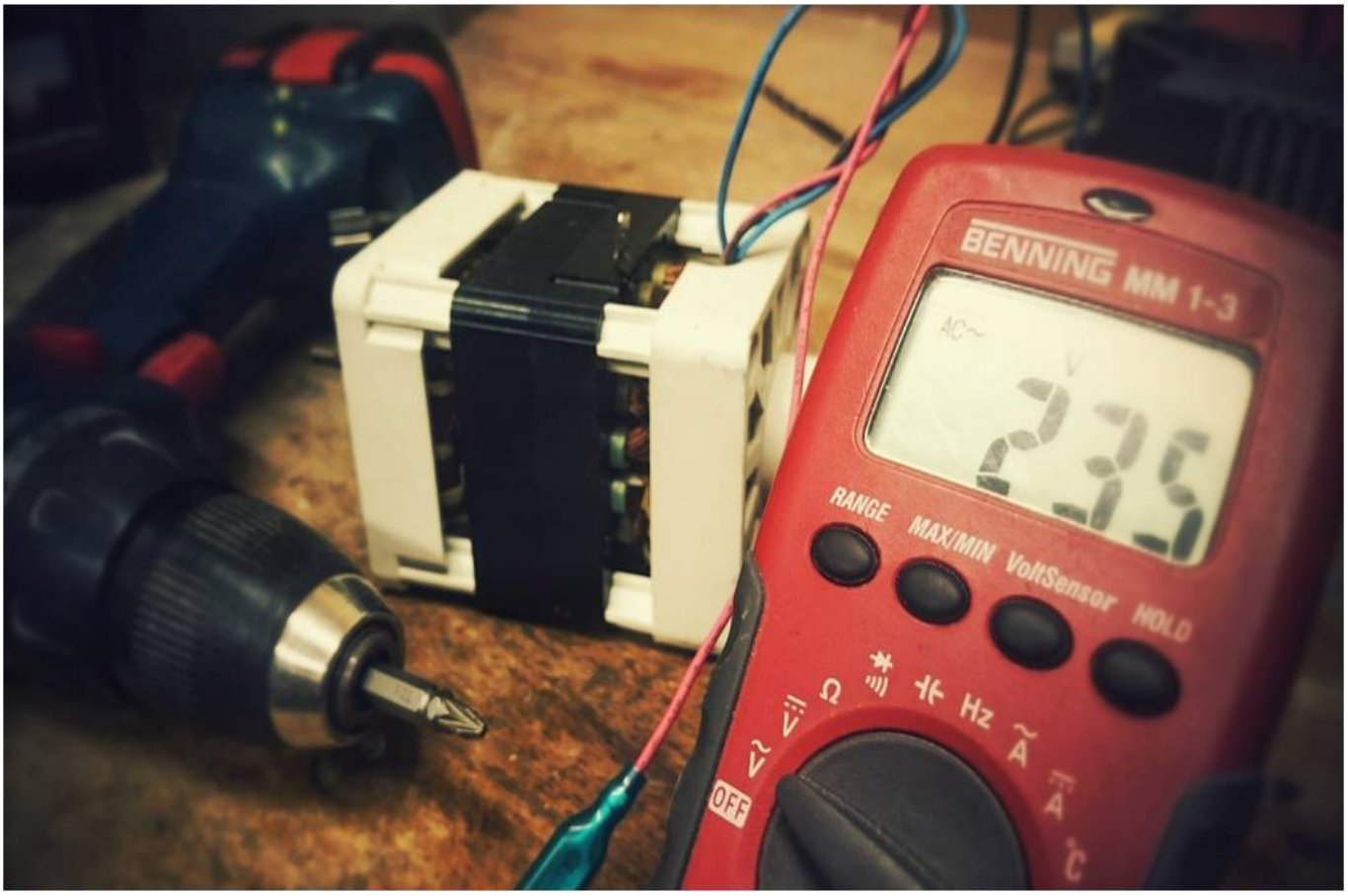
IASC SECTOR SKILL COUNCIL
एक कदम आत्मनिर्भरता की ओर

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
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Qualification Pack



Testing and Calibration Technician (Electrotechnical)

QP Code: IAS/Q5003

Version: 1.0

NSQF Level: 4

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Qualification Pack

IAS/Q5003: Testing and Calibration Technician (Electrotechnical)

Brief Job Description

The individual at work is responsible for calibration of electrotechnical parameters, such as AC/DC Voltage & Current, RLC and Q below 1GHz and temperature simulation, using authorised calibration setup and procedure in accordance to ISO/IEC 17025:2005 or equivalent standards.

Personal Attributes

This job requires the individual to be an effective communicator, disciplined, assertive, and a team player. The individual should also possess analytical and problem-solving skills and have the ability to work under pressure.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. IAS/N5006: Calibration of electrotechnical parameters
2. IAS/N5005: Performing pre-calibration activities
3. IAS/N5004: Preventive Maintenance and Task Reporting
4. IAS/N9001: Work effectively with teams
5. IAS/N9002: Health and safety in workplace
6. DGT/VSQ/N0102: Employability Skills (60 Hours)

Qualification Pack (QP) Parameters

Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Occupation	Testing and QA
Country	India
NSQF Level	4
Credits	15

Qualification Pack

Aligned to NCO/ISCO/ISIC Code	NCO-2015/ 7311.1001
Minimum Educational Qualification & Experience	10th grade pass plus 1-year NTC/ NAC (in relevant field) OR 10th grade pass with 1 Year of experience OR Completed 1st year of 3-year diploma (after 10th) and pursuing regular diploma OR Previous relevant Qualification of NSQF Level (NSQF Level 3) with 1 Year of experience
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	19 Years
Last Reviewed On	NA
Next Review Date	24/12/2025
NSQC Approval Date	24/12/2020
Version	1.0
Reference code on NQR	2022/CCM/IASC/06505
NQR Version	2

IAS/N5006: Calibration of electrotechnical parameters

Description

This OS unit is about calibration of a range of AC/DC voltage sources, current sources, function generators and similar instruments, such as passive resistors, inductors and capacitors (R, L, C)—either as single components or as a combination such as decade boxes and temperature simulators.

Scope

The scope covers the following :

- Perform calibration activities
- Calculate electrotechnical parameters

Elements and Performance Criteria

perform calibration activities

To be competent, the user/individual on the job must be able to:

PC1. identify the method of calibration, as requested in the Job Order, of different parameters such as AC/DC voltage sources, AC/DC current sources, function generators and other similar instruments, etc.

