

CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE

Name and address of submitting body:

Telecom Sector Skill Council

Estel House, 3rd Floor, Plot No: - 126, Sector 44, Gurugram, Haryana 122003

Name and contact details of individual dealing with the submission

Name: Mr. Krishna Nand Jha

Position in the organisation: Assistant General Manager

Address if different from above: Same as above

Tel number(s): 0124-4148029

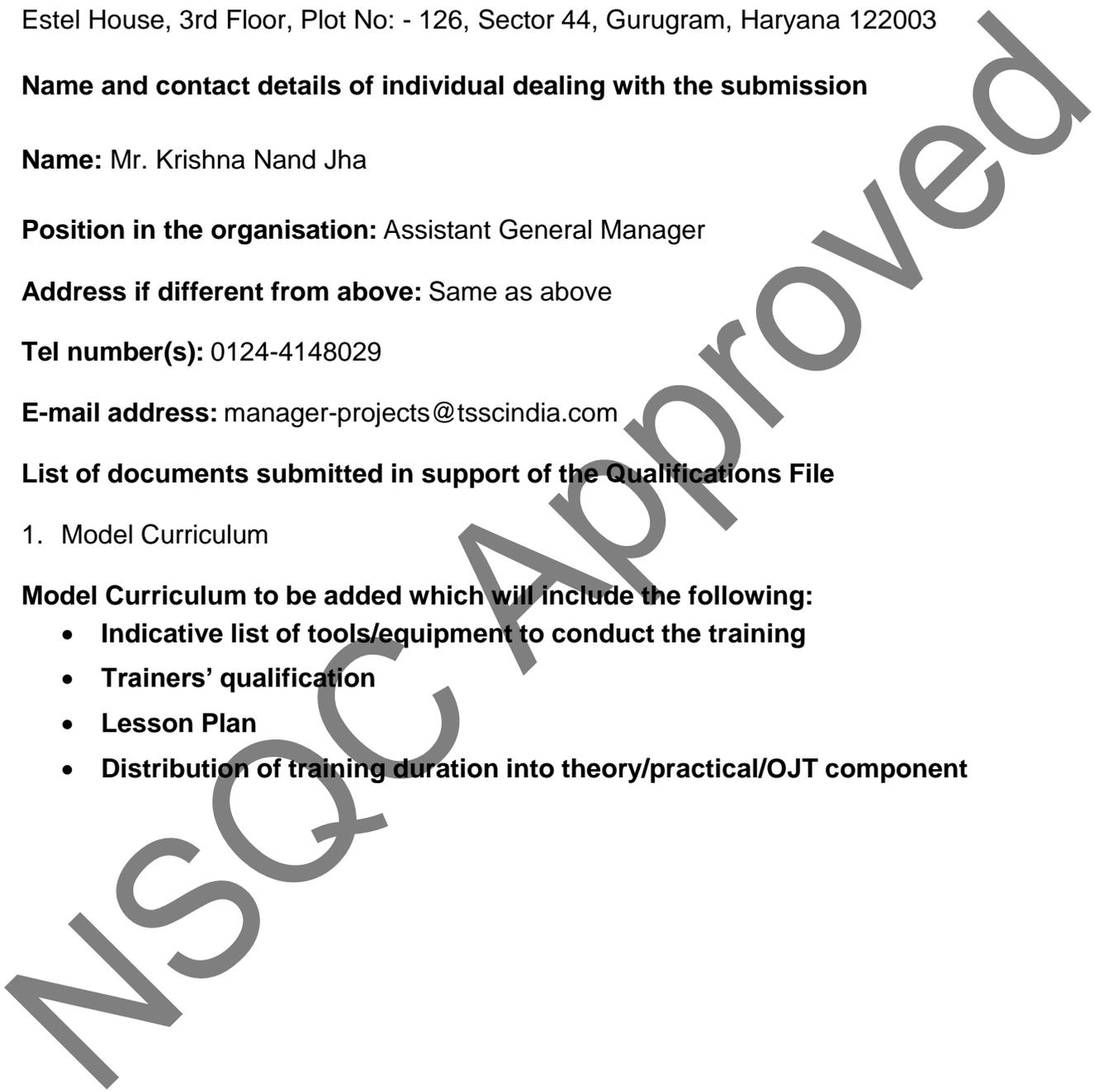
E-mail address: manager-projects@tsscindia.com

List of documents submitted in support of the Qualifications File

1. Model Curriculum

Model Curriculum to be added which will include the following:

- Indicative list of tools/equipment to conduct the training
- Trainers' qualification
- Lesson Plan
- Distribution of training duration into theory/practical/OJT component



