



IT - ITeS SSC
NASSCOM



Qualification Pack



IoT - Network Specialist

QP Code: SSC/Q8208

Version: 3.0

NSQF Level: 6

IT-ITeS Sector Skill Council || NASSCOM Plot No - 7, 8, 9 & 10, 3rd Floor, Sector 126
Noida Uttar Pradesh - 201303

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SSC/Q8208: IoT - Network Specialist

Brief Job Description

Individuals at this job are responsible for the design of network architecture for end-to-end IoT solutions and for the maintenance, management, monitoring, and troubleshooting of networks.

Personal Attributes

IoT Network Specialists must be able to communicate effectively. They must possess strong interpersonal skills. He/she must have a zeal to learn new things.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [SSC/N9014: Maintain an inclusive, environmentally sustainable workplace](#)
2. [SSC/N8228: Design network architecture considering capacity, reliability and security requirements](#)
3. [SSC/N8229: Maintain, manage, monitor, and troubleshoot IoT network](#)
4. [SSC/N8238: Create technical documents and manuals](#)
5. [DGT/VSQ/N0102: Employability Skills \(60 Hours\)](#)
6. [SSC/N8227: Design network architecture for end-to-end IoT solutions](#)

Qualification Pack (QP) Parameters

Sector	IT-ITeS
Sub-Sector	Future Skills
Occupation	Internet of Things
Country	India
NSQF Level	6
Credits	19
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2523



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Minimum Educational Qualification & Experience	Pursuing first year of 2-year PG program after completing 3 year UG degree OR Completed 4 year UG program (in case of 4-year UG with honours/ honours with research) OR Previous relevant Qualification of NSQF Level (NSQF Level 5) with 3 Years of experience relevant experience in relevant field
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	22 Years
Last Reviewed On	NA
Next Review Date	25/08/2025
NSQC Approval Date	25/08/2022
Version	3.0
Reference code on NQR	QG-06-IT-00500-2023-V1.1-NASSCOM
NQR Version	3

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SSC/N9014: Maintain an inclusive, environmentally sustainable workplace

Description

The unit is about implementing and improving diversity equality and inclusion in a sustainable and environment friendly workplace.

Scope

The scope covers the following :

- Sustainable Practices
- Respect diversity and strengthen practices to promote equity (equality)/inclusivity

Elements and Performance Criteria

Sustainable Practices

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

- PC1.** optimize usage of electricity/energy, materials, and water in various asks / activities / processes and plan the implementation of energy efficient systems in a phased manner
- PC2.** segregate recyclable, non-recyclable and hazardous waste generated for disposal or efficient waste management

Respect diversity and strengthen practices to promote equity (equality)/inclusivity

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

- PC3.** understand the diversity policy of the organization and use internal & external communication to colleagues to improve
- PC4.** comply with PwD inclusive policies for an adaptable and equitable work environment
- PC5.** improve through specifically designed recruitment practices, PwD friendly infrastructure, job roles, etc.
- PC6.** use and advocate for appropriate verbal/nonverbal communication, schemes and benefits of PwD.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** the organization's policies and procedures about gender inclusivity, equality and sustainability while working with colleagues and your role and responsibilities in relation to this
- KU2.** inclusive tools and practices of communication to acknowledge/validate, share and promote the cause of gender parity at workplace. For example - supporting women with mentorship programs, speaking out against discriminatory practices or harassment
- KU3.** the concept of gender, gender equality and gender discrimination, and all forms of gender discrimination, violence and inequality, including the current and historical causes of gender inequality in the workplace



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- KU4.** how to maintain and provide a conducive work environment that is free from any harassment. facilities and amenities to PwD to perform and excel in their role
- KU5.** organization's redressal mechanisms (like the POSH committee) to address harassment and bias at the workplace, with awareness of prevalent legislations against bias and sexual harassment
- KU6.** initiatives towards efficient use of natural resources and energy, reduction and prevention of pollution and promoting waste avoidance and recycling measures in line with internationally disseminated technologies and practices
- KU7.** all about various energy options including renewable and non-renewable with their environmental impacts, health issues, usage, safety and energy security
- KU8.** implications that any non-compliance with electricity and energy may have on individuals and the organization
- KU9.** the organization's electricity first aid emergency procedures
- KU10.** how to monitor, measure and report performance of environmental conservation
- KU11.** different types of electricity accidents, safety and security and how and when to report these
- KU12.** how to use the electricity/energy safety, accident reporting, emergency procedures and the importance of these

