Syllabus

For the trade of

NETWORK TECHNICIAN

Under CTS

Revised in

~~2010~~ 2011

Government of India
Ministry of Labour and Employment (D.G.E.&T.)
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
EN – Block, Sector – V, Salt Lake,
Kolkata-700091.

List of members attended the Trade Committee Meeting to revise the Syllabus for the Trade of "NETWORK TECHNICIAN" under CTS held on 26th February'2010 at I.T.I. Peenya, Bangalore

SL NO	NAME & DESIGNATION S/SHRI	REPRESENTING ORGANIZATION	REMARKS
1	S / Shri S.D. Lahiri, Director	Central Staff Training Research Institute, Kolkata	Chairman
2	M.N.Renukardhya, Principal	Govt. I.T.I. , Peenya Bangalore	Member
3	B. Manoj, Asst. Manager, Planning Department	Bharat Earth Movers Ltd. Bangalore	Member
4	G.Kalyanasundaram, Admn. Officer (HRD)	Bharat Heavy Electricals Ltd. Bangalore	Member
5	Raghunath H.N., Engineer – IT & S	Bharat Heavy Electricals Ltd. Bangalore	Member
6	G.R.Ramanth, General Manager (HR)	Ace Designers Ltd.,Bangalore	Member
7	Jagannatha, Dy. General Manager (Trg.)	Hindustan Aeronautics Ltd., Bangalore	Member
8	N.K.Ramanamurthy	Hindustan Aeronautics Ltd., Bangalore	Member
9	M.A.Ramanujam, Addl. General Manager (HRD)	Bharat Electronics Ltd. Bangalore	Member
10	D.U.Krishna Rao, Sr. Dy. General Manager (HRD)	Bharat Electronics Ltd. Bangalore	Member
11	Dhananjaya. L, Asstt. Executive Engineer	Karanataka Power Transmission Corpn. Ltd., Bangalore	Member
12	Ratnakar Shetty, Dy. General Manager (HR)	Kenna Metal, Bangalore	Member
13	B.Sudhakar, Addl. General Manager (HRD)	HMT Ltd., Bangalore	Member
14	Neelakanta. V, Instructor	HMT Ltd.Training Institute, Bangalore	Member
15	V. Babu, Asstt. Director of Trg.	Apex Hi-Tech Institute, Bangalore	Member
16	R.N.Manna, Training Officer	Central Staff Training Research Institute, Kolkata	Member
17	Mrs. Sandhya Hende, Training Officer	Govt. I.T.I. , Peenya Bangalore	Member
18	Lokesh. V, Training Officer	Govt. I.T.I. , Peenya Bangalore	Member
19	Mrs. Maheswari. V. S, Training Officer	Govt. I.T.I. , Peenya Bangalore	Member
20	Mrs. Hemlatha. R, Training Officer	Govt. I.T.I. , Peenya Bangalore	Member
21	Mrs. Laxmi Shetty, Training Officer	Govt. I.T.I. , Peenya Bangalore	Member

GENERAL INFORMATION

1. Name of the course :	Network Technician
2. N. C. O. Code No. :	
3. Duration of Craftsmen Training :	06 Months
4. Entry Qualification :	12th Std. Passed under 10+2 System of education or its equivalent.
5. Unit strength :	20 Trainees
6. Space Requirement :	3.5 Sq. m per Trainee.
7. Power Requirement :	5 KW
8. Qualification for Instructor :	**Academic** – 10^{th} Class pass or equivqlent **Technical** – (i) Degree in Engineering from recognised university or Three year Diploma from recognised Board / Institution in appropriate branch of trade concerned or National Apprenticeship Certificate or National Trade certificate in relevant trade **Experience** – One year for Degree holders, Two years for Diploma holders and Three years for NAC / NTC holders **Desirable** – Passed Principle of Teaching (POT) course from any of DGET Institute