PC2. identify the comparison methods to be used (such as Difference Method, Null Method, Substitution Method, Direct/Automated Method etc.)

PC3. create an observation sheet and record the details of the UUC (company name, lab reference number, type, make, model, serial number, date, time, technician's name, etc.) as per the standard form/format specified in the SOP

PC4. ensure that while performing calibration to achieve Calibration and measurement capability (CMC), Test uncertainty Ratio (TUR) of preferably 3:1 must be followed

PC5. verify that the UUC is defect-free, i.e. it has no sign of physical damage, has readable markings, is clean

PC6. identify the reference instruments and components (i.e. divider, Digital multimeter, Oscilloscope, Multifunction Calibrator etc.) to use for the parameter measurements and ensure their functionalities

PC7. connect the reference equipment, the UUC and any other accessories as per the recommended configuration norms and method of calibration

PC8. select appropriate functions, parameters and range for the reference equipment and UUC

PC9. set up the recommended automation environment, if the measurements are automated, enable the software and enter the required configuration parameters as per the SOP documents

PC10. observe and record the readings of ambient temperature and relative humidity using recommended devices before calibration

PC11. ensure the reference equipment and the UUC has stabilised after calibration, as recommended by the manufacturer or the SOP

PC12. use hand gloves of specified material and any other handling SOP specified for handling the Unit Under Calibration (UUC)

calculate electrotechnical parameters

To be competent, the user/individual on the job must be able to:

PC13. identify parameters to measure, calculate the chosen parameters for the number of times as specified in the SOP document using the UUC and reference instruments and record the readings/observations of each calculation

PC14. perform the required calibration steps in a sequence and in case the measurements are automated, then ensure that the steps monitored on the HMI (computer display) are occurring as per SOP

PC15. use appropriate software/application for recording readings and messages in case of automated calculations of parameters

PC16. calculate the value of parameters from the true value by taking temperature and humidity error into account

PC17. select the calculation equation(s) for the type of calibration to be performed after referring to the SOP and the appropriate NOS

PC18. use the form/format specified in the SOP for performing calculations and recording observations

PC19. perform the required calculations using calculator (manually) or software (automated) as specified in the SOP for specific parameters

PC20. perform Type 'A' and Type 'B' uncertainty calculations based on measurement data as per SOP (estimation of measurement uncertainty such as U1 Uncertainty reported in the calibration certificate of the standard(s) / master(s), U2 Uncertainty arising from stability data of the measurement standard(s) / master(s) used for calibration, U3: Uncertainty from the resolution of the UUC, and so on)

PC21. record the results of calculations, including uncertainty, in the specified format

PC22. prepare post-calibration report in the format specified in the SOP and share the report with the designated persons/supervisor

PC23. return the reference instruments and accessories to their recommended storage conditions and positions

PC24. return the UUC to its recommended storage condition

PC25. fix/attach any recommended tag/markings on the UUC to signify that its calibration has been done

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation's SOPs for various calibrations performed

KU2. the requirements of maintaining environment and workplace properly for calibration operation and how this impacts the calibration readings and calculations

KU3. optimum calculation values for various parameters and instruments

KU4. UUC's optimum condition and values

KU5. how to follow the SOPs rigorously and takes guidance from the calibration supervisor when in doubt

KU6. how to record any non-compliance with the SOP, report it to the calibration supervisor and take guidance

KU7. electrotechnical calibration process and its impact on calibration accuracy

KU8. different calibration methods

KU9. the sources of errors in the calibration process, how these can be avoided and their impact on calibration accuracy

KU10. various calibration techniques, requirements, environments and tracing instruments

KU11. electrotechnical devices, their types, source of inaccuracies and equipment needed

KU12. how to derive calibration results—data processing and interpretation

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. record data in formats and checklist for electrotechnical calibration and reports

GS2. report for scheduled tasks, discrepancies and exceptions as per the organizational hierarchy and procedure

GS3. understand the company policy related to electrotechnical calibration environment, processes and equipment handling

GS4. identify the terminology, symbols, codes, standards, methods and common practices related to electrotechnical calibration

GS5. identify the data processing steps, uncertainty calculations and reporting of results related to electrotechnical calibration

GS6. consult with supervisor for calibration details and specific information about the UUC

GS7. prioritise daily tasks and batches of calibration efficiently and effectively to meet client and company needs

GS8. diagnose reasons for any down time in the calibration setup, provide possible solutions and discuss with the supervisor

GS9. think through the problem, risks and opportunities to evaluate the possible solution(s) and suggest an optimum /best possible solution(s) for mitigation and business optimisation

GS10. identify immediate or temporary solutions to resolve delays and discuss with the supervisor

GS11. use the existing information to arrive at actionable decision points for improving customer satisfaction

GS12. apply, analyse and evaluate the information gathered from observation, experience, reasoning or communication, as a guide for thought and action