Generic Skills (GS)

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

- GS1.** read PwD instructions, guidelines, procedures, diversity policies/acts, rules and service level agreements
- GS2.** be aware of one's own gender identity and gender role and respectful of the gender performances of others
- GS3.** organize team building or sensitization workshops to address gender biases, stereotypes and potentially blind spots
- GS4.** clarify personal norms and values related to energy production and usage as well as to reflect and evaluate their own energy usage in terms of efficiency and sufficiency
- GS5.** listen and communicate (oral) effectively and accurately on all PwD policies
- GS6.** apply balanced judgments in gender diversity situations
- GS7.** take action to reduce the carbon footprint of business activities and embed environmental responsibility
- GS8.** calibration session with employees to discuss gender biases, stereotypes and potentially blind spots

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Sustainable Practices</i>	10	30	-	-
PC1. optimize usage of electricity/energy, materials, and water in various asks / activities / processes and plan the implementation of energy efficient systems in a phased manner	5	15	-	-
PC2. segregate recyclable, non-recyclable and hazardous waste generated for disposal or efficient waste management	5	15	-	-
<i>Respect diversity and strengthen practices to promote equity (equality)/inclusivity</i>	10	50	-	-
PC3. understand the diversity policy of the organization and use internal & external communication to colleagues to improve	5	10	-	-
PC4. comply with PwD inclusive policies for an adaptable and equitable work environment	-	10	-	-
PC5. improve through specifically designed recruitment practices, PwD friendly infrastructure, job roles, etc.	-	20	-	-
PC6. use and advocate for appropriate verbal/nonverbal communication, schemes and benefits of PwD.	5	10	-	-
NOS Total	20	80	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	SSC/N9014
NOS Name	Maintain an inclusive, environmentally sustainable workplace
Sector	IT-ITeS
Sub-Sector	IT Services, Business Process Management, Engineering R&D, Software Product Development, Future Skills
Occupation	Generic,
NSQF Level	5
Credits	1
Version	1.0
Last Reviewed Date	27/01/2022
Next Review Date	28/04/2025
NSQC Clearance Date	28/04/2022

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SSC/N8228: Design network architecture considering capacity, reliability and security requirements

Description

This unit is about the various considerations that need to be taken into account while building network.

Scope

The scope covers the following :

- Ensure network capacity, coverage and reliability
- Ensure network security
- Manage network deployment

Elements and Performance Criteria

Ensure network capacity, coverage and reliability

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

- PC1.** ensure the network is built in line with coverage requirements
- PC2.** ensure the network is built in line with capacity requirements
- PC3.** ensure high availability of network
- PC4.** ensure scalability of the network to accommodate additional devices
- PC5.** ensure network compatibility where low-powered devices are in use
- PC6.** evaluate power consumption patterns while building the network
- PC7.** ensure that the network offers reliable connectivity

Ensure network security

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

- PC8.** ensure physical security of the network
- PC9.** protect the network from unauthorized access or malicious intent
- PC10.** ensure only authorized devices should be able to connect to the network

Manage network deployment

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

- PC11.** manage the provisioning and connectivity of devices
- PC12.** plan physical placement of network components
- PC13.** apply policies on appropriate network devices to enable communications

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** organizational policies, procedures, and guidelines that relate to designing and maintaining networks



