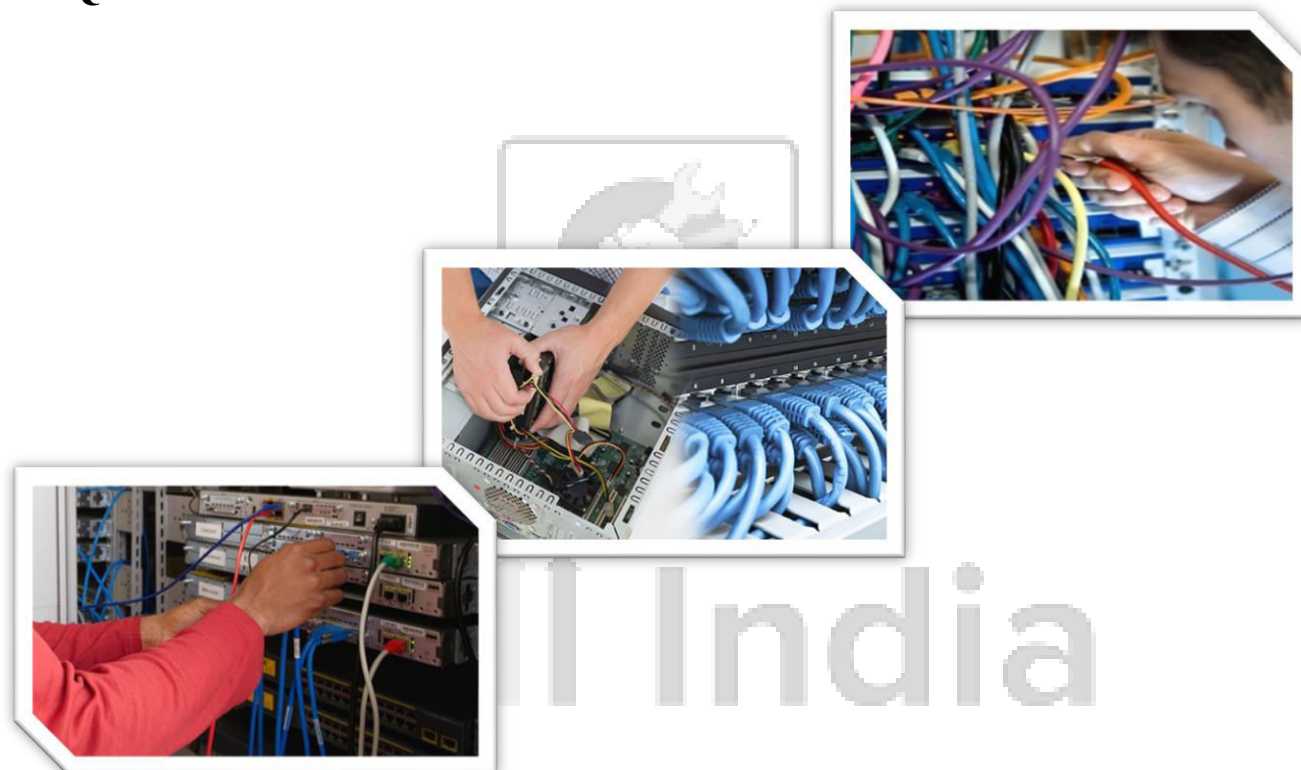# COMPUTER NETWORKING TECHNICIAN

**COMPETENCY BASED CURRICULUM**
**(Duration: 1 Year 3 Months)**

**APPRENTICESHIP TRAINING SCHEME (ATS)**
**NSQF LEVEL- 4**

**SECTOR – IT AND ITES**

GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

# COMPUTER NETWORKING TECHNICIAN

**(Revised in 2018)**
## APPRENTICESHIP TRAINING SCHEME (ATS)

## NSQF LEVEL - 4

Developed By

Ministry of Skill Development and Entrepreneurship
Directorate General of Training
**CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE**
EN-81, Sector-V, Salt Lake City,
Kolkata – 700 091

# ACKNOWLEDGEMENT

*COMPUTER NETWORKING TECHNICIAN*

# CONTENTS

कौशल भारत - कुशल भारत

# 1. BACKGROUND

### 1.1 Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate(ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry**.** There are four categories of apprentices namely**; trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

### 1.2 Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

## 1.3    Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22$^{nd}$ December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.

- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.

- Scope has been extended also to non-engineering occupations.

- Establishments have been permitted to outsource basic training in an institute of their choice.

- The burden of compliance on industry has been reduced significantly.

# 2. TRAINING SYSTEM

## 2.1 GENERAL

Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under aegis of National Council of Vocational Training (NCVT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programmes of NCVT for propagating vocational training.

Computer Networking Technician trade under ATS is one of the most popular courses delivered nationwide through different industries. The course is of two years (01 Block) duration. It mainly consists of Domain area and Core area. In the Domain area Trade Theory & Practical impart professional - skills and knowledge, while Core area - Workshop Calculation and science, Engineering Drawing and Employability Skills imparts requisite core skills & knowledge and life skills. After passing out the training programme, the trainee is being awarded National Apprenticeship Certificate (NAC) by NCVT having worldwide recognition.

**Broadly candidates need to demonstrate that they are able to:**

- Read & interpret technical parameters/document, plan and organize work processes, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge, core skills & employability skills while performing jobs and solve problem during execution.
- Check the job/assembly as per drawing for functioning, identify and rectify errors in job/assembly.
- Document the technical parameters related to the task undertaken.

