



Refrigeration Technician - Food Processing Facility

QP Code: FIC/Q9502

Version: 1.0

NSQF Level: 4

Food Industry Capacity & Skill Initiative || Shriram Bharatiya Kala kendra, 3rd floor, 1, Copernicus Marg, Mandi House, New Delhi
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Qualification Pack

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FIC/Q9502: Refrigeration Technician - Food Processing Facility

Brief Job Description

The incumbent in the job is responsible for the operation and maintenance of refrigeration system in a food processing facility. The individual also performs inspection, testing and repair of refrigeration system to ensure it is operating effectively.

Personal Attributes

The individual in the job must be able to prioritise tasks, pay attention to details and possess manual dexterity. The individual must also be able to communicate and work in a team effectively.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [FIC/N9503: Carry out preventive maintenance of refrigeration system at food processing workplace](#)
2. [FIC/N9502: Operate refrigeration systems at food processing workplace](#)
3. [FIC/N9501: Prepare work area and refrigeration equipment](#)
4. [SGJ/N1702: Optimize resource utilization at workplace](#)
5. [FIC/N9901: Implement health and safety practices at the workplace](#)
6. [FIC/N9902: Work effectively in an organisation](#)

Qualification Pack (QP) Parameters

Sector	Food Processing
Sub-Sector	Generic
Occupation	Utilities and Maintenance
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7127.010

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Minimum Educational Qualification & Experience	12th Class (science stream) OR 10th Class (and 2 years course in relevant stream) OR 10th Class with 2 Years of experience relevant experience OR 10th Class + I.T.I (2 years)
Minimum Level of Education for Training in School	Not Applicable
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	29/07/2021
Next Review Date	29/07/2024
Deactivation Date	29/07/2024
NSQC Approval Date	29/07/2021
Version	1.0
Reference code on NQR	2021/FI/FICSI/04382
NQR Version	1

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FIC/N9503: Carry out preventive maintenance of refrigeration system at food processing workplace

Description

This NOS unit is about carrying out preventive maintenance of refrigeration system.

Scope

The scope covers the following :

- Prepare for maintenance work
- Carry out preventive maintenance of the refrigeration system and cold storage facility
- Carry out post-maintenance tasks for refrigeration systems

Elements and Performance Criteria

Prepare for maintenance work

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

- PC1.** identify the scope of work from various sources such as instructions from senior personnel, organisational guidelines, type of refrigeration system, maintenance cycle, etc.
- PC2.** plan the tasks to be performed as per standard practice and organisational checklists
- PC3.** identify and arrange the tools, consumables, spare parts etc. required during the maintenance tasks

Carry out preventive maintenance of the refrigeration system and cold storage facility

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

- PC4.** check the cold storage or refrigeration system components including temperature controllers, recorders; defrost controls, position of defrost heaters, voltage at each heater terminal, drain line heater (in case of maintaining freezing temperature), evaporators for ice accumulation/proper defrosting, condenser fan, compressor unit etc. for possible defects thoroughly
- PC5.** check all wirings and electrical connections for any damage, loose connections, etc.
- PC6.** check the functioning and condition of pressure and safety controls, solenoid valves, cold room temperature thermostat, refrigerant line insulation, etc.
- PC7.** repair or replace the parts, wiring and electrical connections in case of any defect or problem as per the organisational procedures
- PC8.** clean the drain pan, condenser and evaporator coils to remove dust and foreign materials by following organisational procedures
- PC9.** check oil level in the system and ensure that there is no leakage and required level is maintained in the system
- PC10.** check any leakage and discharge in the refrigerant and add or charge it, as required
- PC11.** observe the cold storage operations for any malfunctions/defects and immediately inform the supervisor/maintenance team for corrections

Carry out post-maintenance tasks for refrigeration systems

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

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- PC12.** assemble back the covers, guards, clamps, insulation etc. of the equipment after inspection and repairing work
- PC13.** conduct trials of the system to verify that system is working effectively and specified parameters are attained with no abnormalities
- PC14.** dispose-off waste materials such as oil, failed parts/aggregates safely while ensuring no contact with the raw material, processed food, packaging material, etc.
- PC15.** ensure that all maintenance activities are adequately addressed and report the superiors about maintenance activities done on the refrigeration system and cold storage facility
- PC16.** obtain approval from the supervisor post maintenance of refrigeration system and cold storage facility
- PC17.** record information such as type of maintenance performed, parts replaced, parts installed, repairs done, etc. and fill out forms, checklists as per organisational practice