NSQF QUALIFICATION FILE

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SUMMARY

1	Qualification Title: IoT Technical Service Operator
2	Qualification Code, if any: TEL/Q6214
3	NCO code and occupation: NCO-2015/3114.6214 Network Operation and Maintenance
4	Nature and purpose of the qualification (Please specify whether a qualification is short term or long term): IoT Technical Service Operator Responsible for providing technical support concerning the Internet of Things (IoT) system including diagnosing and rectifying faults in them. This QP is for a short-term program, and it is designed based on industry demand.
5	Body/bodies which will award the qualification: Telecom Sector Skill Council
6	Body which will accredit providers to offer courses leading to the qualification: Telecom Sector Skill Council
7	Whether accreditation/affiliation norms are already in place or not, if applicable (if yes, attach a copy): Yes. SMART norms for accreditation and SSC norms for affiliation are available on the SMART portal.
8	Occupation(s) to which the qualification gives access: Network Operation and Maintenance
9	Job description of the occupation: An IoT Technical Service Operator is responsible for providing technical support concerning the Internet of Things (IoT) systems, including diagnosing and rectifying faults in them. The individual attends to the client queries and provides appropriate solutions following the organisational standards.
10	Licensing requirements: N/A
11	Statutory and Regulatory requirement of the relevant sector (documentary evidence to be provided): N/A
12	Level of the qualification in the NSQF: Level 3
13	Anticipated volume of training/learning required to complete the qualification: Min. Duration - 450 Hours (Theory - 90, Practical - 150, OJT - 120, Elective - 90) Max Duration - 720 Hours (Theory - 90, Practical - 150, OJT - 120, Elective - 360) 4 Elective NOS: 360 Hours (90 hours each)

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	<p>a. IoT – Smart City – 90 Hours</p> <p>b. IoT – Agriculture – 90 Hours</p> <p>c. IoT – Telemedicine – 90 Hours</p> <p>d. IoT – Transport – 90 Hours</p>
14	<p>Indicative list of training tools required to deliver this qualification:</p> <p>IoT Technical Service Operator:</p> <p>IP Network Speed Tester, IP Scanner, Integrated Circuit, Laptop /Desktop with pre-installed (Python, SQL Server, Java, C++) languages/ Software, RF Transceiver, Microcontroller Unit, RF Switches, Bluetooth IoT Tracking Device, iOS embeddable Component, Relevant stationery, First Aid Kit and Equipment used in Medical Emergencies, Personal Protective Equipment, Hygiene Equipment and Materials like Sanitizer, Soap, Mask.</p> <p>IoT - Smart City: Sensor-Based Automated Lights, CCTV Cameras, Smart Meters, Air Quality Monitor Sensors</p> <p>IoT – Agriculture: Weather Sensors, GPS Receiver, GIS (Geographic Information System) based Sensors</p> <p>IoT – Telemedicine: Wearables Bio-Sensors, Smart Bed, IoT Devices Like Monitoring Chair, Health Chart Screens, Sensor-based Medical Devices – Blood Pressure Monitoring Devices, Heart-rate Monitoring Devices</p> <p>IoT – Transport: Radio Frequency Identification (RFID) Tags, RFID Reader, Sensors and Actuators to control Vehicle functions, Data Monitoring Devices</p>
15	<p>Entry requirements and/or recommendations and minimum age:</p> <p>Class 10th Pass OR Class 8th Pass and pursuing continuous regular schooling OR Class 8th Pass + ITI (2 years in Electronics/Telecom/IT and other relevant fields)</p> <p>15 years</p>
16	<p>Progression from the qualification (Please show Professional and academic progression): Level-4 (Vertical) Telecom Technician - IoT Devices/System</p>
17	<p>Arrangements for the Recognition of Prior learning (RPL):</p> <p>RPL will be based on the same approved Qualification Pack and Assessment Criteria mentioned in the Qualification Pack by Telecom Sector Skill Council.</p>
18	<p>International comparability where known (research evidence to be provided): No</p>
19	<p>Date of a planned review of the qualification: 30 June 2025</p>

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20	The formal structure of the qualification				
	Mandatory components				
(i)	Title of component and identification code/NOSs/Learning outcomes	Estimated size (learning hours)			Level
		Theory	Practical	OJT	
1	Bridge Module (Introduction to the role of an IoT Technical Service Operator)	08	04	20	
2	Carry out Troubleshooting for IoT Devices and Connectivity Issues	30	50	50	3
3	Assist in Providing IoT Solutions to Clients	20	48	50	3
4	Organise Work and Resources as per Health and Safety Standards	16	24	00	4
5	Interact Effectively with Team Members and Customers	16	24	00	4
	Sub Total (A)	90	150	120	
Elective NOS					
	Title of component and identification code/NOSs/Learning outcomes	Estimated size (learning hours)			Level
		Theory	Practical	OJT	
6	IoT – Smart City: Assist in Creating Smart Cities by Implementing Internet of Things (IoT) Solutions	30	30	30	3
7	IoT – Agriculture: Use Internet of Things (IoT) Technology in Agriculture	30	30	30	3
8	IoT – Telemedicine: Use Internet of Things (IoT) Technology in Telemedicine	30	30	30	3
9	IoT – Transport: Use Internet of Things (IoT) Technology in Transport	30	30	30	3
	Sub Total (B) – All 4 Electives	120	120	120	
	Min. Total Duration of the Course (A + Any 1 of the Elective NOS)	120	180	150	