# COMPUTER NETWORKING TECHNICIAN

### 2.2 CAREER PROGRESSION PATHWAYS:

- Indicative pathways for vertical mobility.
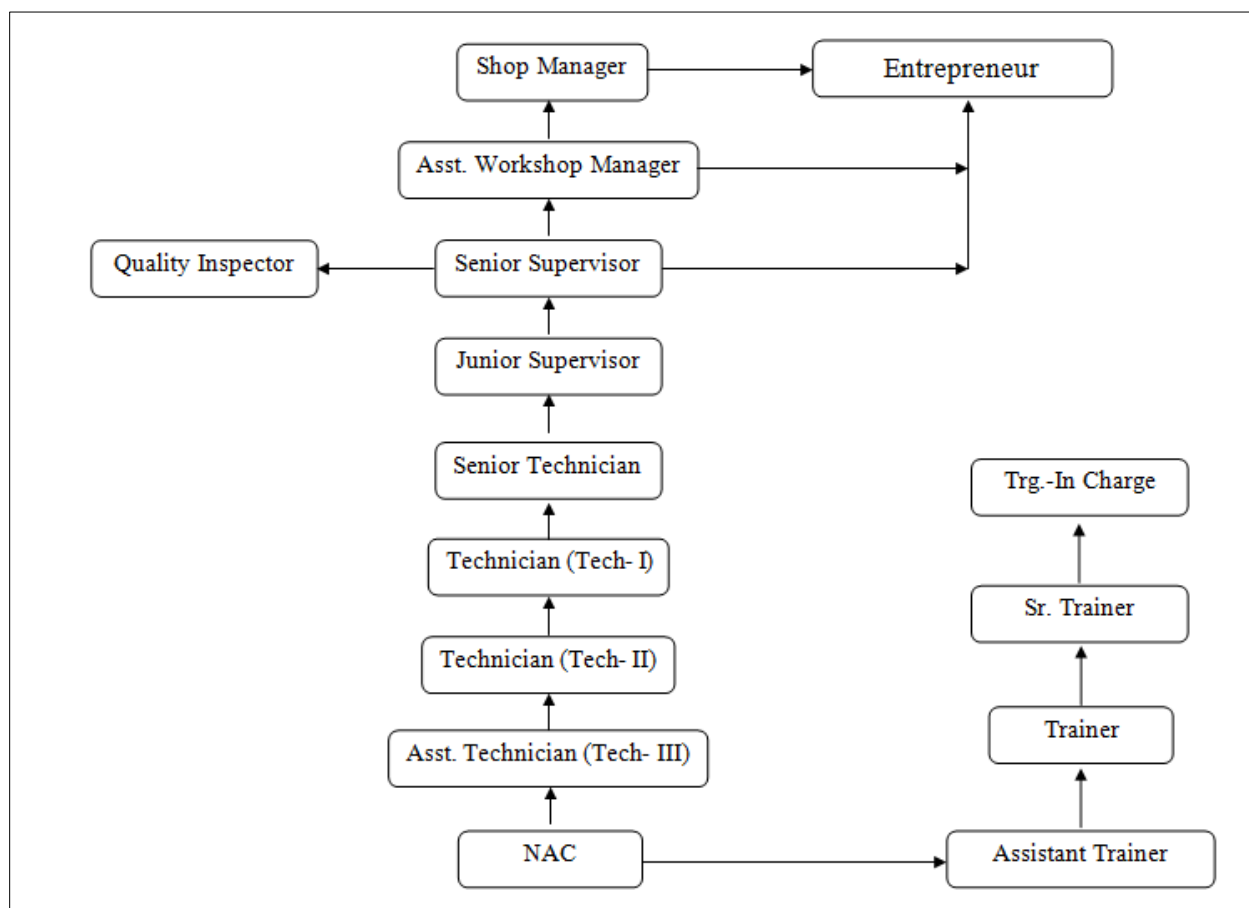


## 2.3 COURSE STRUCTURE:

Table below depicts the distribution of training hours across various course elements during a period of one year (*Basic Training and On-Job Training*) : -

**Total training duration details: -**

| Time (in months) | 1-3 | 4 - 15 |
|---|---|---|
| **Basic Training** | **Block– I** | ----- |
| **Practical Training (On - job training)** | ---- | **Block – I** |

# COMPUTER NETWORKING TECHNICIAN

## A. Basic Training

For 02 yrs. course (Engg.) :-(**Total 06 months:** 03 months in 1$^{st}$yr. + 03 months in 2$^{nd}$ yr.)

For 01 yr. course (Engg.) :-(**Total 03 months:** 03 months in 1$^{st}$ yr.)

| S No. | Course Element | Total Notional Training Hours | |
|---|---|---|---|
| | | For 02 Yrs. course | For 01 Yr. course |
| 1. | Professional Skill (Trade Practical) | 550 | 275 |
| 2. | Professional Knowledge (Trade Theory) | 240 | 120 |
| 3. | Workshop Calculation & Science | 40 | 20 |
| 4. | Engineering Drawing | 60 | 30 |
| 5. | Employability Skills | 110 | 55 |
| | **Total (Including internal assessment)** | **1000** | **500** |

## B. On-Job Training:-

For 02 yrs. Course (Engg.) :-( **Total 18 months:** 09 months in 1$^{st}$ yr. + 09 months in 2$^{nd}$ yr.)

Notional Training Hours for On-Job Training: 3120 Hrs.

For 01 yr. course (Engg.) :-( **Total 12 months**)

Notional Training Hours for On-Job Training: 2080 Hrs.

## C. Total training hours:-

| Duration | Basic Training | On-Job Training | Total |
|---|---|---|---|
| **For 02 yrs. course** (Engg.) | 1000 hrs. | 3120 hrs. | 4120 hrs. |
| **For 01 yr. course** (Engg.) | 500 hrs. | 2080 hrs. | 2580 hrs. |

## 2.4 ASSESSMENT & CERTIFICATION:

The trainee will be tested for his skill, knowledge and attitude during the period of course and at the end of the training programme as notified by Govt of India from time to time. The Employability skills will be tested in first two semesters only.

a) The Internal assessment during the period of training will be done by Formative assessment method by testing for assessment criteria listed against learning outcomes. The training institute have to maintain individual *trainee portfolio* as detailed in assessment guideline. The marks of internal assessment will be as per the template (Annexure – II).

## COMPUTER NETWORKING TECHNICIAN

b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NAC will be conducted by NCVT on completion of course as per guideline of Govt of India. The pattern and marking structure is being notified by govt of India from time to time. The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

## 2.4.1 PASS REGULATION

The minimum pass percent for Practical is 60% & minimum pass percent for Theory subjects 40%. The candidate pass in each subject conducted under all India trade test.

## 2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking assessment. Due consideration should be given while assessing for team work, avoidance/reduction of scrap/wastage and disposal of scarp/wastage as per procedure, behavioral attitude, sensitivity to environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work

Evidences of internal assessments are to be preserved until forthcoming semester examination for audit and verification by examination body. The following marking pattern to be adopted while assessing:

| Performance Level | Evidence |
|---|---|
| (a) Weightage in the range of 60 -75% to be allotted during assessment | |
| For performance in this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship. | • Demonstration of good skill in the use of hand tools, machine tools and workshop equipment<br>• Below 70% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. |

| | • A fairly good level of neatness and consistency in the finish <br> • Occasional support in completing the project/job. |
|---|---|
| **(b)Weightage in the range of above75% - 90% to be allotted during assessment** | |
| For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship. | • Good skill levels in the use of hand tools, machine tools and workshop equipment <br> • 70-80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. <br> • A good level of neatness and consistency in the finish <br> • Little support in completing the project/job |
| **(c) Weightage in the range of above 90% to be allotted during assessment** | |
| For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship. | • High skill levels in the use of hand tools, machine tools and workshop equipment <br> • Above 80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. <br> • A high level of neatness and consistency in the finish. <br> • Minimal or no support in completing the project. |