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** cleaning, food safety and hygiene standards and procedures followed in the organization pertaining to food storage
- KU2.** various types of food products that are stored in refrigeration systems
- KU3.** importance of refrigeration systems in food processing industry
- KU4.** applicable Food Safety and Standards Authority of India (FSSAI) regulations for refrigeration in food processing industry
- KU5.** the types of chemicals, materials, tools and equipment required during the work process
- KU6.** the cleaning process to disinfect work area and equipment/ tools
- KU7.** how to use and handle cleaning sanitizers and cleaners safely
- KU8.** safe disposal of waste and hazardous materials from the work area
- KU9.** Standard Operating Procedures (SOP) recommended by original equipment manufacturers (OEM) for using tools, gauges and equipment required during operation and maintenance of refrigeration system

Generic Skills (GS)

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

- GS1.** read manuals, SOPs, health and safety instructions etc.
- GS2.** write any work-related information in English/regional language
- GS3.** communicate the requirements to the supervisor and co-workers
- GS4.** analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
- GS5.** complete the assigned tasks as per schedule
- GS6.** plan and organise work according to the work requirements
- GS7.** explore new approach of doing things to resolve issues
- GS8.** pay attention to equipment/apparatus operations detail

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare for maintenance work</i>	4	5	-	3
PC1. identify the scope of work from various sources such as instructions from senior personnel, organisational guidelines, type of refrigeration system, maintenance cycle, etc.	-	-	-	-
PC2. plan the tasks to be performed as per standard practice and organisational checklists	-	-	-	-
PC3. identify and arrange the tools, consumables, spare parts etc. required during the maintenance tasks	-	-	-	-
<i>Carry out preventive maintenance of the refrigeration system and cold storage facility</i>	20	35	-	14
PC4. check the cold storage or refrigeration system components including temperature controllers, recorders; defrost controls, position of defrost heaters, voltage at each heater terminal, drain line heater (in case of maintaining freezing temperature), evaporators for ice accumulation/proper defrosting, condenser fan, compressor unit etc. for possible defects thoroughly	-	-	-	-
PC5. check all wirings and electrical connections for any damage, loose connections, etc.	-	-	-	-
PC6. check the functioning and condition of pressure and safety controls, solenoid valves, cold room temperature thermostat, refrigerant line insulation, etc.	-	-	-	-
PC7. repair or replace the parts, wiring and electrical connections in case of any defect or problem as per the organisational procedures	-	-	-	-
PC8. clean the drain pan, condenser and evaporator coils to remove dust and foreign materials by following organisational procedures	-	-	-	-
PC9. check oil level in the system and ensure that there is no leakage and required level is maintained in the system	-	-	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. check any leakage and discharge in the refrigerant and add or charge it, as required	-	-	-	-
PC11. observe the cold storage operations for any malfunctions/defects and immediately inform the supervisor/maintenance team for corrections	-	-	-	-
<i>Carry out post-maintenance tasks for refrigeration systems</i>	6	10	-	3
PC12. assemble back the covers, guards, clamps, insulation etc. of the equipment after inspection and repairing work	-	-	-	-
PC13. conduct trials of the system to verify that system is working effectively and specified parameters are attained with no abnormalities	-	-	-	-
PC14. dispose-off waste materials such as oil, failed parts/aggregates safely while ensuring no contact with the raw material, processed food, packaging material, etc.	-	-	-	-
PC15. ensure that all maintenance activities are adequately addressed and report the superiors about maintenance activities done on the refrigeration system and cold storage facility	-	-	-	-
PC16. obtain approval from the supervisor post maintenance of refrigeration system and cold storage facility	-	-	-	-
PC17. record information such as type of maintenance performed, parts replaced, parts installed, repairs done, etc. and fill out forms, checklists as per organisational practice	-	-	-	-
NOS Total	30	50	-	20

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National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9503
NOS Name	Carry out preventive maintenance of refrigeration system at food processing workplace
Sector	Food Processing
Sub-Sector	Generic
Occupation	Utilities and Maintenance
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	29/07/2021
Next Review Date	29/07/2024
NSQC Clearance Date	29/07/2021

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FIC/N9502: Operate refrigeration systems at food processing workplace

Description

This NOS unit is about operating refrigeration systems to ensure materials are stored safely in a food processing workplace.

Scope

The scope covers the following :

- Pre-start up checks of refrigeration system
- Operate a cold storage or refrigeration system
- Storage of food in cold storage room

Elements and Performance Criteria

Pre-start up checks of refrigeration system

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

- PC1.** determine the structure and wiring connections of the refrigeration system from technical drawings
- PC2.** check that refrigeration system electrical connections, wiring and piping are properly routed, secured and there are no vibrations and loose ends
- PC3.** check that compressor, fan motors, mounting bolts and brackets are properly tightened
- PC4.** check that condensing unit and evaporator coil are properly fitted and secured
- PC5.** check the level of compressor oil and add as per system requirements
- PC6.** check the liquid line sight glass for proper refrigerant charge
- PC7.** check the cooling tower (for water-cooled condenser) for any refrigerant leakage
- PC8.** report information such as issues, defects and other significant findings to the supervisor