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- KU2.** organizational policies and procedures for sharing data
- KU3.** organizational policies and procedures for documenting network designs and fallback mechanisms
- KU4.** who to involve while designing and developing networks for the solution
- KU5.** the range of standard templates and tools available and how to use them
- KU6.** the connectivity protocols for device-cloud communications (this may include protocols such as 5G, Wi-Fi, GSM, GPRS, and Satellite)
- KU7.** the wired/wireless connectivity protocols for device-device or device-gateway communications (this may include protocols such as NFC, NB-IoT, Bluetooth/BLE, ZigBee, Mesh, and Lora)
- KU8.** the network management dashboards and applications (such as HP Open View)
- KU9.** the network topologies, wired and wireless technologies, fiber optics, etc.
- KU10.** the updated internal and external network regulations
- KU11.** the required network requirements
- KU12.** how to ensure the security of network

Generic Skills (GS)

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

- GS1.** follow instructions, guidelines, procedures, rules, and service level agreements
- GS2.** listen effectively and communicate information accurately
- GS3.** follow rule-based decision-making processes
- GS4.** make decisions on suitable courses
- GS5.** plan and organize the work to achieve targets and meet deadlines
- GS6.** apply problem-solving approaches to different situations
- GS7.** analyze the business impact and disseminate relevant information to others
- GS8.** apply balanced judgments to different situations
- GS9.** check the work is complete and free from errors

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Ensure network capacity, coverage and reliability</i>	19	46	-	-
PC1. ensure the network is built in line with coverage requirements	3	7	-	-
PC2. ensure the network is built in line with capacity requirements	3	7	-	-
PC3. ensure high availability of network	3	7	-	-
PC4. ensure scalability of the network to accommodate additional devices	3	7	-	-
PC5. ensure network compatibility where low-powered devices are in use	1	4	-	-
PC6. evaluate power consumption patterns while building the network	3	7	-	-
PC7. ensure that the network offers reliable connectivity	3	7	-	-
<i>Ensure network security</i>	7	13	-	-
PC8. ensure physical security of the network	2	3	-	-
PC9. protect the network from unauthorized access or malicious intent	2	3	-	-
PC10. ensure only authorized devices should be able to connect to the network	3	7	-	-
<i>Manage network deployment</i>	4	11	-	-
PC11. manage the provisioning and connectivity of devices	1	4	-	-
PC12. plan physical placement of network components	1	4	-	-
PC13. apply policies on appropriate network devices to enable communications	2	3	-	-
NOS Total	30	70	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	SSC/N8228
NOS Name	Design network architecture considering capacity, reliability and security requirements
Sector	IT-ITeS
Sub-Sector	Future Skills
Occupation	Internet of Things
NSQF Level	6
Credits	TBD
Version	2.0
Last Reviewed Date	23/06/2021
Next Review Date	03/05/2026
NSQC Clearance Date	03/05/2023

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SSC/N8229: Maintain, manage, monitor, and troubleshoot IoT network

Description

This unit is about performing various network assessments and troubleshooting identified issues.

Scope

The scope covers the following :

- Perform network assessment
- Carry out troubleshooting activities

Elements and Performance Criteria

Perform network assessment

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

- PC1.** perform on-site surveys and tests on the IoT network
- PC2.** detect sources of network interference
- PC3.** eliminate the impact of network interference
- PC4.** identify areas of dense users
- PC5.** continuously monitor bandwidth consumption of the IoT network
- PC6.** identify applications which consume high bandwidth
- PC7.** identify methods to minimize bandwidth consumption
- PC8.** collect network usage and traffic statistics
- PC9.** monitor system logs of the IoT network

Carry out troubleshooting activities

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

- PC10.** diagnose and resolve network configuration and connectivity issues
- PC11.** identify network blind spots
- PC12.** perform detailed troubleshooting and analysis of IoT networks and endpoints

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** organizational policies, procedures, and guidelines that relate to designing and maintaining networks
- KU2.** organizational policies and procedures for sharing data
- KU3.** organizational policies and procedures for documenting network designs and fallback mechanisms
- KU4.** who to involve while monitoring and troubleshooting the network
- KU5.** the range of standard templates and tools available and how to use them