Brief description of Job roles of Computer Networking Technician After completion of the course the apprentices shall be qualified for one or more of the following job roles:

- Computer Networking Technician personnel is to support and maintain computer network systems and related devices.
- The person includes installing, configuring, operating, repairing, diagnosing, maintaining, and upgrading all network devices and equipment while ensuring optimal workstation performance.
- The person will also troubleshoot problem areas in a timely and accurate fashion, and provide end user training and assistance where required. Install, maintain and setup LAN with Internet Connection.
- Determining and installing appropriate security measures.
- Provide technical support on-site or via phone or email
- Install, configure, and maintain common end user application software. May train and provide assistance to end users.
- Troubleshoots software and hardware problems related to Internet applications.
- Ability to control network programs, network management, and network architecture

**Reference NCO – 2015:**

| | | |
|---|---|---|
| i) | 2523.9900 | (Computer Network Professionals, Other) |
| ii) | 3513.9900 | (Computer Network and systems Technician, Other) |

# 4. NSQF LEVEL COMPLIANCE

NSQF level for Computer Networking Technician trade under ATS: **Level 4**

As per notification issued by Govt. of India dated- 27.12.2013 on National Skill Qualification Framework total 10 (Ten) Levels are defined.

Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:

a. Process
b. professional knowledge,
c. professional skill,
d. core skill and
e. Responsibility.

The Broad Learning outcome of Computer Networking Technician trade under ATS mostly matches with the Level descriptor at Level- 4.

The NSQF level-4 descriptor is given below:

| LEVEL | Process required | Professional knowledge | Professional skill | Core skill | Responsibility |
|---|---|---|---|---|---|
| Level 4 | work in familiar, predictable, routine, situation of clear choice. | factual knowledge of field of knowledge or study | recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts | language to communicate written or oral, with required clarity, skill to basic Arithmetic and algebraic principles, basic understanding of social political and natural environment. | Responsibility for own work and learning. |

# 5. GENERAL INFORMATION

| Name of the Trade | Computer Networking Technician |
|---|---|
| **NCO - 2015** | 2523.9900, 3513.9900 |
| **NSQF Level** | Level – 4 |
| **Duration of Apprenticeship Training** (Basic Training + On-Job Training) | 3 months + One year (01 Block of 12 month duration). |
| **Duration of Basic Training** | a) Block –I : 3 months<br>**Total duration of Basic Training: 3 months** |
| **Duration of On-Job Training** | a) Block–I: 12 months<br>**Total duration of Practical Training: 12 months** |
| **Entry Qualification** | Passed 10th class examination under 10+2 system of education or its equivalent |
| **Selection of Apprenticeship** | The apprentices will be selected as per Apprenticeship Act amended time to time. |
| **Instructors Qualification for Basic Training** | As per ITI instructors qualifications as amended time to time for the specific trade. |
| **Examination** | The internal examination/ assessment will be held on completion of each block.<br>Final examination for all subjects will be held at the end of course and same will be conducted by NCVT. |
| **Rebate to Ex-ITI Trainees** | 03 months |
| **CTS trades eligible for Computer Networking Technician Apprenticeship** | • Information Technology<br>• Computer Hardware and Network Maintenance |

*Note:*
- *Industry may impart training as per above time schedule for different block, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspects is compromised.*
- *For imparting Basic Training the industry to tie-up with ITIs having such specific trade and affiliated to NCVT.*

# 6. LEARNING OUTCOME

### 6.1 GENERIC LEARNING OUTCOME

The following are minimum broad Common Occupational Skills/ Generic Learning Outcome after completion of the Computer networking technician course of 01 years duration under ATS.

**Block I:-**

1. Recognize & comply safe working practices, environment regulation and housekeeping.

2. Understand and explain different mathematical calculation & science in the field of study including basic electrical. *[Different mathematical calculation Algebra, decimal, binary addition & subtraction , concept of storage units, calculation hard disk capacity ,Use of Electricity, Types of current AC, DC, , voltage, resistance, types of connections - series, parallel, electric power, unit of electrical energy. Concept of earthling,]*

3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical construction, Dimensioning, Free hand sketching of straight lines, dotted lines, chain lines, rectangles, square, circles, polygons etc, Diagram of a Hard disk, diagram of internal components and structure Block diagram of SMPS and diagram of various power connectors, Estimation of material, Electrical & electronic symbol]*

4. Select and ascertain measuring instrument and measure dimension of components and record data.

5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.

6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.

7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.

8. Plan and organize the work related to the occupation.

# COMPUTER NETWORKING TECHNICIAN

### 6.2 SPECIFIC LEARNING OUTCOME

## Block – I

1. Safety and best practices (5S, KAIZEN etc.)
2. Record keeping and documentation
3. Identify and test the Computer devices/ components
4. Repair & Maintenance work
5. Install the Linux/Windows Operating System; configure server, adding user, Creating and managing user, effective access permission.
6. Create and manage the network shares, share permission, domain user account configuration, user account properties, domain groups, managing ports, installing and configuration of printer, scanner, disk management tools and tasks, implementing file and folders share permission, using device manager, drivers, signature verification.
7. Work and configure the various types of network devices like Ethernet cards, routers, manageable switches, HUB, gateways, firewalls, modems, connector and cables.
8. Make network cable by crimping the straight and cross CAT 5 cables and punching with IO Box, HUB/Switch and patch panel.
9. Configure a peer to peer network, data communication, connecting computers with network through cable and using Wi-Fi configuration.
10. Configure IP address (IP4/IP6) to IP routing, subnetting and supernetting the network, managing TCP/IP protocol.
11. Install & configure terminal services, managing server remotely using terminal services (remote desktop) backup restoring data installing DNS, networks installing & configuring DHCP, remote access & VPN configuring & implementing remote access server configuring.
12. Share resource and advance sharing setting, installing proxy server, installing and configuring internet connection on a PC using Broadband or Dongle.
13. Set up basic protection using public keys and MAC address filters. Integrate wired with wireless network. Power over Ethernet (PoE). Troubleshooting wired and wireless network.
14. Identify fault and Trouble shooting in different types of networks. Troubleshooting of network and its configuration and different types of cabling techniques. Working with hardware of servers and its configuration.
15. Set up the basic collaboration tool like NetMeeting for activities like chat, application sharing, remote desktop access and control, VoIP. Setup IP camera for basic surveillance scenario, logging and monitoring of devices / locations.
16. Practice on firewall technologies to secure the network perimeter, Practice LAN and Wi-Fi configuration to implement security considerations.