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
perform calibration activities	**15**	**35**	**-**	**-**
PC1. identify the method of calibration, as requested in the Job Order, of different parameters such as AC/DC voltage sources, AC/DC current sources, function generators and other similar instruments, etc.	-	-	-	-
PC2. identify the comparison methods to be used (such as Difference Method, Null Method, Substitution Method, Direct/Automated Method etc.)	-	-	-	-
PC3. create an observation sheet and record the details of the UUC (company name, lab reference number, type, make, model, serial number, date, time, technician's name, etc.) as per the standard form/format specified in the SOP	-	-	-	-
PC4. ensure that while performing calibration to achieve Calibration and measurement capability (CMC), Test uncertainty Ratio (TUR) of preferably 3:1 must be followed	-	-	-	-
PC5. verify that the UUC is defect-free, i.e. it has no sign of physical damage, has readable markings, is clean	-	-	-	-
PC6. identify the reference instruments and components (i.e. divider, Digital multimeter, Oscilloscope, Multifunction Calibrator etc.) to use for the parameter measurements and ensure their functionalities	-	-	-	-
PC7. connect the reference equipment, the UUC and any other accessories as per the recommended configuration norms and method of calibration	-	-	-	-
PC8. select appropriate functions, parameters and range for the reference equipment and UUC	-	-	-	-
PC9. set up the recommended automation environment, if the measurements are automated, enable the software and enter the required configuration parameters as per the SOP documents	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. observe and record the readings of ambient temperature and relative humidity using recommended devices before calibration	-	-	-	-
PC11. ensure the reference equipment and the UUC has stabilised after calibration, as recommended by the manufacturer or the SOP	-	-	-	-
PC12. use hand gloves of specified material and any other handling SOP specified for handling the Unit Under Calibration (UUC)	-	-	-	-
calculate electrotechnical parameters	**20**	**30**	**-**	**-**
PC13. identify parameters to measure, calculate the chosen parameters for the number of times as specified in the SOP document using the UUC and reference instruments and record the readings/observations of each calculation	-	-	-	-
PC14. perform the required calibration steps in a sequence and in case the measurements are automated, then ensure that the steps monitored on the HMI (computer display) are occurring as per SOP	-	-	-	-
PC15. use appropriate software/application for recording readings and messages in case of automated calculations of parameters	-	-	-	-
PC16. calculate the value of parameters from the true value by taking temperature and humidity error into account	-	-	-	-
PC17. select the calculation equation(s) for the type of calibration to be performed after referring to the SOP and the appropriate NOS	-	-	-	-
PC18. use the form/format specified in the SOP for performing calculations and recording observations	-	-	-	-
PC19. perform the required calculations using calculator (manually) or software (automated) as specified in the SOP for specific parameters	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. perform Type 'A' and Type 'B' uncertainty calculations based on measurement data as per SOP (estimation of measurement uncertainty such as U1 Uncertainty reported in the calibration certificate of the standard(s) / master(s), U2 Uncertainty arising from stability data of the measurement standard(s) / master(s) used for calibration, U3: Uncertainty from the resolution of the UUC, and so on)	-	-	-	-
PC21. record the results of calculations, including uncertainty, in the specified format	-	-	-	-
PC22. prepare post-calibration report in the format specified in the SOP and share the report with the designated persons/supervisor	-	-	-	-
PC23. return the reference instruments and accessories to their recommended storage conditions and positions	-	-	-	-
PC24. return the UUC to its recommended storage condition	-	-	-	-
PC25. fix/attach any recommended tag/markings on the UUC to signify that its calibration has been done	-	-	-	-
NOS Total	**35**	**65**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N5006
NOS Name	Calibration of electrotechnical parameters
Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Occupation	Testing and QA
NSQF Level	4
Credits	3
Version	1.0
Last Reviewed Date	NA
Next Review Date	24/12/2025
NSQC Clearance Date	24/12/2020

IAS/N5005: Performing pre-calibration activities

Description

This OS unit is about ensuring appropriate calibration environment, readiness and usability of the calibration system and safety at the workplace as mandated by the organisation. The individual follows organisation specified handling methods and keeps the calibration equipment and setup in good order.

Scope

The scope covers the following :

- This unit/task covers the following:
- Analyse general calibration requirements to ensure presence of an optimal environment
- Inspect equipment, instruments and system required for calibration

Elements and Performance Criteria

analyse general calibration requirements to ensure presence of an optimal environment

To be competent, the user/individual on the job must be able to:

PC1. inspect the central air conditioning plants and other external factors to assess the temperature of the area/laboratory

PC2. inspect the room/area for any abnormal noise in the calibration area and assess the source of vibration in case felt (refer to SOP for acceptable noise level—usually less than 60dba)

PC3. check for lighting/ associated electrical equipment in the calibration installation area and match it with the recommended level of illumination (typically, 250- 500 Lux on the working table, or as specified in the SOP documents)

PC4. check for temporary/unsafe electrical wiring that may be put calibration in jeopardy

PC5. check for ambient temperature and humidity in the calibration area as specified in the SOP documents

PC6. inspect the environment parameters to analyse if they may adversely affect the required accuracy of measurement and report to the supervisor in case discrepancies are detected

PC7. check that the SOP norms for intensity and location of magnetic field sources, such as transformers, looped wires, ferrous materials, etc., in order to minimise magnetic interference in the measurements, especially for magnetic measurements such as inductor, etc.

PC8. ensure that Electromagnetic interference (EMI) and electromagnetic compatibility (EMC) norms are to be followed as per SOP for emission and immunity testing

PC9. ensure earthing norms are correctly followed for power supply, AC/DC mains and entire circuitry as per SOP in accordance with relevant specification (as per IS:3043 general standards earth resistance should be less than 1 ohm and earth to neutral voltage should be less than 1 volt)

PC10. inspect the calibration area/laboratory to ensure it is free from dust and external air pressure, and positive air pressure is normally maintained inside the laboratory to avoid ingress of dust

PC11. assess possible treatment to be given, as per standards and first-aid guidelines specified in the organizational documents, for electric shock

PC12. ensure that a wall chart listing emergency helpline numbers, steps to take for treatment of electric shock and proper first-aid procedure for the same is placed near the power supply switchgear and at other prominent places (as prescribed under Indian Electricity Rules 1956)

inspect equipment, instruments and system required for calibration

To be competent, the user/individual on the job must be able to:

PC13. check proper and correct RF/Microwave (1 GHz and Above), time and frequency (LF and HF, Time interval, Time Period) and temperature simulation are as per SOP documents

PC14. ensure that the power supply, usually from a UPS, is as per standards (e.g. ensure correct voltage, frequency, Total Harmonic Distortion or THD, transients, regulation, etc. are all as per SOP values

PC15. check that any installed isolation transformers, filters, etc. are not tampered with and the "hum" interference is within standard limits

PC16. assess the operation of heavy loads in the premises or nearby locations to ensure it does not cause any dip in voltage or transient currents that may adversely affect calibration and report any concerns to the relevant department

PC17. check for availability of instruments in the Electrotechnical Metrology Calibration setup

PC18. analyse requirements and arrange for protective measures, such as transient suppressors, to ensure that the laboratory is prepared for high current spikes and transients emanating from operation of heavy machines, surges in power supply and other such reasons

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation's SOPs for various calibrations that are performed

KU2. the requirements of maintaining ambient conditions for calibration

KU3. the role of calibration in the organisation (whether as a part of the end user production and quality assurance process or of a calibration service provider) and its impact on company business

KU4. electrotechnical calibration process and its impact on calibration accuracy

KU5. calibration methods— Comparison Method, Direct Method, Automated Method, Voltmeter-Ammeter Method

KU6. different types of measuring standards

KU7. procedure for connecting, setting up and operating different type of instruments

KU8. environmental requirements along with specified limits and their impact on calibration quality

KU9. standard environmental conditions to be maintained in the laboratory

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and write formats and checklist for workplace readiness, emails and messages in preferred language

GS2. analyse and collect product/instrument/system literature, working practices, safety information and manuals relevant for the job

GS3. communicate site conditions and issues to management, co-workers and supervisors

GS4. complete the job within the time frame as per the agreement

GS5. prioritise daily activities for the upkeep of calibration environment and instruments by ensuring availability of the calibration setup and its components