Syllabus for the trade of "Network Technician" Under Craftsmen Training Scheme

Duration: Six Months

Week No.	Practical	Theory
1	Visit to different sections of the Institute. Safety precautions, Electrical Safety. Demonstration and operation of Fire Extinguishers. Demonstration of Artificial Respiration. First Aid :- **Safety and occupational health:** Effects of Cramped room and ill-light working environment. Effects of imProper sitting posture. Effects of im Proper lifting of posture of Heavy Components. Electric shock for the user due to electrical problem. **Software and Hardware security** Password, Locked Room, Sealed PC, User last Modified. **Environment:** Pollution of environment due to e-waste. Waste recovery facility through inter industry exchange. Removing Dust particles on the keyboard and other components.	Familiarisation with the Institute. Accidents, Safety precautions, Electrical safety. Types of fire extinguishers. Artificial Respiration. **First Aid** Reason for Electrical Shock Software and Hardware security. Problems due to dust particles dust accumulation. Human and Network safety during environment disasters. Global warming, Pollution of environment due to e-waste Our part to reduce Pollution: Recycling of e-waste, proper disposing of printer cartage and e-waste, saving electricity, using re-writable memory storage devices
2	Visit to establishments with general purpose and special purpose computers. Visit to Computer centers installed with Mini and Micro computers. Familiarisation with different type of Computers. Type of applications, operating systems, Software use in the establishments. CMOS Setup, HDD Types, IRQ, Boot sequence, Passwords-User and Supervisor	Basic definition of computer, features and applications, hardware, software, firmware and live ware. Data, Information, data types, physical & logical concepts of data. Representation of information inside a computer - Bit, byte, kilobyte, megabyte and gigabyte. Generation of Computers – Classification of computers according to purpose (general and special purpose), according to working (analog, digital and hybrid), according to processing capability (Super, mainframe, mini, micro, laptop and palmtop). Concept of Blue Tooth. Data processing – Different types of data processing like centralized, Decentralized & Distributed Data Processing, Server,

		Different types of servers
3	Identification of different peripheral devices. Practice of soldering. Connecting and dismantling cords, cables and peripheral devices. Identifying and handling of different types of Latest removable storage devices and CDs/DVDs . Understanding the keys and their functions in keyboard. Keyboard operation and practicing mouse. Connecting different types of Peripherals devices like Scanner , Web cam, Joysticks, Light Pen, Thumb drive, Card Reader, External Hard disk, External Cd-Rom , Speakers, Microphone, Headphone, Installing different types of printers	Block diagram of a Computer system. Standard and common input/output devices. Processing unit – CPU, ALU, CU Memory unit – Primary and Secondary memory. Concept of Virtual memory. Semiconductor memories such as RAM, ROM, PROM, EPROM, EEPROM. Dynamic and Static RAM. L1 and L2, L3 Cache Memories. Buses – Control bus, Address bus and Data bus. Secondary storage devices – magnetic tapes, Latest removable storage devices, hard disk, CDs and DVDs. Speakers, VGA Cards, USB-Ports.
4	Booting the computer under DOS and Windows. Using different computer peripherals. Self-test for different Printers. Keyboard and mouse practice.	Computer peripherals – Different type of printers, scanners, mouse, cameras, bar code readers etc. Different types of printers, Light-Pen, Head-phones, Power On Self Test (POST). Booting – booting sequence, cold booting and warm booting. Booting files and their functions. Concept of LILO boot. Storage & retrieval of data – concept of tracks, sectors, blocks, cylinders, boot record, disk partitions, Master Boot Record (MBR and File Allocation Tables (FAT and NTFS). BIOS Set-up. Types of software – system software & application software. High-level Language, Low-Level Language. Functions of operating system, interpreter, compiler and assembler. History of Computers.
5	Introduction to Windows – The user Interface, Using Mouse, Status Bar, Start, Menus, Running Applications, My Computer, Recycle Bin, Windows Explorer, Creating, Renaming, Copying & Moving files and folders ICONS . Using Help. Windows Settings – Control Panel, Setting Wall paper, Mouse setting, Screen Savers, Date, Time, Sounds, Task bar and Start Menu. Using right mouse button. User accounts, Providing Pass-word, Language setting, Printer and Fax, Different type of Fonts setting.	MS Windows –Starting windows and their operations. File management through Windows explorer. Display properties, sound properties, different screen savers, Themes & Desktop setting using password, and font management. Installation of programs. Setting, using and applications of control panel.