*NOTE: Learning outcomes are reflection of total competencies of a trainee and assessment will be carried out as per assessment criteria.*

# 7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

| GENERIC  LEARNING OUTCOME | |
|---|---|
| **LEARNING OUTCOMES** | **ASSESSMENT CRITERIA** |
| 1. Recognize & comply safe working practices, environment regulation and housekeeping. | 1. 1. Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements. |
| | 1. 2. Recognize and report all unsafe situations according to site policy. |
| | 1. 3. Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures. |
| | 1. 4. Identify, handle and store / dispose off dangerous/unsalvageable goods and substances according to site policy and procedures following safety regulations and requirements. |
| | 1. 5. Identify and observe site policies and procedures in regard to illness or accident. |
| | 1. 6. Identify safety alarms accurately. |
| | 1. 7. Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures. |
| | 1. 8. Identify and observe site evacuation procedures according to site policy. |
| | 1. 9. Identify Personal Productive Equipment (PPE) and use the same as per related working environment. |
| | 1. 10. Identify basic first aid and use them under different circumstances. |
| | 1. 11. Identify different fire extinguisher and use the same as per requirement. |
| | 1. 12. Identify environmental pollution & contribute to avoidance of same. |
| | 1. 13. Take opportunities to use energy and materials in an environmentally friendly manner |
| | 1. 14. Avoid waste and dispose waste as per procedure |
| | 1. 15. Recognize different components of 5S and apply the same in the working environment. |
| | |
| 2. Understand, explain different mathematical calculation & science in the field of study including basic electrical and | 2.1 Explain concept of basic science related to the field such as Material science, heat & temperature, motion, pressure, heat treatment, centre of gravity,. |

| | | |
|---|---|---|
| apply in day to day work.*[Different mathematical calculation Algebra, Geometry & Mensuration, Trigonometry, Heat & Temperature, concept of storage units, calculation hard disk capacity ,Use of Electricity, Types of current_ AC, DC, , voltage, resistance, types of connections - series, parallel, electric power, unit of electrical energy. Concept of earthling]* | 2.2 | Measure dimensions  as per drawing |
| | 2.3 | Use scale/ tapes to measure for fitting to specification. |
| | 2.4 | Comply given tolerance. |
| | 2.5 | Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials. |
| | 2.6 | Ensure dimensional accuracy of assembly by using different instruments/gauges. |
| | 2.7 | Explain basic electricity, insulation & earthing. |
| | | |
| 3.   Interpret   specifications, different engineering drawing and   apply   for   different application in the field of work. *[Different engineering drawing- Geometrical construction, Dimensioning, Free hand sketching of straight lines, dotted lines, chain lines, rectangles, square, circles, polygons etc, Diagram of a Hard disk, diagram of internal components and structure Block diagram of SMPS and diagram of various power connectors, Estimation of material, Electrical & electronic symbol]* | 3. 1. | Read & interpret the information on drawings and apply in executing practical work. |
| | 3. 2. | Read & analyse the specification to ascertain the material requirement, tools, and machining /assembly /maintenance parameters. |
| | 3. 3. | Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work. |
| | | |
| 4. Select and ascertain measuring instrument to detect fault or to perform electrical and electronic work. | 4.1 | Select appropriate measuring instruments such as digital ammeter, ohmmeter, multimeter, continuity tester, logic probe, network analyser, etc. (as per tool list). |
| | 4.2 | Ascertain the functionality & correctness of the instrument. |
| | 4.3 | Measure dimension of the components & record data to analyse the with given drawing/measurement. |
| | | |
| 5.   Explain   the   concept   in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality. | 5.1 | Explain the concept of productivity and quality tools and apply during execution of job. |
| | 5.2 | Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws. |
| | 5.3 | Knows benefits guaranteed under various acts |
| | | |

*COMPUTER NETWORKING TECHNICIAN*

| 6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources. | 6.1 Explain the concept of energy conservation, global warming, pollution and utilize the available recourses optimally & remain sensitive to avoid environment pollution. |
|---|---|
| | 6.2 Dispose waste following standard procedure. |

| 7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth. | 7. 1. Explain personnel finance and entrepreneurship. |
|---|---|
| | 7. 2. Explain role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme. |
| | 7. 3. Prepare Project report to become an entrepreneur for submission to financial institutions. |

| 8. Plan and organize the work related to the occupation. | 8. 1. Use documents, drawings and recognize hazards in the work site. |
|---|---|
| | 8. 2. Plan workplace/ assembly location with due consideration to operational stipulation |
| | 8. 3. Communicate effectively with others and plan project tasks |
| | 8. 4. Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same. |

## SPECIFIC OUTCOME

## **Block-I**

*Assessment Criteria i.e. the standard of performance, for each specific learning outcome mentioned under **Block – I**(section: 10) must ensure that the trainee works in familiar, predictable, routine, situation of clear choice. Assessment criteria should broadly cover the aspect of **Planning** (Identify, ascertain, etc.); **Execution** apply factual knowledge of field of knowledge, recall and demonstrate practical skill during performing the work in routine and repetitive in narrow range of application, using appropriate rule and tool, complying with basic arithmetic and algebraic principles and language to communicate in written or oral with required clarity; **Checking/ Testing** to ensure functionality during the assessment of each outcome. The assessments parameters must also ascertain that the candidate is responsible for his/her own work and learning.*

<u>**BASIC TRAINING (Block – I)**</u>

<u>**Duration: (03) Three Months**</u>

| Week No. | Professional Skills (Trade Practical) | Professional Knowledge (Trade Theory) |
|---|---|---|
| 1. | **Linux operating system**<br>- Installing UNIX / LINUX<br>- Preparing functional system UNIX/LINUX<br>- Adding new users, software, material components<br>- Making back-up copies of the index and files<br>- Dealing with the files and indexes | **Linux operating system**<br>- Basic Linux commands.<br>- Linux file system, The Shell, Users and file permissions, vi editor, X window system, Filter Commands, Processes, Shell Scripting. |
| 2. | **Components of the Computer Network.**<br>Familiarization with various Network devices, Connectors and Cables.<br>Understanding the Layout of network. | Introduction to Computer Networks – Advantages of Networking, Peer-to-Peer and Client/Server Network.<br>Network Topologies – Star, Ring, Bus, Tree, Mesh, Hybrid.<br>Type of Networks – Local Area Networks (LAN), Metropolitan Area Networks (MAN), Wide Area Networks (WAN) and Internet, Ethernet, Wi-Fi, Bluetooth, Mobile Networking, Wire and wireless Networking.<br>Difference between Intranet and Internet. |
| 3. | **Crimping & Punching**<br>Crimping practice with straight and cross CAT 5 cables.<br>Punching practice in IO Box and patch panel.<br>Crimping and making cables.<br>**Cabling**<br>Create cabling in a lab with HUB/Switch and IO Boxes and patch panel. Fitting Switch Rack. | Communication Media & Connectors – Unshielded twisted-pair (UTP), shielded twisted-pair (STP), Filber Optics and coaxial cable: RJ-45, RJ-11, BNC. Understanding color codes of CAT5 cable. 568A and 568B convention.<br><br>Introduction to Data Communication – Analog and Digital Signals, Simplex, Half-Duplex and Full-Duplex transmission mode. |
| 4. | **Install & configure a Network.**<br>Installing & Configuring a Peer-to-Peer Network using Windows Software.<br>Making cables by crimping.<br>Connect computers using Bluetooth. | OSI Model - The functions of different layers in OSI model |
| 5. | **Configuration of Data communication equipments.**<br>Connecting computers with Network with Drop cable and using Wi Fi | Network Components – Modems, Firewall, Hubs, Bridges, Routers, Gateways, Repeaters, Transceivers, Switches, Access point, etc. – their types, functions, advantages and applications. |