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- KU6.** the connectivity protocols for device-cloud communications (this may include protocols such as 5G, Wi-Fi, GSM, GPRS, and Satellite)
- KU7.** the wired/wireless connectivity protocols for device-device or device-gateway communications (this may include protocols such as NFC, NB-IoT, Bluetooth/BLE, ZigBee, Mesh, and Lora)
- KU8.** the network management dashboards and applications (such as HP Open View)
- KU9.** the network topologies, wired and wireless technologies, fiber optics, etc.
- KU10.** the updated internal and external network regulations
- KU11.** how to perform network assessments
- KU12.** how to diagnose and resolve network issues
- KU13.** how to identify network blind spots

Generic Skills (GS)

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

- GS1.** follow instructions, guidelines, procedures, rules, and service level agreements
- GS2.** listen effectively and communicate information accurately
- GS3.** follow rule-based decision-making processes
- GS4.** make decisions on suitable courses
- GS5.** plan and organize the work to achieve targets and meet deadlines
- GS6.** refer anomalies to the supervisor
- GS7.** ask for clarification and advice from appropriate people
- GS8.** analyze the business impact and disseminate relevant information to others
- GS9.** apply balanced judgments to different situations
- GS10.** check the work is complete and free from errors
- GS11.** work independently and collaboratively

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Perform network assessment</i>	22	48	-	-
PC1. perform on-site surveys and tests on the IoT network	3	7	-	-
PC2. detect sources of network interference	3	7	-	-
PC3. eliminate the impact of network interference	3	7	-	-
PC4. identify areas of dense users	3	7	-	-
PC5. continuously monitor bandwidth consumption of the IoT network	2	3	-	-
PC6. identify applications which consume high bandwidth	2	3	-	-
PC7. identify methods to minimize bandwidth consumption	2	3	-	-
PC8. collect network usage and traffic statistics	1	4	-	-
PC9. monitor system logs of the IoT network	3	7	-	-
<i>Carry out troubleshooting activities</i>	9	21	-	-
PC10. diagnose and resolve network configuration and connectivity issues	3	7	-	-
PC11. identify network blind spots	3	7	-	-
PC12. perform detailed troubleshooting and analysis of IoT networks and endpoints	3	7	-	-
NOS Total	31	69	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	SSC/N8229
NOS Name	Maintain, manage, monitor, and troubleshoot IoT network
Sector	IT-ITeS
Sub-Sector	Future Skills
Occupation	Internet of Things
NSQF Level	6
Credits	TBD
Version	2.0
Last Reviewed Date	23/06/2021
Next Review Date	03/05/2026
NSQF Clearance Date	03/05/2023

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SSC/N8238: Create technical documents and manuals

Description

This unit is about creating various types of technical documents and manuals including online configuration manuals, user helps, solution information, installation guides, etc.

Scope

The scope covers the following :

- Plan the documentation process
- Develop drafts for the document
- Publish the document

Elements and Performance Criteria

Plan the documentation process

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

- PC1.** identify the purpose and the scope of the activity for which technical documentation is to be produced
- PC2.** obtain information for the technical document from relevant sources and stakeholders

Develop drafts for the document

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

- PC3.** draft technical document ensuring that content is concise, complete, and easy to consume
- PC4.** review technical document content with relevant stakeholders and document owners
- PC5.** ensure that technical document is formatted and designed as per specifications

Publish the document

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

- PC6.** transfer technical document to relevant stakeholders for sign-off and publishing
- PC7.** continuously review and update technical document

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** organizational policies, procedures, and guidelines that relate to drafting and publishing technical documentation
- KU2.** organizational policies and procedures for sharing data
- KU3.** the range of standard templates and tools available and how to use them
- KU4.** the solution for which documentation is to be created
- KU5.** how to create clear and concise content
- KU6.** how to format and align document

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Generic Skills (GS)

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

- GS1.** follow instructions, guidelines, procedures, rules, and service level agreements
- GS2.** listen effectively and communicate information accurately
- GS3.** follow rule-based decision-making processes
- GS4.** make decisions on suitable courses
- GS5.** plan and organize the work to achieve targets and meet deadlines
- GS6.** refer anomalies to the supervisor
- GS7.** apply problem-solving approaches to different situations
- GS8.** analyze the business impact and disseminate relevant information to others
- GS9.** apply balanced judgments to different situations
- GS10.** check the work is complete and free from errors