Operate a cold storage or refrigeration system

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

- PC9.** operate the refrigeration system to confirm that the compressor discharge and suction pressures are within permissible limits
- PC10.** check that voltage and amperage at the compressor terminals are as per the system requirements
- PC11.** check that fans on the evaporator coil and condensing unit are operational and rotating appropriately
- PC12.** set the desired value of defrost control/timer clock for ensuring a smooth operation
- PC13.** adjust controls and set storage parameters such as temperature and humidity as required for storing the food in the cold storage room/chamber
- PC14.** monitor the temperature sensors, controllers and record the temperature readings by following organisational procedures

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- PC15.** set the required temperature for pre-cooling as per type of materials (raw materials and processed food) to be stored. Pre-cooling: hydrocooling for small fruits, vacuum cooling for green leafy vegetables, blast-air system for cooling the surfaces of meat products, cooling of milk and other dairy products in specialised tanks, pulsed air in some other products, etc.
- PC16.** operate the refrigeration controls for materials to be stored frozen to ensure increased shelf-life
- PC17.** operate the refrigeration system to super-cool and super-chill the materials as per organisational demands

Storage of food in cold storage room

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

- PC18.** determine the type and quantity of raw materials and processed food to be stored in the cold storage room
- PC19.** check the packaging and quality of food before storing
- PC20.** set the required temperature of the cold room facility for the materials that have been pre-cooled and their sensitivity levels. Sensitivity levels: high-sensitivity products such as mangoes, ginger, sweet potatoes; medium-sensitivity products such as tangerines, green beans, potatoes; low-sensitivity such as eggs, etc.
- PC21.** check the temperature in cold storage room, between the cartons on a pallet and between packages inside a carton to ensure proper air circulation
- PC22.** monitor the temperature and humidity levels of the cold storage room at regular intervals and adjust the controls as required
- PC23.** check the storage food periodically for any decay, mold growth, sprouting, shrivelling, etc. appropriately and take required action against it
- PC24.** unload stored food after it has been stored for the specified duration and examine the quality thoroughly
- PC25.** inspect the quality of food by checking any shrivelling, freezer burns, mold growth, deterioration, etc. in the food
- PC26.** handover the stored materials to the concerned authority as per the organisational procedures
- PC27.** prepare and maintain the records (such as type of food being stored, set temperature of the refrigeration system, time of storage, when to unload materials stored, etc.) as per organisational guidelines
- PC28.** clean the refrigeration system and process auxiliaries as per standard work practice
- PC29.** dispose waste and hazardous materials safely while ensuring no contact with the raw material, processed food, packaging material, etc.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant food storage standards and processes followed in the organisation
- KU2.** organisational reporting and documentation procedure
- KU3.** how to interpret equipment drawing and wiring diagrams
- KU4.** types of refrigeration systems in food processing industry

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- KU5.** various components (such as compressors, condensers, evaporators, coil, etc.) of an installed refrigeration system and its desired functioning
- KU6.** how to operate controls of the refrigeration systems (such as temperature controllers, gauges, etc.)
- KU7.** tools and equipment used for maintenance
- KU8.** parameters to be assessed in installed refrigeration systems and techniques used
- KU9.** steps to be followed to inspect refrigeration system during maintenance
- KU10.** standard checks conducted during maintenance
- KU11.** inspection of stored food materials for identifying possible defects
- KU12.** desirable conditions for storing materials in food processing industry
- KU13.** standard practices followed for monitoring the performance of refrigeration systems
- KU14.** refrigeration processes such as pre-cooling, chilling, freezing, super-cooling and super-chilling
- KU15.** how to check the operating parameters such as temperature, humidity etc. before starting and during the storage of food in refrigeration system
- KU16.** safety hazards and practices associated with the pre-start up inspection and operation tasks
- KU17.** defects observed in refrigeration systems and procedure for resolving them
- KU18.** documents and records need to maintain related to pre-startup check and operations performed
- KU19.** how to clean refrigeration system appropriately safe techniques for waste disposal

Generic Skills (GS)

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

- GS1.** read and interpret drawings, work instructions, equipment manuals and process documents
- GS2.** communicate the maintenance activities requirements to the supervisor and co-workers
- GS3.** record operation and maintenance information related to equipment in English/regional language
- GS4.** recognise a workplace problem and take suitable action
- GS5.** analyse and apply the information gathered from observations, experience, reasoning or communication to act efficiently
- GS6.** plan and organise tools, equipment and consumables for carrying out maintenance job
- GS7.** complete the assigned tasks as per schedule