| | | |
|---|---|---|
| | configuration.<br>Basic Programmable switch<br>Configuration<br>Spanning Tree Protocol ( STP )<br>Command Line Interface<br>IP Routing Process<br>Verifying Configuration | IP Routing in Network RIP IGRP |
| 6. | **IP Addressing & TCP/IP**<br>IP Addressing technique(IP4/IP6) and<br>Subnetting and Supernetting the<br>network.<br>Installation and Configuration of<br>TCP/IP Protocol.<br>Practice TCP/IP Utilities : PING,<br>IPCONFIG, HOSTNAME, ROUTE,<br>TRACERT etc. | Protocols, TCP/IP, FTP, Telnet etc., Theory on<br>Setting IP Address(IP4/IP6) & Subnet Mask,<br>Classes of IP Addressing. |
| 7. | **Other Network Protocols**<br>Working with SMTP, TELNET, FTP,<br>HTTP, SNMP, LDAP etc.<br>Practice on configuring DHCP. | Simple Mail Transfer Protocol (SMTP),<br>Telnet, File Transfer Protocol (FTP),<br>Hyper Text Transfer Protocol (HTTP),<br>Simple Network Management Protocol<br>(SNMP). LDAP(Lightweight Directory Access<br>Protocol). Introduction to Network Security.<br>Concept of Dynamic Host Control Protocol. |
| 8. | **Sharing Resource & Internet<br>connection.**<br>Sharing Resource and Advance Sharing<br>Setting.<br>Installing Proxy Server.<br>Exposure and using Internet. Setting E-<br>mail accounts. Conferencing.<br>Installing and Configuring Internet<br>Connection on a PC using Broadband<br>or Dongle. | Concept of Internet. Architecture of Internet.<br>DNS Server. Internet Access Techniques, ISPs<br>and examples(Broadband/Dialup/Wifi).<br>Concept of Social Networking Sites, Video<br>Calling & Conferencing.<br>Concept of VIRUS and its Protection using Anti<br>Virus, UTM and Firewall. |
| 9. | **Network Protection and<br>troubleshooting.**<br>Setting up basic protection using public<br>keys and MAC address filters. Integrate<br>wired with wireless network. Power<br>over Ethernet(PoE). Troubleshooting<br>wired and wireless network. | Collaborating using wired and wireless networks,<br>Protecting a Network, Network performance<br>study and enhancement. |
| 10. | **Control & monitoring of network<br>devices.**<br>Setting up of basic collaboration tool<br>like NetMeeting for activities like chat,<br>application sharing, remote desktop<br>access and control, VoIP. Setup IP<br>camera for basic surveillance scenario, | Surveillance using network devices, collaboration<br>on network for team optimization and support<br>activities. Remote management of devices. |

|  | logging and monitoring of devices / locations. Use Linux Network Tools to check / maintain / Manage Network. | |
|---|---|---|
| 11. | **Install and configure Windows Server** Configure services like Active Directory, DNS and DHCP. Configuration of broadband modem and sharing internet connection. | Server concepts, Installation steps, configuration of server. Concept of Active Directory and DNS. Setting up of DHCP, Routing and remote access. |
| 12. | **Network Security** Practice on firewall technologies to secure the network perimeter. Practice LAN security considerations and implement endpoint and Layer 2 security features. Wi-fi configuration to implement security considerations. | Network Security Modern Network Security Threats and the basics of securing a network. Secure Administrative Access, LAN security considerations. Cryptography. Wi-fi security considerations. |
| 13 | **Revision & Internal Assessments** | |

**NOTE: -**

*More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures/videos of related industry operations may be shown to the trainees to give a feel of Industry and their future assignment.*

### 9.1 WORKSHOP CALCULATION SCIENCE & ENGINEERING DRAWING

| Topic No. | Engineering Drawing | Workshop Science & Calculation |
|---|---|---|
| 1. | Engineering Drawing: Introduction and its importance.<br>Different types of standards used in engineering drawing.<br>Drawing Instruments: their uses<br>Drawing board, T-Square, Drafter (Drafting M/c), Set Squares,<br>Protractor, Drawing Instrument Box (Compass, Dividers, Scale, Diagonal Scales etc.), Pencils of different Grades, Drawing pins / Clips. | Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).<br>Quadratic equation, Simultaneous linear equation in two variables.<br>Arithmetic and geometric progression, sum of n terms, simple calculations. |
| 2. | Free hand sketching of straight lines, dotted lines, chain lines, rectangles, square, circles, polygons etc.<br>Free hand sketching of tools, simple solids with dimensions.<br>Free hand sketch of solids viewed perpendicularly to their surface and axes. | Concept of storage units(bit, byte etc.), decimal to binary, binary to decimal, decimal to hexadecimal, hexadecimal to decimal.<br>Binary addition and subtraction. |
| 3. | Flow charts showing steps in sample programs.<br>Block diagram of personal computer, drawings of keyboard, monitor, mouse, FDD, HDD, CD ROM.<br>Front and Rear view of a PC. | Calculation of Hard disk capacity, Read/write time, latency time, seek time.<br>Definition of Scalar and Vector, notations.<br>Addition and subtraction of vectors. |
| 4. | Diagram of a Hard disk, diagram of internal components and structure.<br>Pin diagram and block diagram of RAM, ROM, EPROM, Dynamic ROM Chips.<br>Diagram of servo motor and stepper motor with external connections. | Specifications and Rating of SMPS. Power Good.<br>Interpersonal relationship and group behaviours. |
| 5. | Top view of a motherboard showing chip set and slots etc.<br>Diagram of different connectors, CPU sockets.<br>Front and Rear view of a Laptop PC. | Dynamic and Static RAM.<br>Quality control standard and institutions.<br>Calculation of the capacity of RAM. |
| 6. | Block diagram of SMPS and diagram of various power connectors. 3 d view of SMPS<br>Top view of a mother board showing chip set and slots etc Diagram of different connectors, CPU sockets. | Use of Electricity, Types of current_ AC, DC, their comparison, voltage, resistance, types of connections - series, parallel, electric power, unit of electrical energy. Concept of earthling. |