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	Max Total Duration of the Course (A + B)	210	270	240	
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SECTION 1 ASSESSMENT

21	<p>Body/Bodies which will carry out an assessment: Telecom Sector Skill Council.</p> <p>Proposed Body/Bodies which will carry out an assessment: The assessment will be carried out via our affiliated assessment body.</p>
22	<p>How will RPL assessment be managed and who will carry it out? The RPL assessment will be managed by TSSC via its affiliate assessment partners.</p>
23	<p>Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.</p> <p>The emphasis is on practical demonstration of skills and knowledge based on the performance criteria. The assessment papers are developed by Subject Matter Experts (SME) available with the Assessment Agency as per the performance and assessment criteria mentioned in the Qualification Pack. The assessment papers are also checked for the various outcome-based parameters such as quality, time taken, precision, tools & equipment requirement etc. The assessment results are backed by evidences collected by assessors.</p> <ol style="list-style-type: none">1. The assessor needs to collect a copy of the attendance for the training done under the scheme. The attendance sheets are signed and stamped by the In-charge / Head of the Training Centre.2. The assessor needs to verify the authenticity of the candidates by checking the photo ID card issued by the institute as well as any one Photo ID card issued by the Central/Government. The same needs to be mentioned in the attendance sheet. In case of suspicion, the assessor should authenticate, and cross verify trainee's credentials in the enrolment form.3. The assessor needs to punch the trainee's roll number on all the test pieces.4. The assessor can take a photograph of all the students along with the assessor standing in the middle and with the center name/banner at the back as evidence.5. The assessor also needs to carry a photo ID card. <p>The assessment agencies are instructed to hire assessors with integrity, reliability and fairness. Each assessor shall sign a document with its assessment agency by which they commit themselves to comply with the rules of confidentiality and conflict of interest, independence from commercial and other interests that would compromise impartiality of the assessments.</p>

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Please attach most relevant and recent documents giving further information about assessment and/or RPL.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

ASSESSMENT EVIDENCE

Complete a grid for each component as listed in “Formal structure of the qualification” in the Summary.

NOTE: this grid can be replaced by any part of the qualification documentation which shows the same information – i.e., Learning Outcomes to be assessed, assessment criteria and the means of assessment.

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24. Assessment evidences

Title of Component:

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role: IoT Technical Service Operator

Qualification Pack TEL/Q6214

Sector Skill Council Telecom Sector Skill Council

Guidelines for Assessment

1. Criteria for assessment for each Qualifications Pack will be approved 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 approved 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 Qualifications Pack, every trainee should score a minimum of 70% of aggregate marks.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
TEL/N6252: Carry out Troubleshooting for IoT Devices and Connectivity Issues				
<u>Carry out troubleshooting for IoT devices</u>	21	35	-	9
PC1. arrange the appropriate tools and equipment for the maintenance of IoT devices	1	2	-	1
PC2. monitor the deployed IoT assets using the cloud system	1	2	-	1
PC3. check the power management modules, Radio Frequency (RF), energy and sensing modules for any malfunctioning and carry out troubleshooting accordingly	2	3	-	-

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PC4. monitor the data infrastructure and assist in maintaining it to ensure uninterrupted internet connectivity to all the deployed IoT assets	1	2	-	1
PC5. identify issues with different types of microcontrollers through testing and perform troubleshooting or replace the faulty/damaged microcontrollers with correct equipment	3	3	-	1
PC6. check for uninterrupted communication between RF modules and Wi-Fi, Bluetooth, transceiver, duplexer, etc.	1	3	-	1
PC7. carry out troubleshooting of electronic circuits using electronic simulation software	1	2	-	-
PC8. examine the sensors and transducers to identify faults with them and carry out appropriate troubleshooting	1	2	-	-
PC9. identify issues with Integrated Circuit (ICs) on microcontrollers and repair or replace them, as appropriate	3	3	-	1
PC10. check the functioning of 3G/4G/5G connectivity modules on the IoT devices	1	2	-	1
PC11. test data transfer from the IoT device to the cloud server	1	2	-	-
PC12. identify and troubleshoot issues with digital circuits	1	2	-	1
PC13. assist in maintaining a variety of communications infrastructures, such as fibre optic, coaxial, Unshielded Twisted Pair (UTP), Shielded Twisted Pair (STP) and other types of cable systems	2	3	-	-
PC14. test various types of network cables to identify issues with them and take appropriate remedial action	1	2	-	-
PC15. maintain the backup of relevant data on the cloud network and/or the relevant storage media as per the organisational policy	1	2	-	1
Carry out troubleshooting for connectivity issues	9	20	-	6
PC16. test the routing in the network by checking if the IoT device is connected and ensure no issue in the connectivity link	1	2	-	1
PC17. use the packet analysis tool to pick up data packets and debug them	1	2	-	1