GS6. analyse the requirements of the customer and suggest most appropriate solution

GS7. provide support to the customers when they need help

GS8. analyse the problem, risks and opportunities to evaluate and suggest an optimum/best possible solution(s) for mitigation and business optimisation

GS9. identify immediate or temporary solutions to resolve delays

GS10. use existing information to arrive at actionable decision points for improving customer satisfaction

GS11. apply, analyse and evaluate the information gathered from observation, experience, reasoning or communication, as a guide for thought and action

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
analyse general calibration requirements to ensure presence of an optimal environment	**15**	**35**	**-**	**-**
PC1. inspect the central air conditioning plants and other external factors to assess the temperature of the area/laboratory	-	-	-	-
PC2. inspect the room/area for any abnormal noise in the calibration area and assess the source of vibration in case felt (refer to SOP for acceptable noise level—usually less than 60dba)	-	-	-	-
PC3. check for lighting/ associated electrical equipment in the calibration installation area and match it with the recommended level of illumination (typically, 250- 500 Lux on the working table, or as specified in the SOP documents)	-	-	-	-
PC4. check for temporary/unsafe electrical wiring that may be put calibration in jeopardy	-	-	-	-
PC5. check for ambient temperature and humidity in the calibration area as specified in the SOP documents	-	-	-	-
PC6. inspect the environment parameters to analyse if they may adversely affect the required accuracy of measurement and report to the supervisor in case discrepancies are detected	-	-	-	-
PC7. check that the SOP norms for intensity and location of magnetic field sources, such as transformers, looped wires, ferrous materials, etc., in order to minimise magnetic interference in the measurements, especially for magnetic measurements such as inductor, etc.	-	-	-	-
PC8. ensure that Electromagnetic interference (EMI) and electromagnetic compatibility (EMC) norms are to be followed as per SOP for emission and immunity testing	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC9. ensure earthing norms are correctly followed for power supply, AC/DC mains and entire circuitry as per SOP in accordance with relevant specification (as per IS:3043 general standards earth resistance should be less than 1 ohm and earth to neutral voltage should be less than 1 volt)	-	-	-	-
PC10. inspect the calibration area/laboratory to ensure it is free from dust and external air pressure, and positive air pressure is normally maintained inside the laboratory to avoid ingress of dust	-	-	-	-
PC11. assess possible treatment to be given, as per standards and first-aid guidelines specified in the organizational documents, for electric shock	-	-	-	-
PC12. ensure that a wall chart listing emergency helpline numbers, steps to take for treatment of electric shock and proper first-aid procedure for the same is placed near the power supply switchgear and at other prominent places (as prescribed under Indian Electricity Rules 1956)	-	-	-	-
inspect equipment, instruments and system required for calibration	**20**	**30**	**-**	**-**
PC13. check proper and correct RF/Microwave (1 GHz and Above), time and frequency (LF and HF, Time interval, Time Period) and temperature simulation are as per SOP documents	-	-	-	-
PC14. ensure that the power supply, usually from a UPS, is as per standards (e.g. ensure correct voltage, frequency, Total Harmonic Distortion or THD, transients, regulation, etc. are all as per SOP values	-	-	-	-
PC15. check that any installed isolation transformers, filters, etc. are not tampered with and the “hum” interference is within standard limits	-	-	-	-
PC16. assess the operation of heavy loads in the premises or nearby locations to ensure it does not cause any dip in voltage or transient currents that may adversely affect calibration and report any concerns to the relevant department	-	-	-	-
PC17. check for availability of instruments in the Electrotechnical Metrology Calibration setup	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC18. analyse requirements and arrange for protective measures, such as transient suppressors, to ensure that the laboratory is prepared for high current spikes and transients emanating from operation of heavy machines, surges in power supply and other such reasons	-	-	-	-
NOS Total	**35**	**65**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N5005
NOS Name	Performing pre-calibration activities
Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Occupation	Testing and QA
NSQF Level	4
Credits	3
Version	1.0
Last Reviewed Date	NA
Next Review Date	24/12/2025
NSQC Clearance Date	24/12/2020

IAS/N5004: Preventive Maintenance and Task Reporting

Description

This unit is about conducting regular preventive maintenance, reporting and record keeping activities of the calibration setup.

Scope

The scope covers the following :

- Perform visual checks and action.
- Complete preventive maintenance schedule.
- Perform task reporting.

Elements and Performance Criteria

Perform visual checks and action

To be competent, the user/individual on the job must be able to:

PC1. Prepare a list of devices and instruments for preventive maintenance

PC2. Carry out visual checks for system health check using sop of the organisation, and list observations and actions needed, if any

PC3. Check for any damaged cable, broken plug/socket and leakage current in all electrical/electronic instruments

PC4. Check validity of calibration certificate for all reference instruments, equipment and accessories

PC5. Check calibration instruments, meters and accessories for proper operation over their range

PC6. Check all environmental parameters for compliance with sop norms such as stray magnetic field, emi/emc, power source quality etc..

PC7. Consult calibration supervisor for guidance on how to measure the required parameters and whom to report issues as per sop

Complete preventive maintenance schedule

To be competent, the user/individual on the job must be able to:

PC8. Perform corrective action for the listed items as per recommended procedure in the sop

PC9. Work without tampering with any reference instrument or device, or making any adjustments - this must be done by an authorised calibration agency having due certification

PC10. Prepare preventive maintenance schedule list of electrotechnical calibration setup and accessories

PC11. Prepare corrective maintenance list and add to the list if the preventive maintenance procedure does not restore the device to the required condition

Perform task reporting

To be competent, the user/individual on the job must be able to:

PC12. Record the completed task in logbook or another document as defined by the sop

PC13. Report faults/issues to immediate supervisor

PC14. Perform entry of preventive maintenance check lists/reports

PC15. Report any visible changes in the electrotechnical calibration setup or its accessories to the supervisor

PC16. Report any theft in the electrotechnical calibration setup to the supervisor

PC17. Report any suspicious movement of new persons near the electrotechnical calibration setup to security and supervisor

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. preventive maintenance norms as defined by the company

KU2. scope of work for maintenance

KU3. maintenance policy of the company with respect to calibration strategy

KU4. troubleshooting of instruments and equipment

KU5. how to use calibration manuals when required

KU6. authorised cleaning solvents, greases and approved cleaning tissues/cloth/fibre for maintenance activities in the specified quantities

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. identify the formats and checklist for preventive maintenance planning and reports