# COMPUTER NETWORKING TECHNICIAN

## 9.2 EMPLOYABILITY SKILLS

### (DURATION: - 110 HRS.)

| Block – I (Duration – 55 hrs.) | |
|---|---|
| **1. English Literacy** Duration : 20 Hrs. Marks : 09 | |
| **Pronunciation** | Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech) |
| **Functional Grammar** | Transformation of sentences, Voice change, Change of tense, Spellings. |
| **Reading** | Reading and understanding simple sentences about self, work and environment |
| **Writing** | Construction of simple sentences Writing simple English |
| **Speaking / Spoken English** | Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication. |
| **2. I.T. Literacy** Duration : 20 Hrs. Marks : 09 | |
| **Basics of Computer** | Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer. |
| **Computer Operating System** | Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications. |
| **Word processing and Worksheet** | Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document. Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets. |

## *COMPUTER NETWORKING TECHNICIAN*

| | |
|---|---|
| **Computer Networking and Internet** | Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks),<br>Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication.<br>Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes. |
| **3. Communication Skills**<br>Duration : 15 Hrs.                                                      Marks      : 07 | |
| Introduction to Communication Skills | Communication and its importance<br>Principles of Effective communication<br>Types of communication - verbal, non verbal, written, email, talking on phone.<br>Non verbal communication -characteristics, components-Para-language<br>Body language<br>Barriers to communication and dealing with barriers.<br>Handling nervousness/ discomfort. |
| Listening Skills | Listening-hearing and listening, effective listening, barriers      to effective  listening  guidelines for effective listening.<br>Triple- A Listening - Attitude, Attention & Adjustment.<br>Active Listening Skills. |
| Motivational Training | Characteristics Essential to Achieving Success.<br>The Power of Positive Attitude.<br>Self awareness<br>Importance of Commitment<br>Ethics and Values<br>Ways to Motivate Oneself<br>Personal Goal setting and Employability Planning. |
| Facing Interviews | Manners, Etiquettes, Dress code for an interview<br>Do's & Don'ts for an interview. |
| Behavioral Skills | Problem Solving<br>Confidence Building<br>Attitude |
| **4. Entrepreneurship Skills**<br>Duration  : 15 Hrs.                                                      Marks      : 06 | |
| **Concept of Entrepreneurship** | Entrepreneur  -  Entrepreneurship  - Enterprises:-Conceptual issue Entrepreneurship  vs.  management, Entrepreneurial motivation.<br>Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, |

| | Entrepreneurial opportunities, The process of setting up a business. |
|---|---|
| **Project Preparation & Marketing analysis** | Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of PLC, Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix. |
| **Institutions Support** | Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes& procedure & the available scheme. |
| **Investment Procurement** | Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes. |

**5. Productivity**
Duration : 10 Hrs.           Marks     : 05

| **Benefits** | Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard. |
|---|---|
| **Affecting Factors** | Skills, Working Aids, Automation, Environment, Motivation - How improves or slows down. |
| **Comparison with developed countries** | Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages. |
| **Personal Finance Management** | Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance. |

**6. Occupational Safety, Health and Environment Education**
Duration : 15 Hrs.           Marks     : 06

| **Safety & Health** | Introduction to Occupational Safety and Health importance of safety and health at workplace. |
|---|---|
| **Occupational Hazards** | Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention. |
| **Accident & safety** | Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures. |
| **First Aid** | Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person. |

| Basic Provisions | Idea of basic provision legislation of India. safety, health, welfare under legislative of India. |
|---|---|
| Ecosystem | Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance. |
| Pollution | Pollution and pollutants including liquid, gaseous, solid and hazardous waste. |
| Energy Conservation | Conservation of Energy, re-use and recycle. |
| Global warming | Global warming, climate change and Ozone layer depletion. |
| Ground Water | Hydrological cycle, ground and surface water, Conservation and Harvesting of water. |
| Environment | Right attitude towards environment, Maintenance of in -house environment. |

**7. Labour Welfare Legislation**
Duration : 05 Hrs.                                                                                     Marks     : 03

| Welfare Acts | Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act. |
|---|---|

**8. Quality Tools**
Duration : 10 Hrs.                                                                                     Marks     : 05

| Quality Consciousness | Meaning of quality, Quality characteristic. |
|---|---|
| Quality Circles | Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles. |
| Quality Management System | Idea of ISO 9000 and BIS systems and its importance in maintaining qualities. |
| House Keeping | Purpose of House-keeping, Practice of good Housekeeping. |
| Quality Tools | Basic quality tools with a few examples. |

# 10. DETAILS OF COMPETENCIES (ON-JOBTRAINING)

The **competencies/ specific outcomes** on completion of On-Job Training are detailed below: -

**Block – I**

1. Safety and best practices (5S, KAIZEN etc.)
2. Record keeping and documentation
3. Identify and test the Computer devices/ components
4. Repair & Maintenance work
5. Install the Linux/Windows Operating System; configure server, adding user, Creating and managing user, effective access permission.
6. Create and manage the network shares, share permission, domain user account configuration, user account properties, domain groups, managing ports, installing and configuration of printer, scanner, disk management tools and tasks, implementing file and folders share permission, using device manager, drivers, signature verification.
7. Work and configure the various types of network devices like Ethernet cards, routers, manageable switches, HUB, gateways, firewalls, modems, connector and cables.
8. Make network cable by crimping the straight and cross CAT 5 cables and punching with IO Box, HUB/Switch and patch panel.
9. Configure a peer to peer network, data communication, connecting computers with network through cable and using Wi-Fi configuration.
10. Configure IP address (IP4/IP6) to IP routing, subnetting and supernetting the network, managing TCP/IP protocol.
11. Install & configure terminal services, managing server remotely using terminal services (remote desktop) backup restoring data installing DNS, networks installing & configuring DHCP, remote access & VPN configuring & implementing remote access server configuring.
12. Share resource and advance sharing setting, installing proxy server, installing and configuring internet connection on a PC using Broadband or Dongle.
13. Set up basic protection using public keys and MAC address filters. Integrate wired with wireless network. Power over Ethernet (PoE). Troubleshooting wired and wireless network.
14. Identify fault and Trouble shooting in different types of networks. Troubleshooting of network and its configuration and different types of cabling techniques. Working with hardware of servers and its configuration.

*COMPUTER NETWORKING TECHNICIAN*

15. Set up the basic collaboration tool like NetMeeting for activities like chat, application sharing, remote desktop access and control, VoIP. Setup IP camera for basic surveillance scenario, logging and monitoring of devices / locations.