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Pre-start up checks of refrigeration system</i>	8	10	-	5
PC1. determine the structure and wiring connections of the refrigeration system from technical drawings	1	1	-	1
PC2. check that refrigeration system electrical connections, wiring and piping are properly routed, secured and there are no vibrations and loose ends	1	2	-	1
PC3. check that compressor, fan motors, mounting bolts and brackets are properly tightened	1	2	-	1
PC4. check that condensing unit and evaporator coil are properly fitted and secured	1	1	-	-
PC5. check the level of compressor oil and add as per system requirements	1	1	-	1
PC6. check the liquid line sight glass for proper refrigerant charge	1	1	-	1
PC7. check the cooling tower (for water-cooled condenser) for any refrigerant leakage	1	1	-	-
PC8. report information such as issues, defects and other significant findings to the supervisor	1	1	-	-
<i>Operate a cold storage or refrigeration system</i>	9	16	-	7
PC9. operate the refrigeration system to confirm that the compressor discharge and suction pressures are within permissible limits	1	2	-	1
PC10. check that voltage and amperage at the compressor terminals are as per the system requirements	1	1	-	-
PC11. check that fans on the evaporator coil and condensing unit are operational and rotating appropriately	1	2	-	1
PC12. set the desired value of defrost control/timer clock for ensuring a smooth operation	1	1	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. adjust controls and set storage parameters such as temperature and humidity as required for storing the food in the cold storage room/chamber	1	2	-	1
PC14. monitor the temperature sensors, controllers and record the temperature readings by following organisational procedures	1	2	-	1
PC15. set the required temperature for pre-cooling as per type of materials (raw materials and processed food) to be stored. Pre-cooling: hydrocooling for small fruits, vacuum cooling for green leafy vegetables, blast-air system for cooling the surfaces of meat products, cooling of milk and other dairy products in specialised tanks, pulsed air in some other products, etc.	1	2	-	1
PC16. operate the refrigeration controls for materials to be stored frozen to ensure increased shelf-life	1	2	-	1
PC17. operate the refrigeration system to super-cool and super-chill the materials as per organisational demands	1	2	-	1
<i>Storage of food in cold storage room</i>	13	24	-	8
PC18. determine the type and quantity of raw materials and processed food to be stored in the cold storage room	1	1	-	-
PC19. check the packaging and quality of food before storing	1	1	-	1
PC20. set the required temperature of the cold room facility for the materials that have been pre-cooled and their sensitivity levels. Sensitivity levels: high-sensitivity products such as mangoes, ginger, sweet potatoes; medium-sensitivity products such as tangerines, green beans, potatoes; low-sensitivity such as eggs, etc.	1	3	-	1
PC21. check the temperature in cold storage room, between the cartons on a pallet and between packages inside a carton to ensure proper air circulation	2	3	-	1

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22. monitor the temperature and humidity levels of the cold storage room at regular intervals and adjust the controls as required	1	3	-	1
PC23. check the storage food periodically for any decay, mold growth, sprouting, shrivelling, etc. appropriately and take required action against it	1	4	-	2
PC24. unload stored food after it has been stored for the specified duration and examine the quality thoroughly	1	2	-	-
PC25. inspect the quality of food by checking any shrivelling, freezer burns, mold growth, deterioration, etc. in the food	1	1	-	-
PC26. handover the stored materials to the concerned authority as per the organisational procedures	1	2	-	-
PC27. prepare and maintain the records (such as type of food being stored, set temperature of the refrigeration system, time of storage, when to unload materials stored, etc.) as per organisational guidelines	1	2	-	1
PC28. clean the refrigeration system and process auxiliaries as per standard work practice	1	1	-	1
PC29. dispose waste and hazardous materials safely while ensuring no contact with the raw material, processed food, packaging material, etc.	1	1	-	-
NOS Total	30	50	-	20

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National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9502
NOS Name	Operate refrigeration systems at food processing workplace
Sector	Food Processing
Sub-Sector	Generic
Occupation	Utilities and Maintenance
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	29/07/2021
Next Review Date	29/07/2024
NSQC Clearance Date	29/07/2021

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FIC/N9501: Prepare work area and refrigeration equipment

Description

This NOS is about preparing the refrigeration system in accordance with SOP.

Scope

The scope covers the following :

- Prepare the work area for refrigeration
- Prepare for operation and maintenance of refrigeration system

Elements and Performance Criteria

Prepare the work area for refrigeration

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

- PC1.** inspect the work area to ensure it is free from pests and unwanted materials
- PC2.** clean the work area thoroughly using industry recommended cleaning and sanitising agents

Prepare for operation and maintenance of refrigeration system

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

- PC3.** obtain work instructions from supervisor and process manuals for operation and maintenance of refrigeration system
- PC4.** plan the tasks to be performed effectively
- PC5.** identify the storage requirements of food products being stored in refrigeration systems
- PC6.** identify the tools, gauges and equipment required for operation and maintenance of the refrigeration system
- PC7.** inspect the tools and equipment for probable defects before use
- PC8.** clean the tools and equipment using approved sanitizers and store them appropriately after use
- PC9.** dispose waste and hazardous materials as per organisation's policies safely while ensuring zero contact with raw materials, processed food, packaged materials, etc.
- PC10.** report information such as pest infestations, material requirements, etc. to the supervisor as per organisational practice