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PC18. check if the IoT device is able to send a DHCP packet with a response from the server	2	3	-	-
PC19. check if the configuration parameters are correct	1	2	-	1
PC20. check the connection between IoT devices and cloud controller	1	3	-	1
PC21. use the remote mirroring feature to mirror the traffic from an IoT device on a remote device	1	2	-	-
PC22. carry out debugging or appropriate troubleshooting based on the checks performed to restore network connectivity	1	3	-	1
PC23. perform the assigned troubleshooting tasks within the Service Level Agreement (SLA) following the organisational processes	1	3	-	1
NOS Total	30	55	-	15
TEL/N6253: Assist in Providing IoT Solutions to Clients				
Coordinate client services	22	40	-	9
PC1. coordinate with the onsite technical teams for the deployments of IoT assets on client premises, providing the necessary support	3	4	-	1
PC2. check the IoT asset connectivity during deployments and assist with performing appropriate troubleshooting	4	7	-	1
PC3. assist in upgrading IoT devices and peripherals at client premises	2	4	-	1
PC4. assist in ensuring the new IoT applications and devices meet the client needs and address the relevant concerns	2	4	-	1
PC5. coordinate with the Radio Frequency (RF) engineer to provide switch and RF related support to end users	2	4	-	1
PC6. coordinate with the internal and external stakeholders to ensure service availability, quality and continuity assurance	2	5	-	1
PC7. ensure a high level of customer service with a focus on minimum restoration times	3	5	-	1
PC8. assist customers by answering their queries and resolving issues concerning IoT platforms and products	2	4	-	1
PC9. coordinate with the supervisor or other relevant personnel to resolve out of authority issues	2	3	-	1

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Maintain and review the records	8	20	-	1
PC10. collect the relevant information concerning the assignments received and completed at client premises, ensuring the accuracy of records	2	6	-	1
PC11. review the records through coordination with the supervisor to identify underlying client issues/concerns and determine their root cause	3	6	-	-
PC12. identify the appropriate solutions and assist in their implementation to improve the quality of products and services, and client satisfaction	3	8	-	-
NOS Total	30	60	-	10
TEL/N9101: Organise Work and Resources as per Health and Safety Standards				
Perform work as per quality standards	4	9	-	2
PC1. keep workspace clean and tidy	-	1	-	-
PC2. perform individual role and responsibilities as per the job role while taking accountability for the work	1	1	-	1
PC3. record/document tasks completed as per the requirements within specific timelines	-	1	-	1
PC4. implement schedules to ensure timely completion of tasks	-	2	-	-
PC5. identify the cause of a problem related to own work and validate it	2	2	-	-
PC6. analyse problems accurately and communicate different possible solutions to the problem	1	2	-	-
Maintain safe, healthy and secure working environment	16	27	-	4
PC7. comply with organisation's current health, safety, security policies and procedures	1	1	-	-
PC8. check for water spills in and around the work space and escalate these to the appropriate authority	1	2	-	1
PC9. report any identified breaches in health, safety, and security policies and procedures to the designated person	1	2	-	1
PC10. use safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc	1	2	-	1
PC11. avoid damage of components due to negligence in ESD procedures or any other loss due to safety negligence	2	3	-	1

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PC12. identify hazards such as illness, accidents, fires or any other natural calamity safely, as per organisation's emergency procedures, within the limits of individual's authority	2	1	-	-
PC13. participate regularly in fire drills or other safety related workshops organised by the company	1	3	-	-
PC14. report any hazard outside the individual's authority to the relevant person in line with organisational procedures and warn others who may be affected	1	3	-	-
PC15. maintain appropriate posture while sitting/standing for long hours	1	1	-	-
PC16. handle heavy and hazardous materials with care, while maintaining appropriate posture	1	1	-	-
PC17. sanitize workstation and equipment regularly	1	2	-	-
PC18. clean hands with soap, alcohol-based sanitizer regularly	-	1	-	-
PC19. avoid contact with anyone suffering from communicable diseases and take necessary precautions	-	1	-	-
PC20. take safety precautions while travelling e.g. maintain 1m distance from others, sanitize hands regularly, wear masks, etc.	1	2	-	-
PC21. report hygiene and sanitation issues to appropriate authority	1	1	-	-
PC22. follow recommended personal hygiene and sanitation practices, for example, washing/sanitizing hands, covering face with a bent elbow while coughing/sneezing, using PPE, etc	1	1	-	-
Conserve material/energy/electricity	7	16	-	3
PC23. optimize usage of material including water in various tasks/activities/processes	1	2	-	-
PC24. use resources such as water, electricity and others responsibly	1	2	-	1
PC25. carry out routine cleaning of tools, machine and equipment	1	2	-	-
PC26. optimize use of electricity/energy in various tasks/activities/processes	1	3	-	1
PC27. perform periodic checks of the functioning of the equipment/machine and rectify wherever required	1	3	-	1