16. Practice on firewall technologies to secure the network perimeter, Practice LAN and Wi-Fi configuration to implement security considerations.

**Note:**

1. Industry must ensure that above mentioned competencies are achieved by the trainees during their on job training.

2. In addition to above competencies/ outcomes industry may impart additional training relevant to the specific industry.

## INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

| COMPUTER NETWORKING TECHNICIAN | | | |
|---|---|---|---|
| **LIST OF TOOLS AND EQUIPMENT for Basic Training (For 20 Apprentices)** | | | |
| **A. TRAINEES TOOL KIT** | | | |
| **Sl. no.** | **Name of the Tool &Equipments** | **Specification** | **Quantity** |
| 1 | Connecting screwdriver | 100 mm | 21 nos. |
| 2 | Neon tester | 500 V | 21 nos. |
| 3 | Screw driver set (set of 5 ) | | 21 nos. |
| 4 | Insulated combination pliers | 150 mm | 21 nos. |
| 5 | Insulated side cutting pliers | 150 mm | 2 1 nos. |
| 6 | Long nose pliers | 150 mm | 21 nos. |
| 7 | Soldering iron | 25 W. 240 V. | 21 nos. |
| 8 | Electrician knife | | 21 nos. |
| 9 | Tweezers | 100mm | 21 nos. |
| 10 | Digital Multimeter | | 21 nos. |
| 11 | Soldering Iron Changeable bits | 15 W | 21 nos. |
| 12 | De- soldering pump | | 21 nos. |
| **B. SHOP OUTFIT TOOLS** | | | |
| 1. | Crimping tool (pliers) | | 2 Nos. |
| 2. | Soldering Iron | 25W | 6 Nos. |
| 3. | Magneto spanner set | | 2 Nos. |
| 4. | Screw driver | 150mm | 4 Nos. |
| 5. | Steel rule | 150mm | 2 Nos. |
| 6. | Scriber straight | 150mm | 2 Nos. |
| 7. | Soldering Iron | 240W | 1 Nos. |
| 8. | Allen key set (set of 9) | | 2 Nos. |
| 9. | Tubular box spanner (set of 6nos) | | 1 No |
| 10. | Magnifying lenses | 75mm | 3 Nos. |
| 11. | Continuity tester | | 6 Nos. |
| 12. | Soldering iron | 10W | 6 Nos. |
| 13. | Cold chisel | 20mm | 1 No. |
| 14. | Scissors | 200mm | 1 No. |
| 15. | Handsaw | 450mm | 1 No. |
| **C. TOOLS FOR INSTALLATION AND MAINTENANCE** | | | |
| 1 | Server Computer | | 01 no |
| 3 | Desktop Computer | | 10 nos |
| 4 | Laptop, Notebook | | 01 each |
| 5 | Intel Mobile Desktop based PC with LCD monitor | | 01 no |
| 6 | Printers: Laserjet, deskjet, passbook, mfd | | 01 each |
| 7 | Network Printer | | 01 no |
| 9 | 5KVA online UPS | | 02 nos |
| 10 | LAN Cards, Wi-fi LAN Cards | | 06 nos each. |
| 11 | LCD/DLP Projector | | 01 no |

*COMPUTER NETWORKING TECHNICIAN*

| 12 | Power Meter | 02 nos |
|---|---|---|
| 13 | Crimping Tools | 06 nos |
| 14 | Computer Toolkits | 06 Nos. |
| 15 | Computer Spares: | As required |
| 16 | Motherboards (of different make) | 4 nos |
| 17 | Cabinets | 4 nos |
| 18 | Processors (of different make) | 4 nos |
| 19 | Hard Disk (500 GB or better) | 4 nos |
| 20 | Optical Drives | 4 nos |
| 21 | LCD/LED Monitors | 2 nos |
| 22 | Pen Drives | 4 nos |
| 23 | External Hard disk | 2 nos |
| 24 | External DVD Writer | 2 nos |
| 25 | Keyboards | 4 nos |
| 26 | Mouse | 4 nos |
| 27 | Anti static pads | 4 nos |
| 28 | Anti static wrist wraps | 4 nos |
| 29 | SMPS | 4 nos |
| 30 | Digital Multimeters | 10 nos |
| 31 | Blu-Ray drive and player | 2 nos |
| 32 | External Hard Disk | 2 nos |
| 34 | Digital Camera | 2 nos |
| 35 | HD Display | 2 nos |
| 36 | Network storage | 2 nos |
| 37 | Card Reader | 2 nos |
| 38 | Game video card | 2 nos |
| 39 | Web Cam | 2 nos |
| 40 | Surround sound speakers | 2 nos |
| 42 | Different types of memory cards | 2 nos each |
| 43 | Laptop kits | 12 nos |
| 44 | Laptop spares: Cabinet with display, memory, hard disk, battery pack, keyboard membrane, chargers | As required |
| 47 | SMPS Trainer kit | 2 nos |
| 48 | UPS Trainer kit | 2 nos |
| 49 | Power electronics Trainer kit | 2 nos |
| 50 | Post error debugging card | 4 Nos |
| 51 | SMPS Tester | 4 Nos. |
| 52 | PCI slot Testing tool | 4 Nos. |

**D. SOFTWARE**

| 1 | Windows Server Operating System | 2 licenses |
|---|---|---|
| 2 | Windows Operating System | 2 licenses |
| 3 | Linux Operating System | 2 nos. |
| 4 | Network Management Software | 01 No. |
| 5 | MS Office | 2 nos |
| 6 | Anti virus software | 2 nos |
| 7 | Data recovery software | 2 nos |

**E. FURNITURE and Other Equipments**

| 1 | Computer Tables | 10 nos |
|---|---|---|
| 2 | Computer Chairs | 20 nos |
| 3 | Printer Table | 1 no |
| 4 | Class room chairs | 20 nos |
| 5 | Air conditioners (optional) | 2 nos |

*COMPUTER NETWORKING TECHNICIAN*

| 6 | Scanner | 1 no |
|---|---|---|
| 7 | Modem | 1 no |
| 8 | Telephone Line | 1 no |
| 9 | Broadband Internet connection | 1 no |
| 10 | Fire fighting equipments | As required |
| 11 | Hardware and Network Trainer Kit | 6 nos |