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Plan the documentation process</i>	11	24	-	-
PC1. identify the purpose and the scope of the activity for which technical documentation is to be produced	6	14	-	-
PC2. obtain information for the technical document from relevant sources and stakeholders	5	10	-	-
<i>Develop drafts for the document</i>	11	24	-	-
PC3. draft technical document ensuring that content is concise, complete, and easy to consume	5	10	-	-
PC4. review technical document content with relevant stakeholders and document owners	3	7	-	-
PC5. ensure that technical document is formatted and designed as per specifications	3	7	-	-
<i>Publish the document</i>	9	21	-	-
PC6. transfer technical document to relevant stakeholders for sign-off and publishing	3	7	-	-
PC7. continuously review and update technical document	6	14	-	-
NOS Total	31	69	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	SSC/N8238
NOS Name	Create technical documents and manuals
Sector	IT-ITeS
Sub-Sector	Future Skills
Occupation	Internet of Things
NSQF Level	5
Credits	TBD
Version	2.0
Last Reviewed Date	23/06/2021
Next Review Date	03/05/2026
NSQF Clearance Date	03/05/2023

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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:



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- 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.

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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

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- 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

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Introduction to Employability Skills</i>	1	1	-	-
PC1. identify employability skills required for jobs in various industries	-	-	-	-
PC2. identify and explore learning and employability portals	-	-	-	-
<i>Constitutional values - Citizenship</i>	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	-	-	-	-
<i>Becoming a Professional in the 21st Century</i>	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	-	-	-	-
<i>Basic English Skills</i>	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	-	-	-	-
<i>Career Development & Goal Setting</i>	1	2	-	-



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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	-	-	-	-
<i>Communication Skills</i>	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	-	-	-	-
<i>Diversity & Inclusion</i>	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	-	-	-	-
<i>Financial and Legal Literacy</i>	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	-	-	-	-
<i>Essential Digital Skills</i>	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	-	-	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Entrepreneurship</i>	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	-	-	-	-
<i>Customer Service</i>	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	-	-	-	-
<i>Getting ready for apprenticeship & Jobs</i>	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	-	-

Qualification Pack

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	23/06/2023
Next Review Date	23/06/2026
NSQC Clearance Date	23/06/2023

Qualification Pack

SSC/N8227: Design network architecture for end-to-end IoT solutions

Description

This unit is about designing networks and network dashboards while taking various considerations, regulations, and interoperability requirements into account.

Scope

The scope covers the following :

- Capture the problem statement
- Define various parameters of network design
- Evaluate regulations
- Design network dashboards

Elements and Performance Criteria

Capture the problem statement

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

- PC1.** evaluate requirements of the IoT network
- PC2.** identify the devices and systems to be connected by the IoT network
- PC3.** identify appropriate technology, devices, and deployment model to best meet the overall needs of the IoT network

Define various parameters of network design

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

- PC4.** design wireless/wired network nodes while taking into consideration the varieties of IoT Clients, Edge devices, Cloud Service/IoT Broker, and other networking devices
- PC5.** apply appropriate wired/wireless connectivity protocols for device-cloud communications (this many include protocols such as 5G, Wi-Fi, GSM, GPRS and Satellite)
- PC6.** evaluate impacts of IoT network on the environment and on human health
- PC7.** build interoperable networks where end-to-end communication is possible across diverse components
- PC8.** ensure network supports bulk configuration functionalities across multiple solution components
- PC9.** design fallback mechanisms in case of network disruptions and outages
- PC10.** address network redundancy considerations

Evaluate regulations

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

- PC11.** evaluate regulatory aspects of building network such as permitted frequency bands