GS2. write and read emails and messages about maintenance related issues

GS3. read company policy related to preventive maintenance

GS4. describe condition of control valves and accessories and notify co- workers and supervisor about any issues

GS5. communicate to the co-workers, supervisor and management in meetings about maintenance issues and limitations which need management attention

GS6. prioritise daily tasks and batches of calibration efficiently and effectively to meet client and company needs

GS7. diagnose reasons for any downtime in the calibration setup and provide possible solutions

GS8. use the existing information to arrive at actionable decision points for improving customer satisfaction

GS9. consult calibration supervisor on how to measure the required parameters in case of any discrepancy

GS10. apply, analyse and evaluate the information gathered from observation, experience, reasoning or communication to help in maintenance activities

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform visual checks and action	**10**	**20**	**-**	**-**
PC1. Prepare a list of devices and instruments for preventive maintenance	-	-	-	-
PC2. Carry out visual checks for system health check using sop of the organisation, and list observations and actions needed, if any	-	-	-	-
PC3. Check for any damaged cable, broken plug/socket and leakage current in all electrical/electronic instruments	-	-	-	-
PC4. Check validity of calibration certificate for all reference instruments, equipment and accessories	-	-	-	-
PC5. Check calibration instruments, meters and accessories for proper operation over their range	-	-	-	-
PC6. Check all environmental parameters for compliance with sop norms such as stray magnetic field, emi/emc, power source quality etc..	-	-	-	-
PC7. Consult calibration supervisor for guidance on how to measure the required parameters and whom to report issues as per sop	-	-	-	-
Complete preventive maintenance schedule	**15**	**25**	**-**	**-**
PC8. Perform corrective action for the listed items as per recommended procedure in the sop	-	-	-	-
PC9. Work without tampering with any reference instrument or device, or making any adjustments - this must be done by an authorised calibration agency having due certification	-	-	-	-
PC10. Prepare preventive maintenance schedule list of electrotechnical calibration setup and accessories	-	-	-	-
PC11. Prepare corrective maintenance list and add to the list if the preventive maintenance procedure does not restore the device to the required condition	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform task reporting	**10**	**20**	**-**	**-**
PC12. Record the completed task in logbook or another document as defined by the sop	-	-	-	-
PC13. Report faults/issues to immediate supervisor	-	-	-	-
PC14. Perform entry of preventive maintenance check lists/reports	-	-	-	-
PC15. Report any visible changes in the electrotechnical calibration setup or its accessories to the supervisor	-	-	-	-
PC16. Report any theft in the electrotechnical calibration setup to the supervisor	-	-	-	-
PC17. Report any suspicious movement of new persons near the electrotechnical calibration setup to security and supervisor	-	-	-	-
NOS Total	**35**	**65**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N5004
NOS Name	Preventive Maintenance and Task Reporting
Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Occupation	Testing and QA
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	NA
Next Review Date	24/12/2025
NSQC Clearance Date	24/12/2020

IAS/N9001: Work effectively with teams

Description

This NOS unit is about building relationships and working with people and groups inside and outside the organization, using skills and habits, to achieve the team goals and objectives.

Scope

The scope covers the following :

- Work as per organisational team environment
- Communicate effectively
- Co-operate with team members and superiors
- Respect customes / preferences and gender / ability differences "

Elements and Performance Criteria

Work as per the organisational team environment

To be competent, the user/individual on the job must be able to:

PC1. identify team objectives and goals, team members by name, their role and responsibilities, greet them appropriately and respond to their greetings

PC2. comply with organisation’s policies and procedures for working with team members within and outside the organisation—especially related to privacy, confidentiality and security

PC3. work as per the environment to build trust and mutual respect

PC4. participate in decision making by providing facts and figures, give / accept constructive suggestions, take initiatives to help team members arrive at workable decisions and meet the goals

PC5. accept decisions professionally and support even if they do not match suggestions and personal views

Communicate effectively

To be competent, the user/individual on the job must be able to:

PC6. communicate professionally as per organisation's protocols, using appropriate mode of communication—verbal, written, mail, phone or text—and clearly articulate the message to ensure that the receiver understands the message

PC7. listen to team members attentively, respond promptly, seek / provide clarifications if required

PC8. share important information with the team timely and refrain from overloading them with unnecessary and unsolicited information

Co-operate with team members and superiors

To be competent, the user/individual on the job must be able to:

PC9. perform own role, receive inputs from others and make adjustments within permissible rules as per requirement, to produce output in time for other team members to follow

PC10. help team members to perform their role effectively and provide any clarifications/support they need, including tools /equipment / common resources as well as resolve any contentious issues amicably, involving the team lead or the supervisor if needed

PC11. let team members know in good time if commitments cannot be carried out, explaining the reasons, and provide alternate solutions, if any; let the team lead know about this

PC12. act in the interest of the team and the organisation, take initiative to correct the wrong, seek help or escalate if needed to ensure that things do not 'fall through the gap' and team goals are achieved

Respect customs / preferences and gender / ability differences

To be competent, the user/individual on the job must be able to:

PC13. follow organisation's policies and statutory guidelines w.r.t seeking information about others' customs / preferences, making references or comments on social customs / preferences, and refrain from hurting sentiments

PC14. accommodate team members' preferences to the extent feasible, and in case they come in the way of fulfilling team goals, discuss with the supervisor/ team leader

PC15. ensure personal behaviour, conduct and communication styles, taking gender and disability of the person into consideration

PC16. list the different types of disabilities with their respective issues and ways to help them overcome challenges

PC17. use inclusive language, verbal as well as non-verbal, irrespective of the disability and the gender of the person

PC18. ensure equal treatment for all clients, colleagues and co-workers while respecting their personal space

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Organisation's policies on dress code , workplace behaviour , performance management,incentives,delivery standards,information security,etc.

KU2. Organisation's hierarchy and escalation matrix

KU3. importance of the individual's role in the workflow

KU4. work area inspection procedures and practices

KU5. different types of information that colleagues might need and the importance of providing this information when it is required

KU6. deeper understanding of actions and consequences of gender based behaviour

KU7. knowledge of gender based concepts, issues and legislation

KU8. organisation standards and guidelines to be followed for PwD and knowledge about laws, acts and provisions defined for PwD by the statutory bodies and the right way to use them including various medical conditions associated with PwD

KU9. health and safety requirements at workplace for PwD and information about various institutes working for PwD to enable in providing livelihood opportunities for PwD

KU10. rights and duties at workplace with respect to PwD and various government / private schemes and benefits available for PwD

KU11. process of recruiting people for a particular job profile w.r.t PwD and gender including rights and duties at workplace with respect to gender sensitivity

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. complete forms such as work orders, invoices and maintenance records

GS2. fill up appropriate forms,activity logs and attendance sheets as per the organisation's format in English and/or local language

GS3. write basic accident or incident report as witnessed in an appropriate format to the relevant authority

GS4. read warnings, instructions and other text material on product labels, components, etc.