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PC28. report malfunctioning and lapses in maintenance of equipment	1	2	-	-
PC29. use electrical equipment and appliances properly	1	2	-	-
Use effective waste management/recycling practices	3	8	-	1
PC30. identify recyclable, non-recyclable and hazardous waste	1	2	-	1
PC31. deposit recyclable and reusable material at identified location	1	3	-	-
PC32. dispose non-recyclable and hazardous waste as per recommended processes	1	3	-	-
NOS Total	30	60	-	10
TEL/N9102: Interact Effectively with Team Members and Customers				
Interact effectively with superiors	7	15	-	2
PC1. receive work requirements from superiors and customers and interpret them correctly	1	2	-	-
PC2. inform the supervisor and/or concerned person about any unforeseen disruptions or delays	2	4	-	1
PC3. participate in decision making by providing facts and figures, giving/accepting constructive suggestions	2	5	-	1
PC4. rectify errors as per feedback and ensure the errors are not repeated	2	4	-	-
Interact effectively with colleagues and customers	7	26	-	4
PC5. comply with organisation's policies and procedures for working with team members	1	2	-	-
PC6. communicate professionally using appropriate mode of communication such as face-to-face, telephonic and written	2	4	-	1
PC7. respond to queries and seek/provide clarifications if required	2	4	-	1
PC8. co-ordinate with team to integrate work as per requirements	-	3	-	-
PC9. resolve conflicts within the team/with customers to achieve smooth workflow	1	5	-	1
PC10. recognize emotions accurately in self and others to build good relationships	1	4	-	-
PC11. prioritize team and organization goals above personal goals	-	4	-	1
Respect differences of gender and ability	11	24	-	4

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PC12. maintain a conducive environment for all the genders at the workplace	2	5	-	1
PC13. encourage appropriate behavior and conduct with people across gender	2	5	-	1
PC14. assist team members with disability in overcoming any challenges faced in work	3	4	-	1
PC15. practice appropriate verbal and non-verbal communication while interacting with People with Disability (PwD)	2	4	-	1
PC16. ensure equal participation of the people across genders in discussions	2	6	-	-
NOS Total	25	65	-	10
TEL/N6254: Assist in Creating Smart Cities by Implementing Internet of Things (IoT) Solutions				
Assist in the implementation of smart lighting solutions	3	7	-	2
PC1. identify the highly frequented spots by the community members	1	2	-	1
PC2. coordinate with a relevant vendor for the installation of a sensor-based automated lighting system in the identified spots and areas	1	2	-	-
PC3. use sensor-based automated lighting systems to automate the switching on and off of lights according to the need and save energy	1	3	-	1
Assist in the implementation of smart parking solutions	4	12	-	2
PC4. identify the areas that experience issues with parking space management	1	2	-	-
PC5. coordinate with a relevant vendor for the installation of sensors at the identified locations to determine when the parking lots are free	1	3	-	1
PC6. use the appropriate smartphone applications configured to read the information transmitted by the sensors installed in parking lots regarding the availability of parking spaces	1	4	-	-
PC7. identify the available parking spaces using the relevant smartphone applications and provide real-time information to commuters	1	3	-	1
Assist in the implementation of smart traffic management solutions	5	18	-	2

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PC8. identify roads that frequently experience vehicular and pedestrian traffic	1	4	-	1
PC9. coordinate with the relevant vendor for the installation of sensors and Closed-Circuit Television (CCTV) cameras to monitor the traffic	1	4	-	-
PC10. regulate the vehicular and pedestrian traffic automatically to prevent congestion	1	3	-	-
PC11. ensure the use of vehicles fitted with appropriate IoT devices for planning commute and avoiding collision with other vehicles	1	4	-	-
PC12. ensure the availability of smartphone applications with voice search and location data capabilities for smart transit	1	3	-	1
Assist in the implementation of smart waste management solutions	4	14	-	1
PC13. coordinate with the relevant vendor to get waste collection bins fitted with sensors that send a notification when the bins are full	1	4	-	-
PC14. use the smart waste bins installed with sensors to determine if they are full remotely	1	3	-	-
PC15. follow the appropriate measures for the automatic route optimisation of waste collection vehicles	1	3	-	1
PC16. ensure waste is collected only from those bins that send notification of being full, thus achieving efficiency in waste collection and reducing the time and effort required	1	4	-	-
Assist in the implementation of smart utility solutions	2	7	-	1
PC17. use the smart grid solutions to allow consumers to store energy during the off-peak hours and lower the stress on the grid during peak hours	1	2	-	-
PC18. install smart meters in the buildings and connect to the smart energy grid	1	3	-	1
PC19. track and manage the energy flow effectively using the smart meters	-	2	-	-
Assist in the implementation of smart air quality monitoring solutions	2	12	-	2