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** organisational repair and maintenance standards and processes
- KU2.** various parts of a refrigeration system and cold storage facility
- KU3.** functioning of a refrigeration system
- KU4.** tools, equipment and techniques used to inspect the refrigeration systems for effective functioning

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- KU5.** how to read maintenance schedules and checklists recommended by the equipment manufacturer
- KU6.** how to read equipment layout or drawing and wiring diagrams to understand its structure
- KU7.** how to collect and store consumables, spare parts, tools etc. as per organizational procedures
- KU8.** operation of machinery and equipment being used for the process
- KU9.** Standard Operating Procedures (SOP) recommended by OEM for using tools and equipment required during inspection and repairing
- KU10.** specifications and procedure for checking performance of various components
- KU11.** assembling and dismantling procedure of refrigeration system
- KU12.** how to check refrigerant and oil leakage in the refrigeration system
- KU13.** how to troubleshoot and repair refrigeration system
- KU14.** corrective actions for common faults and failures in refrigeration system
- KU15.** how to conduct trial run of the refrigeration system
- KU16.** how to collect and store consumables, spare parts, tools etc. as per organizational procedures
- KU17.** use of appropriate personal protective equipment (PPE), material handling equipment and tools for completing the maintenance tasks
- KU18.** documentation and records need to maintain regarding repair, maintenance and service performed
- KU19.** methods of disposing waste
- KU20.** importance of supervisor approval for maintenance work done
- KU21.** reporting procedure of an organisation

Generic Skills (GS)

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

- GS1.** read and interpret drawings, work instructions, equipment manuals and process documents
- GS2.** communicate the maintenance activities requirements to the supervisor and co-workers
- GS3.** record operation and maintenance information related to equipment in English/regional language
- GS4.** recognise a workplace problem and take suitable action
- GS5.** analyse and apply the information gathered from observations, experience, reasoning or communication to act efficiently
- GS6.** plan and organise tools, equipment and consumables for carrying out maintenance job
- GS7.** complete the assigned tasks as per schedule

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare the work area for refrigeration</i>	8	16	-	6
PC1. inspect the work area to ensure it is free from pests and unwanted materials	5	10	-	4
PC2. clean the work area thoroughly using industry recommended cleaning and sanitising agents	3	6	-	2
<i>Prepare for operation and maintenance of refrigeration system</i>	22	34	-	14
PC3. obtain work instructions from supervisor and process manuals for operation and maintenance of refrigeration system	3	4	-	1
PC4. plan the tasks to be performed effectively	2	4	-	2
PC5. identify the storage requirements of food products being stored in refrigeration systems	3	6	-	2
PC6. identify the tools, gauges and equipment required for operation and maintenance of the refrigeration system	3	5	-	2
PC7. inspect the tools and equipment for probable defects before use	3	5	-	2
PC8. clean the tools and equipment using approved sanitizers and store them appropriately after use	3	5	-	2
PC9. dispose waste and hazardous materials as per organisation's policies safely while ensuring zero contact with raw materials, processed food, packaged materials, etc.	3	3	-	2
PC10. report information such as pest infestations, material requirements, etc. to the supervisor as per organisational practice	2	2	-	1
NOS Total	30	50	-	20

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National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9501
NOS Name	Prepare work area and refrigeration equipment
Sector	Food Processing
Sub-Sector	Generic
Occupation	Utilities and Maintenance
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	29/07/2021
Next Review Date	29/07/2024
NSQC Clearance Date	29/07/2021

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SGJ/N1702: Optimize resource utilization at workplace

Description

This unit is about adopting sustainable practices and optimizing use of resources, especially material, energy and waste, in day-to-day operations at work

Scope

The scope covers the following :

- Material conservation practices
- Energy/electricity conservation practices
- Effective waste management/recycling practices

Elements and Performance Criteria

Material conservation practices

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

- PC1.** identify ways to optimize usage of material including water in various tasks/activities/processes
- PC2.** check for spills/leakages in various tasks/activities/processes
- PC3.** plug spills/leakages and escalate to appropriate authority if unable to rectify
- PC4.** carry out routine cleaning of tools, machines and equipment

Energy/electricity conservation practices

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

- PC5.** identify ways to optimize usage of electricity/energy in various tasks/activities/processes
- PC6.** check if the equipment/machine is functioning normally before commencing work and rectify wherever required
- PC7.** report malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment
- PC8.** ensure electrical equipment and appliances are properly connected and turned off when not in use

Effective waste management/recycling practices

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

- PC9.** identify recyclable and non-recyclable, and hazardous waste generated
- PC10.** segregate waste into different categories
- PC11.** dispose non-recyclable waste appropriately
- PC12.** deposit recyclable and reusable material at identified location
- PC13.** follow processes specified for disposal of hazardous waste

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

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- KU1.** potential hazards, risks and threats based on the nature of work
- KU2.** layout of the workstation and electrical and thermal equipment used
- KU3.** organizations procedures for minimizing waste
- KU4.** efficient and inefficient utilization of material and water
- KU5.** ways of efficiently managing material and water in the process
- KU6.** basics of electricity and prevalent energy efficient devices
- KU7.** ways to recognize common electrical problems
- KU8.** common practices of conserving electricity
- KU9.** usage of different colours of dustbins
- KU10.** categorization of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics
- KU11.** waste management and methods of waste disposal
- KU12.** common sources of pollution and ways to minimize it

Generic Skills (GS)

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

- GS1.** record data on waste disposal at workplace
- GS2.** complete statutory documents relevant to safety and hygiene
- GS3.** read Standard Operating Practices (SOP) documents
- GS4.** communicate with colleagues on the significance of greening of jobs
- GS5.** make timely decisions for efficient utilization of resources
- GS6.** complete tasks efficiently and accurately within stipulated time
- GS7.** work with supervisors/team members to carry out work related tasks
- GS8.** identify cause and effect of greening of jobs

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Material conservation practices</i>	4	8	-	-
PC1. identify ways to optimize usage of material including water in various tasks/activities/processes	1	2	-	-
PC2. check for spills/leakages in various tasks/activities/processes	1	2	-	-
PC3. plug spills/leakages and escalate to appropriate authority if unable to rectify	1	2	-	-
PC4. carry out routine cleaning of tools, machines and equipment	1	2	-	-
<i>Energy/electricity conservation practices</i>	4	8	-	-
PC5. identify ways to optimize usage of electricity/energy in various tasks/activities/processes	1	2	-	-
PC6. check if the equipment/machine is functioning normally before commencing work and rectify wherever required	1	2	-	-
PC7. report malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment	1	2	-	-
PC8. ensure electrical equipment and appliances are properly connected and turned off when not in use	1	2	-	-
<i>Effective waste management/recycling practices</i>	5	10	-	-
PC9. identify recyclable and non-recyclable, and hazardous waste generated	1	2	-	-
PC10. segregate waste into different categories	1	2	-	-
PC11. dispose non-recyclable waste appropriately	1	2	-	-
PC12. deposit recyclable and reusable material at identified location	1	2	-	-
PC13. follow processes specified for disposal of hazardous waste	1	2	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	13	26	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	SGJ/N1702
NOS Name	Optimize resource utilization at workplace
Sector	Green Jobs
Sub-Sector	Other Green Jobs
Occupation	Resource Optimization
NSQF Level	3
Credits	TBD
Version	1.0
Last Reviewed Date	25/11/2021
Next Review Date	25/11/2024
NSQC Clearance Date	25/11/2021

Qualification Pack

FIC/N9901: Implement health and safety practices at the workplace

Description

This unit is about following health and safety procedures at the workplace.

Scope

The scope covers the following :

- Ensure food safety and personal hygiene
- Follow safety measures to avoid accidents
- Follow emergency procedures
- Manage infection control

Elements and Performance Criteria

Ensure food safety and personal hygiene

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

- PC1.** follow relevant practices to avoid cross contamination at all stages of food processing operations
- PC2.** follow organisational procedures for handling items that may cause allergic reactions
- PC3.** follow Good Manufacturing Practices (GMP) at the workplace. Good Manufacturing Practices: location and layout (ergonomics), cleaning and sanitation, equipment and containers, pest control, facilities (lighting, water supply, drainage and waste disposal, air quality and ventilation), food storage, transportation, and distribution (Source: Schedule IV, FSSAI Licensing and Registration, 2011)
- PC4.** follow Good Hygiene Practices (GHP) at the workplace appropriately. Good Hygiene Practices: use of gloves, hairnets, masks, ear plugs, goggles, shoes etc; washing hands regularly; treating injuries such as cuts, boils, skin infections and grazes; preventive health check-ups ; getting vaccinated whenever required. (Source: Schedule IV, FSSAI Licensing and Registration, 2011)

Follow safety measures to avoid accidents

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

- PC5.** use protective clothing/equipment for specific tasks and work conditions
- PC6.** identify job-site hazardous work and possible causes of risk or accident at the workplace
- PC7.** deal with hazards safely and appropriately to ensure safety of self and others as per organisational protocol
- PC8.** use various types of fire extinguishers effectively
- PC9.** respond promptly and appropriately to an accident situation or medical emergency
- PC10.** provide cardio-pulmonary resuscitation (CPR) as per the requirement (e.g. cardiac arrest)

Follow emergency procedures

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

- PC11.** follow workplace emergency and evacuation procedures
- PC12.** use safe methods to free a person from electrocution

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PC13. administer appropriate first aid to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning etc.