GS5. read relevant signage, warnings, labels or descriptions on equipment, etc. while carrying out work activities

GS6. listen effectively and orally communicate information

GS7. ask for clarification and advice from the concerned person

GS8. make decisions on a suitable course of action or response keeping in view resource utilisation while meeting

GS9. plan and organise work to achieve targets and deadlines

GS10. understand needs of the customer, suggest most appropriate solution and support them whenever needed

GS11. match symptoms of the fault noticed to the cause of the problem

GS12. anticipate and avoid hazards that may occur during repairs because of tools, materials used or repair processes

GS13. spot process disruptions and delays

GS14. practice and acceptance of gender and its concepts

GS15. develop empathy across genders and towards PwD

GS16. reflect on own gender identity, gender roles and PwD issues

GS17. engage and participate in discussions to end gender and disability discrimination

GS18. improve and modify work practices

GS19. maintain positive and effective relationships with colleagues and customers

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Work as per the organisational team environment	**15**	**8**	**-**	**5**
PC1. identify team objectives and goals, team members by name, their role and responsibilities, greet them appropriately and respond to their greetings	4	4	-	-
PC2. comply with organisation's policies and procedures for working with team members within and outside the organisation—especially related to privacy, confidentiality and security	4	-	-	2
PC3. work as per the environment to build trust and mutual respect	2	-	-	1
PC4. participate in decision making by providing facts and figures, give / accept constructive suggestions, take initiatives to help team members arrive at workable decisions and meet the goals	4	4	-	1
PC5. accept decisions professionally and support even if they do not match suggestions and personal views	1	-	-	1
Communicate effectively	**6**	**10**	**-**	**1**
PC6. communicate professionally as per organisation's protocols, using appropriate mode of communication—verbal, written, mail, phone or text—and clearly articulate the message to ensure that the receiver understands the message	2	6	-	1
PC7. listen to team members attentively, respond promptly, seek / provide clarifications if required	2	-	-	-
PC8. share important information with the team timely and refrain from overloading them with unnecessary and unsolicited information	2	4	-	-
Co-operate with team members and superiors	**8**	**18**	**-**	**1**
PC9. perform own role, receive inputs from others and make adjustments within permissible rules as per requirement, to produce output in time for other team members to follow	2	6	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. help team members to perform their role effectively and provide any clarifications/support they need, including tools /equipment / common resources as well as resolve any contentious issues amicably, involving the team lead or the supervisor if needed	-	6	-	1
PC11. let team members know in good time if commitments cannot be carried out, explaining the reasons, and provide alternate solutions, if any; let the team lead know about this	2	-	-	-
PC12. act in the interest of the team and the organisation, take initiative to correct the wrong, seek help or escalate if needed to ensure that things do not 'fall through the gap' and team goals are achieved	4	6	-	-
Respect customs / preferences and gender / ability differences	**11**	**14**	**-**	**3**
PC13. follow organisation's policies and statutory guidelines w.r.t seeking information about others' customs / preferences, making references or comments on social customs / preferences, and refrain from hurting sentiments	2	4	-	-
PC14. accommodate team members' preferences to the extent feasible, and in case they come in the way of fulfilling team goals, discuss with the supervisor/ team leader	2	-	-	1
PC15. ensure personal behaviour, conduct and communication styles, taking gender and disability of the person into consideration	2	6	-	1
PC16. list the different types of disabilities with their respective issues and ways to help them overcome challenges	1	-	-	1
PC17. use inclusive language, verbal as well as non-verbal, irrespective of the disability and the gender of the person	2	4	-	-
PC18. ensure equal treatment for all clients, colleagues and co-workers while respecting their personal space	2	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N9001
NOS Name	Work effectively with teams
Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Occupation	Generic
NSQF Level	4
Credits	1
Version	4.0
Last Reviewed Date	NA
Next Review Date	26/05/2025
NSQC Clearance Date	26/05/2022

IAS/N9002: Health and safety in workplace

Description

This OS unit is about following adequate safety procedures to make work environment safe

Scope

The scope covers the following :

- Adhere to standard safety procedures of the company
- Maintain good health and posture
- Effective waste management/recycling practices
- Adopt learning and self-direction
- Develop system thinking in problem solving
- Material/Resources conservation practices

Elements and Performance Criteria

Adhere to standard safety procedures of the company

To be competent, the user/individual on the job must be able to:

PC1. comply with general safety procedures and those for handling an equipment, hazardous material or tool, followed in the company

PC2. remove finger rings or any other metal objects likely to interfere with the work before working on the unit

PC3. use of safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc.

PC4. escalate the issue about hazardous materials or things found in the premises or any breach of safety procedure in the company

PC5. ensure zero accidents at work

PC6. avoid damage of components due to negligence in ESD procedures or any other loss due to safety negligence

PC7. participate regularly in fire drills or other safety related workshops organised by the company

Maintain good health and posture

To be competent, the user/individual on the job must be able to:

PC8. maintain appropriate posture, especially in long hours of sitting or standing position and in handling heavy materials

PC9. participate in company organised health sessions such as yoga, physiotherapy or games

PC10. handle heavy and hazardous materials with care, while maintaining appropriate posture, using suitable tools and handling equipment such as trolleys, jacks and ladders

Effective waste management/recycling practices

To be competent, the user/individual on the job must be able to:

PC11. identify recyclable and non-recyclable, and hazardous waste generated to be segregated accordingly

PC12. dispose non-recyclable waste and hazardous waste as per recommended processes

PC13. deposit recyclable and reusable material at identified location

Adopt learning and self-direction

To be competent, the user/individual on the job must be able to:

PC14. understand importance of skill advancement and develop mastery

PC15. adapt product / service to meet success criteria

PC16. understand accountability for timely completion of tasks

PC17. manage to express emotions in appropriate ways at workplace and understand the cause for the emotions

Develop system thinking in problem solving

To be competent, the user/individual on the job must be able to:

PC18. analyse the problem accurately and communicate different possible solutions to the problem

PC19. manage to estimate the cause of the problem and validate

Material/Resources conservation practices

To be competent, the user/individual on the job must be able to:

PC20. identify ways to optimize usage of material including water and electricity / energy in various tasks/activities/processes

PC21. check for spills/leakages in various tasks/activities/processes and plug them or escalate to appropriate authority

PC22. carry out routine cleaning of tools, machines and equipment

PC23. check if the equipment/machine is functioning normally before commencing work and rectify wherever required and report malfunctioning (fumes/sparks/emission/vibration/noise) or any lapse in maintenance of equipment

PC24. ensure electrical equipment and appliances are properly connected and turned off when not in use

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. company's policies on incentives,delivery standards, and personnel management

KU2. company occupational safety and health policy

KU3. company emergency evacuation procedure

KU4. Company's medical policy

KU5. how to maintain the work area safe and secure

KU6. how to handle hazardous materials, tools and equipment

KU7. procedures to be followed during emergencies such as fire accidents, electrocution, etc.