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PC20. identify areas that experience air quality issues, such as excessive pollution and poor air circulation	1	3	-	-
PC21. coordinate with the relevant vendor for the installation of air quality monitors in the identified areas	-	2	-	1
PC22. use smart air quality monitors to monitor the Air Quality Index (AQI) and Indoor Quality Index (IQA)	-	3	-	1
PC23. follow and promote the recommended measures to improve the air quality	1	4	-	1
NOS Total	20	70	-	10
TEL/N6255: Use Internet of Things (IoT) Technology in Agriculture				
Prepare to use the IoT technology	6	15	-	4
PC1. select the appropriate smart sensor-based systems, field data recording and other relevant devices for use in agricultural operations	1	2	-	1
PC2. install and calibrate the relevant sensor-based systems and field data recorders at appropriate locations to monitor crops, soil, irrigation, livestock, storage facilities, etc.	2	5	-	1
PC3. attach the GPS receivers and smart sensors to the farm machineries such as tractors and harvesters to monitor their movement and guide them	1	4	-	1
PC4. set up the relevant mobile application and computer software for data collection and analysis	2	4	-	1
Collect the relevant data	6	16	-	6
PC5. monitor the farm conditions and infrastructure remotely with the help of smart sensors and field data recorders installed in the field	1	5	-	1
PC6. use a variety of sensors to record different types of data, such as soil properties and topography, distribution of irrigation water, moisture levels, crop yield, etc.	1	2	-	1
PC7. record geo-referenced data with the use of GPS receivers mounted on the farm machineries	1	3	-	1
PC8. use yield monitors to collect yield data for developing a yield map to identify the areas of productivity in the field	1	2	-	1

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PC9. carry out 3-Dimensional (3D) analysis of the field using GPS and GIS-based sensors, along with drones and satellite imagery	1	2	-	1
PC10. use sensors and remote sensing technology for creating maps and transferring data from the field to the appropriate software via integrated electronic communications	1	2	-	1
Analyse and utilise the collected data	13	24	-	10
PC11. retrieve the data recorded in the field with respect to various agricultural operations using the appropriate devices connected to the IoT system	2	2	-	2
PC12. carry out data analysis to gain insights into agricultural production processes and use the insights to make appropriate decisions for improving agricultural operations	1	2	-	1
PC13. develop and analyse computer-based images to research soils, fertilisers, pests, and other agricultural elements	2	4	-	1
PC14. use the advanced data analytics services to assess the impact of adverse weather conditions on the field and plan agricultural production accordingly	1	2	-	1
PC15. analyse the crop scouting data to be used for regulating the use of fertilisers and pesticides in the field	2	4	-	2
PC16. use the data analysis to identify and mitigate the adverse impacts of agricultural activities on the environment	2	4	-	1
PC17. monitor the supply chain in real-time utilising IoT to ensure supply as per the demand	1	3	-	1
PC18. prepare the relevant reports in graphical or tabular form, summarising field productivity and profitability	2	3	-	1
NOS Total	25	55		20
TEL/N6256: Use Internet of Things (IoT) Technology in Telemedicine				
Assist patients in using wearables	11	14	-	3
PC1. assist the patients via remote assistance in using wearables bio-sensors and other medical devices to check their blood pressure, temperature, heart rate, etc.	3	3	-	1

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PC2. ensure the sensing wearables and devices are connected to the relevant cloud services for the safe and successful transmission of the patient vitals for analysis by a doctor	2	4	-	1
PC3. assist the patient in the use of appropriate mobile phone application that can extract the data transmitted by bio-sensors and present it in an interpretable format	3	3	-	-
PC4. ensure the recording and transmission of Personal Health Information (PHI) complies with the applicable data security regulations to protect it from unauthorised access and misuse	3	4	-	1
Assist in the delivery of telemedicine services	24	36	-	12
PC5. assist the doctors in monitoring the patients remotely using the applicable IoT devices to prescribe appropriate treatment	3	3	-	1
PC6. assist in monitoring the patient's vital signs, such as temperature, blood pressure, heart rate and other attributes, with the help of bio-sensors placed in their home	3	3	-	1
PC7. use the appropriate IoT systems integrated with the Electronic Health Records (EHRs) of the patients	3	2	-	1
PC8. assist in evaluating the EHRs to compare test results, review patient history, and make thorough assessments	2	3	-	1
PC9. process and evaluate the patient's physiological data transmitted by wearables to the cloud server	3	2	-	1
PC10. assist in detecting specific disorders, diseases and health conditions with the use of appropriate IoT devices	2	2	-	1
PC11. ensure the availability of prescriptions and other relevant data to the patients that can be shared digitally with specialists and pharmacists	3	4	-	1
PC12. use a high-speed network, such as 5G for secure, reliable and uninterrupted connectivity	2	3	-	1