Manage infection control

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

PC14. use appropriate disinfectants to disinfect the work area and equipment as per organisational protocol

PC15. ensure personal hygiene by washing hands regularly using alcohol based sanitisers and wearing personal protective equipment (PPE)

PC16. report illness of self and others to the supervisor or concerned authority

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. meaning of hazards and risks

KU2. possible causes of risk, hazard or accident in the workplace

KU3. where to find all the general health and safety equipment in the workplace

KU4. health and safety policy and procedures of the organization

KU5. health and safety hazards commonly present in the work environment

KU6. work practices and precautions used to control and prevent risks, hazards and accidents

KU7. applicable standards and regulations as listed in The Food Safety and Standards Act, 2006

KU8. importance of each personal protective equipment used such as eye protection, hard hats, gloves apron, rubber boots, etc.

KU9. importance of ensuring personal hygiene at the workplace

KU10. ways to prevent cross contamination at the workplace

KU11. importance of storing food at specified temperatures

KU12. various dangers associated with the use of electrical and other equipment

KU13. preventive and remedial actions to be taken in the case of exposure to toxic materials

KU14. various causes of fire and the ways to prevent them

KU15. techniques of using the different fire extinguishers

KU16. procedure followed for providing cardio-pulmonary resuscitation (CPR) to the affected

KU17. rescue techniques applied during a fire hazard

KU18. various types of safety signs and what they mean

KU19. workplace emergency and evacuation procedures

KU20. appropriate basic first aid treatment relevant to the condition e.g. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries

KU21. potential injuries and ill health conditions associated with incorrect manual handling

KU22. safe lifting and carrying practices

KU23. safe practices to be followed for ensuring sanitisation of self and work area

KU24. procedure for storing the sanitising materials appropriately

Generic Skills (GS)

Qualification Pack

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

- GS1.** write an accident/incident report in local language or English
- GS2.** read and comprehend basic content to read labels, charts, signages, symbols and product manuals
- GS3.** communicate with coworkers appropriately in order to clarify instructions and other issues
- GS4.** make appropriate decisions pertaining to the concerned area of work regarding the work objective, span of authority, responsibility, laid down procedure and guidelines
- GS5.** plan and organize the work schedule, work area, tools, equipment and materials for improved productivity
- GS6.** identify probable solutions to the problems in hand and evaluate them
- GS7.** seek official and authorised sources of help and guidance to resolve problems that cannot be solved at one's level of authority

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Ensure food safety and personal hygiene</i>	7	19	-	-
PC1. follow relevant practices to avoid cross contamination at all stages of food processing operations	1	4	-	-
PC2. follow organisational procedures for handling items that may cause allergic reactions	1	4	-	-
PC3. follow Good Manufacturing Practices (GMP) at the workplace. Good Manufacturing Practices: location and layout (ergonomics), cleaning and sanitation, equipment and containers, pest control, facilities (lighting, water supply, drainage and waste disposal, air quality and ventilation), food storage, transportation, and distribution (Source: Schedule IV, FSSAI Licensing and Registration, 2011)	3	7	-	-
PC4. follow Good Hygiene Practices (GHP) at the workplace appropriately. Good Hygiene Practices: use of gloves, hairnets, masks, ear plugs, goggles, shoes etc; washing hands regularly; treating injuries such as cuts, boils, skin infections and grazes; preventive health check-ups ; getting vaccinated whenever required. (Source: Schedule IV, FSSAI Licensing and Registration, 2011)	2	4	-	-
<i>Follow safety measures to avoid accidents</i>	11	24	-	-
PC5. use protective clothing/equipment for specific tasks and work conditions	2	4	-	-
PC6. identify job-site hazardous work and possible causes of risk or accident at the workplace	2	4	-	-
PC7. deal with hazards safely and appropriately to ensure safety of self and others as per organisational protocol	2	4	-	-
PC8. use various types of fire extinguishers effectively	2	4	-	-
PC9. respond promptly and appropriately to an accident situation or medical emergency	1	4	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. provide cardio-pulmonary resuscitation (CPR) as per the requirement (e.g. cardiac arrest)	2	4	-	-
<i>Follow emergency procedures</i>	6	12	-	-
PC11. follow workplace emergency and evacuation procedures	2	4	-	-
PC12. use safe methods to free a person from electrocution	2	4	-	-
PC13. administer appropriate first aid to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning etc.	2	4	-	-
<i>Manage infection control</i>	6	15	-	-
PC14. use appropriate disinfectants to disinfect the work area and equipment as per organisational protocol	3	7	-	-
PC15. ensure personal hygiene by washing hands regularly using alcohol based sanitisers and wearing personal protective equipment (PPE)	1	4	-	-
PC16. report illness of self and others to the supervisor or concerned authority	2	4	-	-
NOS Total	30	70	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9901
NOS Name	Implement health and safety practices at the workplace
Sector	Food Processing
Sub-Sector	Generic
Occupation	Generic
NSQF Level	3
Credits	TBD
Version	1.0
Last Reviewed Date	25/11/2021
Next Review Date	25/11/2024
NSQC Clearance Date	25/11/2021

Qualification Pack

FIC/N9902: Work effectively in an organisation

Description

This unit is about working effectively with others.

