QUALIFICATION FILE – Telecom technician-PC Hardware and Networking (NL/S/L4/C014)

CONTACT DETAILS OF THE AWARDING BODY FOR THE QUALIFICATION

Name and address of awarding body:

NATIONAL INSTITUTE OF ELECTRONICS AND INFORMATION TECHNOLOGY
Electronics Niketan, 6, CGO Complex
Lodhi Road, New Delhi 110003

Name and contact details of individual dealing with the submission

Name: Manoj Kumar M K
Position in the organisation: Senior Technical Officer

Address if different from above
> NATIONAL INSTITUTE OF ELECTRONICS AND
> INFORMATION TECHNOLOGY (NIELIT),
> NIT CAMPUS POST, KOZHIKODE, KERALA. PIN –
> 673601.
> Tel number(s) 0495 2287266 ext. 224

E-mail address: manojkumar@nielit.gov.in

List of documents submitted in support of the Qualifications File

1. Evidence of Job Market / Requirement in the Industry (Annexure I)

2. Detailed Curriculum (Annexure II)

3. Industry Validation (Annexure III)

4. Evidence of Need: Requirement in the Industry (Annexure IV, V, VI)

SUMMARY

Qualification Title:	Telecom Technician- PC Hardware and Networking
Qualification Code	NL/S/L4/C014 NIELIT/NW/2/87
Nature and purpose of the qualification:	**Nature**: ❖ Certificate Course which will help in employment. **Purpose:** This Qualification is aligned to Level 4 The module has been designed to provide To obtain proficiency in the different components of PC (processors, mother board, RAM, I/O Devices) and networking components (Simple Network Components, Networking Components like Switch, Router, Hub, NIC, PC/Laptop, Router) and the various processes of setting up different

	kinds of network. It also helps to gain proficiency in trouble shooting of networks, installation of software, setting up network security. The students are also equipped with good Communicative English Skills, soft Skills and Basic IT skills required for good performance in any job in the modern world.
Body /bodies which will award the qualification:	**Examination Cell,** National Institute of Electronics and Information Technology 6-CGO Complex, Electronics Niketan Lodhi Road, New Delhi. 110003.
Body which will accredit providers to offer courses leading to the qualification:	**Accreditation Cell,** National Institute of Electronics and Information Technology 6-CGO Complex, Electronics Niketan Lodhi Road, New Delhi. 110003.
Body /bodies which will Be responsible for assessment:	**Examination cell,** National Institute of Electronics and Information Technology 6-CGO Complex, Electronics Niketan Lodhi Road, New Delhi. 110003.
Occupation(s) to which the qualification gives access:	Service Technician-PC Hardware
Licensing Requirements	N/A
Proposed level of the qualification in the NSQF	Level-4
Anticipated volume of training/learning required to complete the qualification	350 Hours
Entry requirements/ Recommendations	10th/12th Pass.
Progression from the Qualification	**1) In Academic:** Telecom Technician-PC Hardware & Networking (NL/S/L4/C014) Certificate Course in System Administration using unix (L5) Certificate Course in System Administration using Linux (L5) A Level Course(L6) **Professional**: Service technician ->Senior Service technician -> Service Supervisor
Planned arrangements for RPL.	RPL Policy will be incorporated once RPL strategy is finalized.

International Compatibility where Known.	NA
Date of Planned review of the Qualification	After Every 2 Years

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Formal structure of the qualification:

Course Structure: this course contains

PC Hardware Theory & Practical

Networking theory & Practical

Communicative English

Basic IT skills

Module Code	Module Name	Mandatory /Optional	Estimated Size (Learning Hours)	Level
1	PC Hardware	M	25	Level 4
2	PC Hardware Practical	M	35	Level 4
3	Computer Networking	M	25	Level 4
4	Computer Networking Practical	M	35	Level 4
5	Internship	M	50	Level 4
5	Communicative English	M	100	Level 4
6	Basic IT Skills	M	80	Level 4

| Recommended Hardware: | Scrap CPUs, Scrap PC Cabinet, SMPS and other basic components, Scrap Motherboard and Different Types of Processors, Scrap RAM, Desktop PC without loading OS, Scrap UPS, Laptop, Tablet, Smart Phones, Simple Network Components, Networking Components like Switch, Router, Hub, NIC, PC/Laptop, Router, Connectivity

Network lab |
|---|---|

Recommended Software:	Nil
Text Books	Nil
Reference books	Course Material Prepared by Training partner

Section 1
ASSESSMENT

Body/Bodies which will carry out assessment:
Examination Cell
NATIONAL INSTITUTE OF ELECTRONICS AND INFORMATION TECHNOLOGY
Electronics Niketan, 6, CGO Complex
Lodhi Road, New Delhi 110003

Will the assessment body be responsible for RPL assessment?
No.
Selection is based on Marks received for Qualifying Examination there will not be any entrance test for the selection of the Participants of the Course.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF:
Assessment is done by Examination Cell, NIELIT, New Delhi

Staff deployed for the Examination Centre

Exam Superintendent (ES): There will be one ES for each centre for both Online theory examination and Practical Assessment. The ES will be appointed by the NIELIT. ES is generally one of the empanelled expert of NIELIT / Technical personnel working in government or private sector. In case of NIELIT Location, the official nominated by respective Centre Director would act as ES. ES is responsible for the smooth conduct of the examination. For effective and efficient discharge of ES responsibilities, the Exam centre/ TP will provide support staff & technical manpower for Online Theory Examination server setup, practical Lab setup etc. ES shall mandatorily carry his/her photo identity.