Design network dashboards

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

- PC12.** design and develop networking dashboards used for network monitoring

Qualification Pack

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** organizational policies, procedures, and guidelines that relate to designing and maintaining networks
- KU2.** organizational policies and procedures for sharing data
- KU3.** organizational policies and procedures for documenting network designs and fallback mechanisms
- KU4.** who to involve while designing and developing networks for the solution
- KU5.** the range of standard templates and tools available and how to use them
- KU6.** the connectivity protocols for device-cloud communications (this may include protocols such as 5G, Wi-Fi, GSM, GPRS, and Satellite)
- KU7.** the wired/wireless connectivity protocols for device-device or device-gateway communications (this may include protocols such as NFC, NB-IoT, Bluetooth/BLE, ZigBee, Mesh, and Lora)
- KU8.** the network management dashboards and applications (such as HP Open View)
- KU9.** the network topologies, wired and wireless technologies, fiber optics, etc.
- KU10.** the updated internal and external network regulations
- KU11.** the impacts of network on the environment and human health

Generic Skills (GS)

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

- GS1.** follow instructions, guidelines, procedures, rules, and service level agreements
- GS2.** listen effectively and communicate information accurately
- GS3.** follow rule-based decision-making processes
- GS4.** make decisions on suitable courses
- GS5.** plan and organize the work to achieve targets and meet deadlines
- GS6.** apply problem-solving approaches to different situations
- GS7.** analyze the business impact and disseminate relevant information to others
- GS8.** apply balanced judgments to different situations
- GS9.** check the work is complete and free from errors

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Capture the problem statement</i>	9	21	-	-
PC1. evaluate requirements of the IoT network	3	7	-	-
PC2. identify the devices and systems to be connected by the IoT network	3	7	-	-
PC3. identify appropriate technology, devices, and deployment model to best meet the overall needs of the IoT network	3	7	-	-
<i>Define various parameters of network design</i>	18	42	-	-
PC4. design wireless/wired network nodes while taking into consideration the varieties of IoT Clients, Edge devices, Cloud Service/IoT Broker, and other networking devices	3	7	-	-
PC5. apply appropriate wired/wireless connectivity protocols for device-cloud communications (this many include protocols such as 5G, Wi-Fi, GSM, GPRS and Satellite)	3	7	-	-
PC6. evaluate impacts of IoT network on the environment and on human health	5	10	-	-
PC7. build interoperable networks where end-to-end communication is possible across diverse components	1	4	-	-
PC8. ensure network supports bulk configuration functionalities across multiple solution components	1	4	-	-
PC9. design fallback mechanisms in case of network disruptions and outages	3	7	-	-
PC10. address network redundancy considerations	2	3	-	-
<i>Evaluate regulations</i>	2	3	-	-
PC11. evaluate regulatory aspects of building network such as permitted frequency bands	2	3	-	-



IT - ITeS SSC
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Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Design network dashboards</i>	1	4	-	-
PC12. design and develop networking dashboards used for network monitoring	1	4	-	-
NOS Total	30	70	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	SSC/N8227
NOS Name	Design network architecture for end-to-end IoT solutions
Sector	IT-ITeS
Sub-Sector	Future Skills
Occupation	Internet of Things
NSQF Level	6
Credits	TBD
Version	3.0
Last Reviewed Date	NA
Next Review Date	03/05/2026
NSQC Clearance Date	03/05/2023

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) will be assigned marks proportional to its importance in NOS. SSC will also lay down the proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on the 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 the theory part for each candidate at each examination/training center (as per the 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 a QP, a trainee should score an average of 70% or more
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

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
SSC/N9014.Maintain an inclusive, environmentally sustainable workplace	20	80	-	-	100	10
SSC/N8228.Design network architecture considering capacity, reliability and security requirements	30	70	-	-	100	20
SSC/N8229.Maintain, manage, monitor, and troubleshoot IoT network	31	69	-	-	100	20
SSC/N8238.Create technical documents and manuals	31	69	0	0	100	20
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	0	0	50	10
SSC/N8227.Design network architecture for end-to-end IoT solutions	30	70	-	-	100	20
Total	162	388	-	-	550	100

Qualification Pack

Acronyms

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

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.



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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.