KU8. long term value of good posture and use of appropriate handling equipment

KU9. electrical grounding practices

KU10. safety regulations and standards and how to apply these

KU11. common sources of pollution and ways to minimize it

KU12. categorisation of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics

KU13. usage of different colours of dustbins
KU14. waste management and methods of waste disposal
KU15. organisation's procedures for minimizing mistakes
KU16. strategies pertinent to their field (such as internet searches, asking peers and managers, enrolling for courses and certifications, etc.) that can be used to pursue an advancement in their skills
KU17. one should be able to identify the key performance indicators for the new tasks
KU18. seek feedback from supervisor and deal in constructive manner
KU19. understand that emotions are accompained by a physical state, thought and feeling
KU20. one should be able to interpret timelines and goals set by the manager and break them into sub-goals and tasks
KU21. importance of quality and timely delivery of the product/service
KU22. potential hazards, risks and threats based on the nature of work
KU23. ways of efficiently managing material and water in the process
KU24. layout of the workstation and electrical and thermal equipment used
KU25. efficient and inefficient utilization of material and water
KU26. basics of electricity and prevalent energy efficient devices
KU27. ways to recognize common electrical problems
KU28. common practices of conserving electricity

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. fill up appropriate forms, activity logs and attendance sheets as per organisation's format in English and/or local language
GS2. write basic accident or incident report as witnessed in appropriate format to relevant authority
GS3. read/listen and interpret information correctly from relevant instruction documents, manuals, health and safety instructions, memos, etc. applicable to the job, in English and/or local language
GS4. read relevant signage, warnings, labels or descriptions on equipment, etc. while carrying out work activities
GS5. question co-workers in order to understand the safety and health issues
GS6. inform co-workers about safety and health issues
GS7. report issues and problems relating to safety and health to managers in clear terms
GS8. make decisions pertaining to safety and health issues at workplace
GS9. plan and organise work conforming to the safety and health norms of the company
GS10. make decisions about escalating safety and health issues at workplace to managers
GS11. discuss problems related to safety and health, evaluate the possible solution(s) and arrive at optimum /best possible solution(s) in consultation with concerned people
GS12. use the existing information to arrive at actionable decision points
GS13. use the existing information for improving customer satisfaction

GS14. use the existing information to optimise solution and company business

GS15. analyse problems and identify causes and possible solutions

GS16. apply, analyse and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action

GS17. anticipate problems, risks and opportunities and utilise these for mitigation and business optimisation

GS18. communicate with colleagues on the significance of greening of jobs

GS19. identify cause and effect of greening of jobs

GS20. record data on waste disposal at workplace

GS21. demonstrate commitment towards self, and initiative to advance skills levels by exploring various pathways to expand one's own learning

GS22. incorporate feedback into one's mental model of task, and bring it into practice

GS23. be punctual, utilize time and manage workload efficiently

GS24. evaluate strategies to maintain, enhance or reduce the intensity of heightened emotional response

GS25. test a hypothesis about the cause of the problem

GS26. identify and ask significant questions to clarify the various points of view on the problem to better understand the problem

GS27. record data on waste disposal at workplace

GS28. make timely decisions for efficient utilization of resources

GS29. complete statutory documents relevant to safety and hygiene

GS30. read Standard Operating Practices (SOP) documents

GS31. communicate with colleagues on the significance of greening of jobs

GS32. complete tasks efficiently and accurately within stipulated time

GS33. work with supervisors/team members to carry out work related tasks

GS34. identify cause and effect of greening of jobs

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Adhere to standard safety procedures of the company	**13**	**12**	**-**	**5**
PC1. comply with general safety procedures and those for handling an equipment, hazardous material or tool, followed in the company	2	2	-	1
PC2. remove finger rings or any other metal objects likely to interfere with the work before working on the unit	2	4	-	-
PC3. use of safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc.	4	2	-	1
PC4. escalate the issue about hazardous materials or things found in the premises or any breach of safety procedure in the company	1	1	-	-
PC5. ensure zero accidents at work	1	1	-	1
PC6. avoid damage of components due to negligence in ESD procedures or any other loss due to safety negligence	1	1	-	1
PC7. participate regularly in fire drills or other safety related workshops organised by the company	2	1	-	1
Maintain good health and posture	**6**	**8**	**-**	**1**
PC8. maintain appropriate posture, especially in long hours of sitting or standing position and in handling heavy materials	2	3	-	1
PC9. participate in company organised health sessions such as yoga, physiotherapy or games	2	1	-	-
PC10. handle heavy and hazardous materials with care, while maintaining appropriate posture, using suitable tools and handling equipment such as trolleys, jacks and ladders	2	4	-	-
Effective waste management/recycling practices	**4**	**5**	**-**	**1**
PC11. identify recyclable and non-recyclable, and hazardous waste generated to be segregated accordingly	2	1	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. dispose non-recyclable waste and hazardous waste as per recommended processes	1	3	-	-
PC13. deposit recyclable and reusable material at identified location	1	1	-	-
Adopt learning and self-direction	**4**	**5**	**-**	**1**
PC14. understand importance of skill advancement and develop mastery	1	1	-	1
PC15. adapt product / service to meet success criteria	1	2	-	-
PC16. understand accountability for timely completion of tasks	1	1	-	-
PC17. manage to express emotions in appropriate ways at workplace and understand the cause for the emotions	1	1	-	-
Develop system thinking in problem solving	**2**	**2**	**-**	**1**
PC18. analyse the problem accurately and communicate different possible solutions to the problem	1	1	-	-
PC19. manage to estimate the cause of the problem and validate	1	1	-	1
Material/Resources conservation practices	**11**	**18**	**-**	**1**
PC20. identify ways to optimize usage of material including water and electricity / energy in various tasks/activities/processes	2	2	-	-
PC21. check for spills/leakages in various tasks/activities/processes and plug them or escalate to appropriate authority	1	2	-	-
PC22. carry out routine cleaning of tools, machines and equipment	3	6	-	-
PC23. check if the equipment/machine is functioning normally before commencing work and rectify wherever required and report malfunctioning (fumes/sparks/emission/vibration/noise) or any lapse in maintenance of equipment	3	4	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC24. ensure electrical equipment and appliances are properly connected and turned off when not in use	2	4	-	1
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N9002
NOS Name	Health and safety in workplace
Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Occupation	Generic
NSQF Level	4
Credits	1
Version	2.0
Last Reviewed Date	NA
Next Review Date	11/08/2025
NSQC Clearance Date	11/08/2020