6	Advanced Windows – Creating shortcuts & folders. Using Accessories, Adding & Removing Components of Windows. Practice of Basic DOS commands for File/Directory manipulations, Cut, Copying, Paste and Moving and File/Directory manipulations. Delete directory, and Protect and unprotect a file. Hide and Un-hide a file. Rename File and Folders, Creating New Folders and naming the Folders, System Tools like Disk Defragment, Disk Cleanup, Back up file etc.,	Applications of essential accessories - such as notepad, WordPad, paintbrush, images, calculator, calendar, media players and sounds. Multimedia. System Tools Basic DOS – Comparison of DOS & Windows, Switching between DOS & Windows. Basic DOS commands for File/Directory manipulations, Copying of Files & Disks, Delete/Undelete. Difference between DOS ,Windows, LINUX
7	Motherboard – Study of different Buses, Processor sockets and RAM sockets on Motherboards. Identification of different types of RAM and their sockets. Programming and resetting CMOS and making front panel connections. Replacing BIOS and battery. Identification of different types of RAM and their sockets. Installing and extending RAM. PXE booting / Remote booting. Trouble shooting the System, Up gradation	Computer hardware – Different type of Motherboards, on-board features, form factors. Different type of Buses – ISA, EISA, VESA, MCA and PCI. Different type of Processors, sockets, RAMs their features, capacities, frequency and advantages. Functions of I/O Ports and Motherboard BIOS. Up gradation of the present system.
8	Expansion Cards - Identification, checking and installing of AGP and different expansion cards commonly used. Installation and checking of Network Interface Card (NIC). Hard Disks and CD / DVD Drives. Partitioning and formatting of Hard Disks. Master/Slave configuration of Hard disks and CD / DVD Drives.	Function and features of different add on cards, Display cards, AGP and NIC. Different types of Hard Disks and CD / DVD Drives and their connections. DOS - different versions, advantages, features and applications. Windows - different versions, advantages, features and applications of windows.
9	Installation of Operating Systems – DOS, Windows XP / Vista / 7 or any other latest version and Unix/Linux. Installation of Network Operating system and basic network configuration. Identification of Network Topologies, network devices, types of protocols used , types and network media used.	Network operating system (NOS) and network operating system and features. Difference between Desktop Operating System and NOS. Introduction to Computer Networks – Advantages of Networking, Peer-to-Peer and Client/Server Network. Network Topologies – Star, Ring, Bus, Tree, Mesh, Hybrid. Type of Networks – Local Area Networks (LAN), Metropolitan Area Networks (MAN),

		Wide Area Networks (WAN) and Internet, Wthernet, Wi-Fi, Mobile Networking, Wire and wireless Networking. Diffreence between Intranet and Internet.
10 to 11	Installing & Configuring a Peer-to-Peer Network using Windows Software. Making cables by crimping. Network Connectivity tester Hand Tools for Network Installation	Communication Media & Connectors – Unshielded twisted-pair (UTP), shielded twisted-pair (STP) and coaxial cable: RJ-45, RJ-11, BNC. Crimping and making cables. Crimping Tool.
12	Installing & Configuring Windows 2003 / latest Server.	Introduction to Data Communication – Analog and Digital Signals, Simplex, Half-Duplex and Full-Duplex transmission mode. Working of Network using Telephone cable system, Working of Telephone exchange, Satellite Communication
13	Installing & Configuring Novell Netware Server.	Network Components – Modems, Hubs, Bridges, Routers, Gateways, Repeaters, Transceivers, Switches, Access point, etc. – their functions, advantages and applications.
14	Structured cabling and using I/O Box. Setting up Nodes.	OSI Model - The functions of different layers in OSI model
15 to 16	Physically connecting and running the Network. Troubleshooting the Network.	Data transmission in the OSI Model. Protocols IPX/SPX. Troubleshooting and Repairing the Network.
17 to 18	Configuring Print Server. Network Administration Functions. Identification and using the Network components. Cascading Hubs.	Ethernet operation. Ethernet characteristics. Ethernet cabling and components – Thick Net, Thin Net and 10 Base T. Limitations and Advantages of Ethernet. 10 G Network. Ethernet. FAST ETHERNET, GIGABIT ETHERNET, Auto Negotiation Difference between hub and switch Difference between switch and router Difference between L2 and L3 switch Basic L3 and Advanced Layer 3 switch Routing Protocols (RIP, BGP) VLAN
19	Exposure and using Internet.	Internet – Architecture and History. The