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PC13. ensure safe transmission and storage of patient's Personal Health Information (PHI) in compliance with the applicable laws using the relevant IoT technology	1	5	-	1
PC14. use the appropriate systems that provide a user-friendly interface between the patient and telemedicine service provider	1	4	-	1
PC15. assist in using the relevant clinical decision support system to detect patterns in patient's PHI and identify existing or potential health issues	1	5	-	2
NOS Total	35	50	-	15
TEL/N6257: Use Internet of Things (IoT) Technology in Transport				
Use IoT to track and manage vehicles	9	17	-	7
PC1. coordinate with the relevant vendor for the installation of the vehicle tracking system on vehicles to track them, ensuring to use 5G network for real-time tracking	1	3	-	1
PC2. ensure the recommended load on vehicles according to their capacity by monitoring the load with the help of sensors installed on them	2	3	-	1
PC3. track the vehicle/fleet route, trip duration, idling, speeding, harsh cornering, acceleration and braking using the IoT based vehicle tracking system	2	3	-	2
PC4. use sensors and actuators connected with the appropriate IoT system to perform appropriate vehicle functions automatically, such as emergency auto brakes	1	3	-	1
PC5. collect and analyse data concerning fuel consumption on vehicles using the relevant IoT based system	2	2	-	1
PC6. arrange for regular maintenance of vehicle tracking system and relevant accessories to ensure efficient operations	1	3	-	1
Use RFID for toll collection	9	16	-	6
PC7. identify the appropriate type of RFID tag readers for installation at toll collection booths	1	3	-	1

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PC8. select appropriate spots at toll collection booths for the installation of RFID readers to facilitate the easy and efficient reading of RFID tags installed on vehicles	2	3	-	1
PC9. coordinate with the relevant vendor for the installation of RFID readers at the identified spots	1	3	-	1
PC10. ensure the RFID readers are connected securely to a power source and have a stable 5G network connection to communicate with the relevant systems	2	2	-	1
PC11. conduct appropriate tests to ensure RFID readers are able to read data from RFID tags and toll is collected without any issues through wireless communication with the relevant systems	1	2	-	1
PC12. analyse the toll collection reports generated by the toll collection system to ensure the data is accurate and has no anomalies	2	3	-	1
Use RFID for fare collection	12	17	-	7
PC13. coordinate with the relevant vendor for the installation of RFID smart card readers at entry and exit points on public transport vehicles	2	3	-	1
PC14. ensure the odometer on the transport vehicles are able to collect data concerning the revolution of wheels	2	3	-	1
PC15. ensure the smart card readers are connected to the odometer on the transport vehicle and can charge passengers' smart cards based on the distance covered by them	2	2	-	1
PC16. arrange for uninterrupted power supply to smart card readers	1	2	-	1
PC17. use the 5G network connectivity for reliable and real-time collection of fare collection data	1	3	-	1
PC18. check the fare collection reports to ensure fare computation and collection data is correct	2	2	-	1
PC19. coordinate with the smart card reader manufacturer for the identification and resolution of potential issues with smart card readers	2	2	-	1
NOS Total	30	50	-	20

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Outcomes to be assessed/NOSs to be assessed	Assessment criteria for the outcome
Provided in the above section	
Means of assessment 1 <ol style="list-style-type: none">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. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below.)4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on these criteria.	
Means of assessment 2 Add boxes as required.	
Pass/Fail <ol style="list-style-type: none">1. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS.2. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.	

NSQF QUALIFICATION FILE

SECTION 2

25. EVIDENCE OF LEVEL

Title/Name of qualification/component: IoT Technical Service Operator Level: 3			
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Process	<p>Diagnose and rectify faults in the IoT System</p> <ul style="list-style-type: none"> • Troubleshooting for IoT devices and connectivity issues. • Carry out repair and maintenance activities of IoT devices and peripherals at client premises. • Fix the identified bugs and defects 	<p>The individual is responsible to attend to the client queries and providing appropriate solutions following the organisational standards.</p> <p>The individual must have attention to detail along with strong analytical and problem-solving skills.</p> <p>Hence, this is level 3.</p>	3
Professional knowledge	<p>Factual and theoretical knowledge in broad contexts within a field of work or study.</p> <ul style="list-style-type: none"> • Technical specifications of products and processes • Knowledge about the basics of IoT technology and networking fundamentals • Maintenance standards/guidelines 	<p>The individual should have a good understanding of technical specifications and functionalities of products and processes, knowledge of functioning techniques and knowledge about managing concerns/issues, and standards/guidelines of IoT services</p> <p>Hence, this is level 3.</p>	3