Subject Expert (SE) for Practical Assessment: RC may appoint an SE if they feel it is required. The Practical Assessment needs subject expertise, a Subject Expert (SE) of the relevant field **may be** deputed for conduct of Practical Assessment. Subject Expert is responsible for conducting the Practical Assessment under the supervision of ES. SE shall mandatorily carry his/her photo identity.
Note:
⦿ Under no circumstances, students should be enrolled / engaged in examination work.
⦿ The Controller of Examination is responsible for generation of their logins, passwords etc.

Examination	No's of Questions	Time (Minutes)	Max Marks	Min Pass Marks	Mode of Examination
Online Theory Examination	80	120	80	32 (40%)	ON-LINE
Practical & Viva Voice	--	180	50	20 (40%)	OFF-LINE
Internal Assessment			20	--	Awarded by TP
Grand Total			150	75 (50%)	

There is no negative marking in Online Theory Examination.

 Online Theory Examination will have Multiple Choice Questions (MCQs).

 Both Online Theory Examination and Practical Assessment for one particular batch should be preferably conducted on **one single day**. Preferably Practical Assessment in 1st Half followed by the Online Theory Examination in the 2nd half. In case of unforeseen circumstances, examination may be scheduled / re-scheduled to the next available date.

 Candidate must report at the examination venue one (1) hour prior to the commencement of the examination. No candidate would be allowed to appear in examination after 15 minutes of the commencement of examination.

Title of Unit/Component:

Outcomes to be assessed	Assessment Criteria for the outcome	Means of Assessment			
		Total Marks	Written	Practical	Internal
Will be able to install & configure various Operating systems.	Loading and configuration of Microsoft Client O/S Win XP /Win 7 and Windows 8 Loading and configuration of Microsoft Server O/S – Win 2003 server /Win 2008 Server Loading and configuration of Linux Clients and server OS. Firewall configuration, Antivirus/Internet security loading and configuration. Multiple OS loading and troubleshooting if there is any.	17	12	05	NA
	Installation and configuration of I/O	18	13	05	NA

	devices–Printers, Webcams, Scanners, Digital Camera, USB, Wifi, USB BT, USB Storages, Overhead/LCD/DLP/LED Projectors				
	Assembling of a PC Identification and repair of board complaints. Replacement of card if needed.	25	15	10	NA
	Total Marks	**65**	**40**	**20**	**5**
Will be able to establish Computer networking & Sharing devices.	Identification of Internet working elements like Hubs, switches, routers Network Cable Crimping-Straight through and Cross over Crimping using UTP cables and testing Installation of NIC in PCs and trouble shooting Client configuration for networking, advanced client configuration for connecting multiple networks Setting up of a simple LAN, Checking the connectivity using DOS commands Sharing files, Printers, CD drives Sharing desktops, Remote desktop, Using Applications like Team Viewer for accessing a remote computer.				

	Configuration of client PCs for connecting multiple networks etc. Installation of Windows server. Configuration of server for Web Server and FTP server, Verification from a client. Basic router configuration, Connecting through Hyper terminal, Configuring router connecting different networks Broadband Lab- Type 1 and Type 2 Modems, Modem configuration for internet connection Troubleshooting of hardware resources like printer, scanner, hard disk, mouse, keyboard etc., software resources (application troubleshooting) and the networks and networking resources like routers, switches, hub, cable, modem etc.					
	Total Marks	**40**	**20**	**15**	**5**	
Will be able to Communicate clearly with clients, Colleagues & Seniors.	Organizing a seminar, presentation Telling the right story Speaking with clarity	02	02	00	NA	
	Observing them in actual interactions in every day environment. Interaction with colleagues, seniors & clients.	02	02	00	NA	

	Technical writing, job report preparation. Work in a team: Group project Record, Analyze and rectify customer complaints. Interact with clients for their problem and understand the nature of their work	02	02	00	NA
	Language Proficiency Tests	02	02	00	NA
	Preparation and Presentation of a Project	07	02	05	NA
	Total Marks	**20**	**10**	**5**	**5**
Will be able to prepare document, Chart, Presentation etc on computer & can communicate thru Emails.	Interact via e-mails i.e. send & receive mais	06	03	03	NA
	Preparation of (i)Documents (ii)Presentation.	08	04	04	NA
	Preparation of worksheet Project presentation	06	03	03	NA
	Total Marks	**25**	**10**	**10**	**5**
	Grand Total	**150**	**80**	**50**	**20**

Means of Assessment:

Online assessments (LAN and Web based), carried out using a variety of question formats applicable for the course.