	Exposure and using Intranet.	Internet Architecture Board. Various Applications of Internet. Difference between Intranet And Internet. Virus, Virus affecting through Internet. Anti Virus , Hacking, Data privacy, Encoding and Decoding information, Fire wall protection.
20	Installing and Configuring Internet Connection on a PC using PSTN. Installing and Configuring Internet Connection on a PC using ISDN. Installing Proxy Server. Setting E-mail accounts. Broad Connection setup, Internet sharing wizard, Establish a modem-modem network	TCP Transmission Policy, and Congestion Control. TCP/IP Reference Model – Different layers and their functions. Comparison of the OSI and TCP Reference Models. Simple Mail Transfer Protocol (SMTP), Telnet, File Transfer Protocol (FTP), Hyper Text Transfer Protocol (HTTP), Simple Network Management Protocol (SNMP).
21	Installation, multiboot setup, configures networking, share resources and access. Integrating windows and Linux environments with Samba Server.	Linux OS Windows vs. Open Source Overview of Linux OS, Shell Commands, Installation and configuration, Configuring network on Linux boxes.
22	Setup a simple WAN, Setup routing, Visit to established WAN setup/establishment.	Network WAN Infrastructure Introduction to WAN environment and features, Network component used, Transmission technologies, Voice over data services.
23.	Configuring and use of Network Management and Unified Threat Management devices/ software.	Network Management and Security Network infrastructure management concepts, security loopholes, patches and their use.
24.	Setting up of 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.	Practical uses of Network File, print and internet sharing, premise security, surveillance using network devices, collaboration on network for team optimization and support activities. Remote management of servers / devices.
25	**Revision**	

Note : Syllabus for the subject of Social Studies is common for all the trades.

LIST OF TOOLS & EQUIPMENTS FOR NETWORK TECHNICIAN
(For a batch of 20 Trainees)

Sl. No.	Item Name, Description & Specification	Quantity
	HARDWARE	
1	Core 2 Duo, 2.16 GHz, 2 GB RAM, 160 GB SATA, CD/DVD RW±, Ethernet Cord 10 / 100 / 1000 MBPS, 15 " Monitor, 128 MB Integrated Graphics, Mouse and Internet keyboard or Higher.	21 nos.
2	Network Terminator (NT1)	1 No.
3	Terminal Adapter (TA)	1 no.
4	Laser Printer (One should be Network Printer)	2 nos.
5	Inkjet Printer (Multifunctional)	1 no.
6	Different Expansion Cards	1 each
7	16 port Hub + 8 port Hub	1 no each
8	UPS 5 KVA On line	1 no.
9	Air Conditioner 1.5 tonne.	2 nos.
10	Modem (Internal & External)	2 nos. each
11	ISDN line (For Internet) / Broad Band	1 no.
12	Telephone Line	1 no.
13	CD / DVD Writer	2 nos.
14	Network Interface Card (Ethernet Card 10/100/1000 Mbps)	4 nos
15	Fire extinguisher	1 no.
16	Vacuum Cleaner	1 no.
17	LCD / DLP projector	1 no.
	SOFTWARE	
1	Netware Software with minimum 20 User license (Latest version)	1 no.
2	Microsoft Windows 2003 Server with minimum 20 User license or Latest	1 no.
3	Windows (XP / Vista / 7) or Latest (20 User license)	1 no.
4	DOS 6.22 or Latest	1 no.
5	Simulation Software e.g. Packet Tracer	3 nos.
	FURNITURE	
1	Computer Tables with Chairs/stools	21 nos.
2	Printer Tables	03 nos.
3	Instructor Table	01 no.
4	Instructor's Chair	01 no.
5	Cabinet with drawer	02 nos.
6	Students Lockers (steel) unit of 8 lockers	03 nos.
7	Steel Almirah big size	01 no.
8	Steel Almirah small size	02 nos.
9	Class room chairs with writing pad molded type	20 nos.
10	4-Unit Rack for installation of Patch Panel, Hubs etc.	2 nos.
	STUDENTS TOOL KIT	
1	Screwdriver Set of min. 5 bits (Combination of star & minus) + 1 ext. rod	01 no. each
2	Crimping Tool for BNC and RJ-45 connectors	01 no. each
3	Punching Tool	01 no. each

Note : Some of Course Related CBTs may be purchased (Optional)