NSQF QUALIFICATION FILE

Title/Name of qualification/component: IoT Technical Service Operator Level: 3			
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Professional skill	<p>A range of cognitive and practical skills is required to generate solutions to specific problems in a field of work or study.</p> <ul style="list-style-type: none"> • Knowledge of cloud computing platforms, such as AWS, Azure, GCP, etc • Providing technical support concerning the Internet of Things (IoT) systems. • Troubleshooting Network and Devices. 	<p>The individual is required to have a range of technical skills, to be competitive in this job role, such as strong analytical and problem-solving skills, verbal and written communication skills. Comply with standards related to IoT Services.</p> <p>Hence, this is level 3.</p>	3
Core skill	<p>Core Domain Skill:</p> <ul style="list-style-type: none"> • Understand the functioning of 3G/ 4G/ 5G connectivity modules on IoT devices. • Understand the scripting languages, such as BASH, Python or JavaScript • Able to understand the benefits of using Structured Query Language (SQL) • Knowledge of the functioning and process of different types of microcontrollers/processors. 	<p>The individual is required to diagnose and resolve common and complex IoT device-related issues, assisting in providing IoT solutions to clients and carrying out documentation activities.</p> <p>Hence, this is level 3</p>	3

NSQF QUALIFICATION FILE

Title/Name of qualification/component: IoT Technical Service Operator Level: 3			
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Responsibility	<p>Responsibility for completing the work assigned and reporting the same as per standards.</p> <ul style="list-style-type: none"> • Understand the job role and follow the organisational policy • Record and report about the work status • Follow safety regulations at workplace • Work along with colleagues and supervisors 	<p>The individual is responsible for carrying out troubleshooting for IoT devices and connectivity issues. Also, responsible for assisting in providing IoT solutions to clients at their premises as per the organisation's standards.</p> <p>Hence Level 3.</p>	3

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NSQF QUALIFICATION FILE

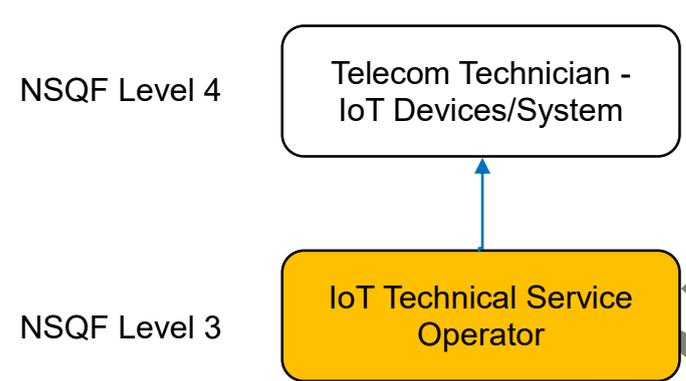
SECTION 3 **EVIDENCE OF NEED**

26	<p>What evidence is there that the qualification is needed? What is the estimated uptake of this qualification and what is the basis of this estimate?</p> <ol style="list-style-type: none">1. Feedback from industry was collected with respect to roles for which qualification pack development was to be prioritized.2. Skills Gap analysis reports for industry demand Training duration w.r.t current and potential capacity envisaged for potential supply.
27	<p>Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences</p> <p>We have received the approval form the Line Ministry department.</p>
28	<p>What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF? Give justification for presenting a duplicate qualification</p> <p>NSDC list of Approved and Under-Development QPs was checked prior to commencement the work.</p>
29	<p>What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated? Specify the review process here</p> <ul style="list-style-type: none">• Agencies have been appointed by the SSC to interact with training providers to gather feedback in implementation• Monitoring of results of assessments• Employer feedback will be sought post-placement• A formal review is scheduled by 2025

Please attach most relevant and recent documents giving further information about any of the topics above.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

SECTION 4
EVIDENCE OF PROGRESSION

<p>3 0</p>	<p>What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?</p> <ol style="list-style-type: none">1. Endorsed and accepted by the industry players2. Formal recognition from the industry players3. Horizontal and vertical mobility options are available <p>Annexure 1: Career Map of IoT Technical Service Operator</p>  <p>The diagram illustrates a career progression path. On the left, two levels are listed: 'NSQF Level 4' and 'NSQF Level 3'. To the right of 'NSQF Level 4' is a white rounded rectangular box containing the text 'Telecom Technician - IoT Devices/System'. To the right of 'NSQF Level 3' is a yellow rounded rectangular box containing the text 'IoT Technical Service Operator'. A blue arrow points upwards from the yellow box to the white box, indicating a progression from the lower level to the higher level.</p>
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