Scope

The scope covers the following :

- Communicate effectively
- Work in a team effectively
- Respect diversity

Elements and Performance Criteria

Communicate effectively

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

- PC1.** obtain complete information and instructions from designated personnel
- PC2.** reciprocate understanding and seek clarifications whenever required
- PC3.** provide information accurately and clearly
- PC4.** use inclusive language (verbal, non-verbal and written) that is gender, disability and culturally sensitive

Work in a team effectively

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

- PC5.** plan tasks to be performed as per priority and need
- PC6.** consult with and assist others to maximize effectiveness and efficiency at work
- PC7.** escalate problems and grievances beyond own scope to the concerned authority
- PC8.** take appropriate action to resolve conflicts at the workplace

Respect diversity

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

- PC9.** maintain a gender-neutral behaviour with everyone at the workplace
- PC10.** empathise with People with Disabilities (PwD) and offer help, if required
- PC11.** recognise and report incidents of harassment and discrimination to appropriate authority

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** organizational quality procedures and processes associated with work
- KU2.** standards, policies, and procedures followed in the organization relevant to employment, harassment, discrimination and performance conditions
- KU3.** reporting structure, inter-dependent functions, lines, and procedures applicable at the workplace

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- KU4.** different types of harassment and discrimination based on gender, disability, caste, religion, and culture
- KU5.** components of effective communication and its importance
- KU6.** importance of teamwork in organizational and individual success
- KU7.** importance of ethics and discipline for professional success
- KU8.** how to express and address grievances appropriately and effectively
- KU9.** importance and ways of managing interpersonal conflict effectively
- KU10.** different types of disabilities and the challenges faced by persons with disability (PwD)
- KU11.** laws, acts and provisions defined for PwD
- KU12.** importance of gender sensitivity and equality
- KU13.** legislations, grievance redressal mechanisms, and penalties against harassment in the workplace

Generic Skills (GS)

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

- GS1.** communicate information, doubts and concerns about work related matters in local language or Hindi/English
- GS2.** read and interpret information given in local language or Hindi/English
- GS3.** establish priorities and deadlines in consultation with other and record them
- GS4.** be punctual
- GS5.** listen to others concerns and doubts carefully and address them
- GS6.** be courteous

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Communicate effectively</i>	8	13	-	-
PC1. obtain complete information and instructions from designated personnel	2	3	-	-
PC2. reciprocate understanding and seek clarifications whenever required	2	3	-	-
PC3. provide information accurately and clearly	2	3	-	-
PC4. use inclusive language (verbal, non-verbal and written) that is gender, disability and culturally sensitive	2	4	-	-
<i>Work in a team effectively</i>	8	14	-	-
PC5. plan tasks to be performed as per priority and need	2	4	-	-
PC6. consult with and assist others to maximize effectiveness and efficiency at work	2	3	-	-
PC7. escalate problems and grievances beyond own scope to the concerned authority	2	3	-	-
PC8. take appropriate action to resolve conflicts at the workplace	2	4	-	-
<i>Respect diversity</i>	6	12	-	-
PC9. maintain a gender-neutral behaviour with everyone at the workplace	2	4	-	-
PC10. empathise with People with Disabilities (PwD) and offer help, if required	2	4	-	-
PC11. recognise and report incidents of harassment and discrimination to appropriate authority	2	4	-	-
NOS Total	22	39	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9902
NOS Name	Work effectively in an organisation
Sector	Food Processing
Sub-Sector	Generic
Occupation	Generic
NSQF Level	3
Credits	TBD
Version	1.0
Last Reviewed Date	25/11/2021
Next Review Date	25/11/2024
NSQC Clearance Date	25/11/2021

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) 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. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.
6. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

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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
FIC/N9503.Prepare for the operation and maintenance of a refrigeration system in a food processing workplace	19	28	-	14	61	15
FIC/N9502.Operate refrigeration systems at food processing workplace	30	50	-	20	100	25
FIC/N9501.Carry out preventive maintenance of refrigeration system at food processing workplace	30	50	-	20	100	30
SGJ/N1702.Optimize resource utilization at workplace	13	26	-	-	39	10
FIC/N9901.Implement health and safety practices at the workplace	30	70	-	-	100	10
FIC/N9902.Work effectively in an organisation	22	39	-	-	61	10
Total	144	263	-	54	461	100

Qualification Pack

Acronyms

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

Qualification Pack

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.

Qualification Pack

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.
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 Standard	NOS are occupational standards which apply uniquely in the Indian context.
Qualification 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.

Qualification Pack

Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by '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	Knowledge and Understanding (KU) are statements that 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 or Generic Skills	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 and work environment. In the context of the OS, these include communication-related skills that are applicable to most job roles.