DGT/VSQ/N0102: Employability Skills (60 Hours)

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

Elements and Performance Criteria

Introduction to Employability Skills

To be competent, the user/individual on the job must be able to:

PC1. identify employability skills required for jobs in various industries

PC2. identify and explore learning and employability portals

Constitutional values – Citizenship

To be competent, the user/individual on the job must be able to:

PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.

PC4. follow environmentally sustainable practices

Becoming a Professional in the 21st Century

To be competent, the user/individual on the job must be able to:

PC5. recognize the significance of 21st Century Skills for employment

PC6. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

Basic English Skills

To be competent, the user/individual on the job must be able to:

PC7. use basic English for everyday conversation in different contexts, in person and over the telephone

PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English

PC9. write short messages, notes, letters, e-mails etc. in English

Career Development & Goal Setting

To be competent, the user/individual on the job must be able to:

PC10. understand the difference between job and career

PC11. prepare a career development plan with short- and long-term goals, based on aptitude

Communication Skills

To be competent, the user/individual on the job must be able to:

PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings

PC13. work collaboratively with others in a team

Diversity & Inclusion

To be competent, the user/individual on the job must be able to:

PC14. communicate and behave appropriately with all genders and PwD

PC15. escalate any issues related to sexual harassment at workplace according to POSH Act

Financial and Legal Literacy

To be competent, the user/individual on the job must be able to:

PC16. select financial institutions, products and services as per requirement

PC17. carry out offline and online financial transactions, safely and securely

PC18. identify common components of salary and compute income, expenses, taxes, investments etc

PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation

Essential Digital Skills

To be competent, the user/individual on the job must be able to:

PC20. operate digital devices and carry out basic internet operations securely and safely

PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively

PC22. use basic features of word processor, spreadsheets, and presentations

Entrepreneurship

To be competent, the user/individual on the job must be able to:

PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research

PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion

PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

Customer Service

To be competent, the user/individual on the job must be able to:

PC26. identify different types of customers

PC27. identify and respond to customer requests and needs in a professional manner.

PC28. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

To be competent, the user/individual on the job must be able to:

PC29. create a professional Curriculum vitae (Résumé)

PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

PC31. apply to identified job openings using offline /online methods as per requirement

PC32. answer questions politely, with clarity and confidence, during recruitment and selection

PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. need for employability skills and different learning and employability related portals

KU2. various constitutional and personal values

KU3. different environmentally sustainable practices and their importance

KU4. Twenty first (21st) century skills and their importance

KU5. how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up

KU6. importance of career development and setting long- and short-term goals

KU7. about effective communication

KU8. POSH Act

KU9. Gender sensitivity and inclusivity

KU10. different types of financial institutes, products, and services

KU11. how to compute income and expenditure

KU12. importance of maintaining safety and security in offline and online financial transactions

KU13. different legal rights and laws

KU14. different types of digital devices and the procedure to operate them safely and securely

KU15. how to create and operate an e- mail account and use applications such as word processors, spreadsheets etc.

KU16. how to identify business opportunities

KU17. types and needs of customers

KU18. how to apply for a job and prepare for an interview

KU19. apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and write different types of documents/instructions/correspondence

GS2. communicate effectively using appropriate language in formal and informal settings

GS3. behave politely and appropriately with all
GS4. how to work in a virtual mode
GS5. perform calculations efficiently
GS6. solve problems effectively
GS7. pay attention to details
GS8. manage time efficiently
GS9. maintain hygiene and sanitization to avoid infection

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Introduction to Employability Skills	**1**	**1**	**-**	**-**
PC1. identify employability skills required for jobs in various industries	-	-	-	-
PC2. identify and explore learning and employability portals	-	-	-	-
Constitutional values – Citizenship	**1**	**1**	**-**	**-**
PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC4. follow environmentally sustainable practices	-	-	-	-
Becoming a Professional in the 21st Century	**2**	**4**	**-**	**-**
PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC6. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
Basic English Skills	**2**	**3**	**-**	**-**
PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC9. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
Career Development & Goal Setting	**1**	**2**	**-**	**-**

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. understand the difference between job and career	-	-	-	-
PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
Communication Skills	**2**	**2**	**-**	**-**
PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
PC13. work collaboratively with others in a team	-	-	-	-
Diversity & Inclusion	**1**	**2**	**-**	**-**
PC14. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
Financial and Legal Literacy	**2**	**3**	**-**	**-**
PC16. select financial institutions, products and services as per requirement	-	-	-	-
PC17. carry out offline and online financial transactions, safely and securely	-	-	-	-
PC18. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
Essential Digital Skills	**3**	**4**	**-**	**-**
PC20. operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Entrepreneurship	**2**	**3**	**-**	**-**
PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
Customer Service	**1**	**2**	**-**	**-**
PC26. identify different types of customers	-	-	-	-
PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
PC28. follow appropriate hygiene and grooming standards	-	-	-	-
Getting ready for apprenticeship & Jobs	**2**	**3**	**-**	**-**
PC29. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC31. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total	**20**	**30**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0102
NOS Name	Employability Skills (60 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	31/08/2023
Next Review Date	31/08/2026
NSQC Clearance Date	31/08/2023

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.

2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.

3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).

4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.

5. In case of successfully passing only certain number of NOSs, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

6. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

Minimum Aggregate Passing % at QP Level : 70

(**Please note**: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
IAS/N5006.Calibration of electrotechnical parameters	35	65	-	-	100	30
IAS/N5005.Performing pre-calibration activities	35	65	-	-	100	20
IAS/N5004.Preventive Maintenance and Task Reporting	35	65	-	-	100	15
IAS/N9001.Work effectively with teams	40	50	-	10	100	10
IAS/N9002.Health and safety in workplace	40	50	-	10	100	15
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	0	0	50	10
Total	**205**	**325**	**0**	**0**	**550**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.