Pass/Fail

Following Grading Scheme (on the basis of total marks & individual marks) will be followed:

Grade	Marks Range (in %)
Pass	>=40 each in online Theory Examination & Practical >=50 in aggregate (Internal, Theory & Practical)

Fail	<40 each in online Theory Examination & Practical <50 in aggregate (Internal, Theory & Practical)

SECTION 2

EVIDENCE OF LEVEL

Title : **Certificate Course in** Telecom technician-PC Hardware and Networking			Level : 4
NSQF Domain	**Outcomes of the Qualification/Component**	**How the job role relates to the NSQF Level Descriptors**	**NSQF Level**
Process required	The candidate is required to apply basic knowledge of electricity, and electronics t for installation and systematic testing & troubleshooting of PC Hardware Equipments using appropriate tools and equipments.	Work in familiar, predictable, routine, situation of clear choice.	**4**
Professional knowledge	Factual knowledge about:- assembling a PC, standard methodologies to set up a system using various components of the system, designing the network and setting up a network, trouble shooting the various hardware resources like printer, scanner, hard disk, mouse, keyboard etc, trouble shooting the software resources to troubleshoot of networks and networking resources like routers, switches, hub, cable, modem etc.	Factual knowledge of field of knowledge or study.	**4**

Professional skill	Recall and demonstrate practical skills to:- assemble a PC and standard methodologies to set up a system using various components of the system Designing the network topologies and setting up various types of networks Troubleshooting of hardware resources like printer, scanner, hard disk, mouse, keyboard etc., software resources and the networks and networking resources like routers, switches, hub, cable, modem etc, Setting up Broadband Network & Wireless networks	Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts.	**4**
Core skill	Language to communicate with written or oral, with required clarity , skill to basic arithmetic and algebraic principles, basic understanding of social, political and natural environment The job holder is expected to have **1.Reading skills** Read and understand technical manuals, work orders and reports Read and understand organizational health and safety instructions **2.Writing Skills** Fill up record sheets clearly, concisely and accurately as per company procedures **3.Communication Skills** Clearly communicate relevant information to supervisors Respond appropriately to queries	Language to communicate written or oral, with required clarity, skill to basic arithmetic and algebraic principles, basic understanding of social political and natural environment.	**4**

	Communicate with customer/customer facing teams to understand handset performance issues		
	Communicate in the local language		
	Convey proposed solution to the customers		
	4.Analytical Skills		
	Record, Analyse and rectify customer complaints.		
	Interpret reports, readings and numerical data		
	Keep up to date with new technology and performance issues		
Responsibility	The job holder is expected to complete assigned tasks maintaining safety at workplace & maintain IPR of organization & customers. He/she is expected to undertake on the-job learning and participate in training and development, interventions and assessments. Hence the individual working in this job role has complete responsibility for delivering quality of his own work	Responsibility for own work and learning.	**4**

SECTION 3
EVIDENCE OF NEED

What evidence is there that the qualification is needed?
1. Report of taskforce to suggest measures to stimulate the growth of IT, ITES, and Electronics Hardware manufacturing Industry in India – Dec 2009.

(Annexure IV)

2. Challenges and Solutions in bridging the gap of Skilled human Resource (HR) in Electronics System Design and Manufacturing System. Workshop report Feb 2012.

(Annexure V)

3. Proposal to NSDC on the formation of Sector Skills Council: Electronics.

(Annexure VI)

4. Employability and skills set of newly graduated Engineers in India – Andreas Blom, Hiroshi Sakei policy research working paper (5640). World Bank.

(Annexure VII)

5. Human Resource and skill Requirements in the Electronics and IT Hardware Industry. "Study on mapping of human resource Skill gaps in India till 2022" – NSDC / ICRA management Consulting Services Limited. (IMACS)

6. *View Point* - Make in India -*"A Way to Boost Manufacturing and Employment opportunities" Electronics for You, June 2016.*

What is the estimated uptake of this qualification and what is the basis of this estimate?

Estimated uptake is 40 students / Batch with 2 Batches / Year and on the basis of identified skill gap in the following report

1. Human Resource and skill Requirements in the Electronics and IT Hardware Industry.

"Study on mapping of human resource Skill gaps in India till 2022" – NSDC / ICRA management Consulting Services Limited. (IMACS)

What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF?

The Qualification does not exist as per the information available in public domain.

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?
Based on feedback by participants, employers and market survey the qualification will be reviewed, revised and updated in every 2 years.

SECTION 4

EVIDENCE OF RECOGNITION AND PROGRESSION

> **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?**
>
> This qualification comprises of much relevant topics in all aspects of the industrial requirement in the field of *PC Hardware and Networking*. Hence an incumbent can possibly get higher job roles like Service Technician /Test Engineer /Hardware technician/Network administrator / Consultancy / Entrepreneur etc. And ensure that the design of the course will timely be modified as per the industrial demands. However incumbent can do any higher level course in the related field.