**F. HARDWARE**

| 1. | Wireless Network Adapter | 10 nos |
|---|---|---|
| 2. | Wireless Access Point | 6 nos |
| 3. | Router | 6 nos |
| 4. | Managed Layer 2 Ethernet Switch 24 port | 2 nos |
| 5. | Managed Layer 3 Ethernet Switch 24 port | 2 nos |
| 6. | Network Training System | 2 nos |
| 7. | LAN Protocol Simulation and Analyser Software | 2 nos |
| 8. | Network and Internet security trainer | 2 nos |
| 9. | LAN cable tester | 2 nos |
| 10. | Network cables - UTP | As required |
| 11. | Network Cables - coaxial, flat, ribbon | As required |
| 12. | LAN Cards, wi-fi LAN Card | 05 nos each |
| 13. | Connectors for cables | As required |
| 14. | Power Meter | 2 nos |
| 15. | Media Convertor | 4 each |
| 16. | 24 port UTP jack panel | 2 nos |
| 17. | SC Couplers | 12 nos |
| 18. | SC Pigtails | 12 nos |
| 19. | RJ-45 connector | As required |
| 20. | Fluke Meter | 2 nos |
| 21. | Crimping Tools | 6 nos |
| 22. | Switch with POE ports | 2 nos |
| 23. | POE adapters | 2 nos |
| 24. | Network Camera (Outdoor / Indoor) | 2 no each |

**G. RAW MATERIALS**

| 1. | White Board Marker | 1 Dozens |
|---|---|---|
| 2. | Duster Cloth(2' by 2') | 20 Pcs |
| 3. | Cleaning Liquid 500 ml | 2 Bottles |
| 4. | Xerox Paper (A4) | As required |
| 5. | Full Scape Paper (White) | 1 reams |
| 6. | PCB, solder flux etc & electronic components | As required |
| 7. | Wires, cables Plug sockets switches of various types and other consumables | As required |
| 8. | Resistors, Capacitors, Inductors, Diodes, LED, Transistors, Thyristors, ICs etc. | As required |
| 9. | Spare Transformers and power devices required for servicing SMPS | As required |
| 10. | Various types of Button Cells | As required |
| 11. | Dry Cell | As required |
| 12. | Hand Brush | As required |
| 13. | Silicon grease | As required |
| 14. | Heat sink agent | As required |
| 15. | RAM 512 MB | As required |
| 16. | Cartridges for printer | As required |
| 17. | Optical Mouse P/S2 or USB | As required |
| 18. | P/S2 OR USB Key Board | As required |
| 19. | SMPS | As required |
| 20. | CMOS Battery | As required |

*COMPUTER NETWORKING TECHNICIAN*

| 21. | 3 Pin Power Chord | As required |
|---|---|---|
| 22. | Cat 5/5e/6 cable | 300 meters |
| 23. | Flat Cable | 100 meters |
| 24. | Stapler Small | 2 pcs |
| 25. | Stapler Big | 1 pcs |
| 26. | AAA battery for remote | As required |
| 27. | AA battery for clock | As required |
| 28. | 8 GB pen drives | 4 Nos |
| 29. | CDs | 20 Nos |
| 30. | DVDs | 10 Nos. |
| 31. | Wall Clock | 1 pcs |
| 32. | Anti static pads | As required |
| 33. | Anti static wrist wraps | As required |
| 34. | Soldering wire and paste | As required |
| 35. | RJ - 45 Connector | As required |
| 36. | Telephone cable | As required |
| 37. | Co-axial cable | As required |
| 38. | RJ-11 connector | As required |
| 39. | BNC connector, T connector, terminator | As required |
| 40. | Keystone jack | As required |
| 41. | Patch / Jack Panel | As required |
| 42. | Patch / Mounting cord | As required |
| 43. | RJ-45 Info outlet with faceplate | As required |
| 44. | RJ-45 I/O Box | As required |
| 45. | RJ - 45 Cable extender | As required |
| 46. | 8-port HUB | 04 Nos. |
| 47. | LAN Card | 04 Nos. |
| 48. | Wi-fi LAN Card both PCI and USB | 02 Nos.each |

*COMPUTER NETWORKING TECHNICIAN*

INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND
ENGINEERING DRAWING

**TRADE:  COMPUTER NETWORKING TECHNICIAN**

**LIST OF TOOLS& EQUIPMENTS FOR -20APPRENTICES**

1) **Space Norms**                    : 45 Sq. m.(For Engineering Drawing)

2) **Infrastructure:**

| Sl. No. | Name of the items | Specification | Quantity |
|---|---|---|---|
| **A : TRAINEES TOOL KIT:-** | | | |
| 1. | Draughtsman drawing instrument box | | 20+1 set |
| 2. | Set square celluloid $45^0$ (250 X 1.5 mm) | | 20+1 set |
| 3. | Set square celluloid $30^0$-$60^0$ (250 X 1.5 mm) | | 20+1 set |
| 4. | Mini drafter | | 20+1 set |
| 5. | Drawing board (700mm x500 mm) IS: 1444 | | 20+1 set |
| **B : Furniture Required** | | | |
| 1 | Drawing Board | | 20 |
| 2 | Models : Solid & cut section | | as required |
| 3 | Drawing Table for trainees | | as required |
| 4 | Stool for trainees | | as required |
| 5 | Cupboard (big) | | 01 |
| 6 | White Board (size: 8ft. x 4ft.) | | 01 |
| 7 | Trainer's Table | | 01 |
| 8 | Trainer's Chair | | 01 |

| Sl. No. | Name of the Equipment | Quantity |
|---|---|---|
| **TOOLS & EQUIPMENTS FOR EMPLOYABILITY SKILLS** | | |
| 1. | Computer (PC) with latest configurations and Internet connection with standard operating system and standard word processor and worksheet software | 10 Nos. |
| 2. | UPS - 500VA | 10 Nos. |
| 3. | Scanner cum Printer | 1 No. |
| 4. | Computer Tables | 10 Nos. |
| 5. | Computer Chairs | 20 Nos. |
| 6. | LCD Projector | 1 No. |
| 7. | White Board 1200mm x 900mm | 1 No. |

*Note: - Above Tools & Equipments not required, if Computer LAB is available in the institute.*

## FORMAT FOR INTERNAL ASSESSMENT

| Name & Address of the Assessor : | | Year of Enrollment : |
|---|---|---|
| Name & Address of ITI (Govt./Pvt.) : | | Date of Assessment : |
| Name & Address of the Industry : | | Assessment location: Industry / ITI |
| Trade Name : | Semester: | Duration of the Trade/course: |

Learning Outcome:

| Sl. No | Candidate Name | Father's/Mother's Name | Safety consciousness | Workplace hygiene | Attendance/ Punctuality | Ability to follow Manuals/ Written instructions | Application of Knowledge | Skills to handle tools & equipment | Economical use of materials | Speed in doing work | Quality in workmanship | VIVA | Total internal assessment Marks | Result (Y/N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Maximum Marks (Total 100 Marks) | | 15 | 5 | 10 | 5 | 10 | 10 | 5 | 10 | 15 | 15 | | |
| 1 | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | |