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

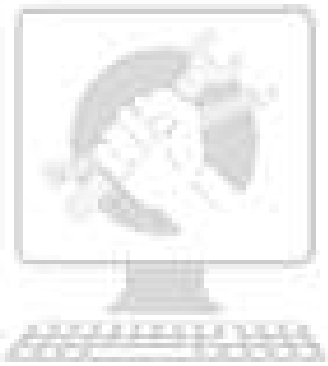
COMPETENCY BASED CURRICULUM

Advanced Diploma (Vocational)

IT, NETWORKING AND CLOUD

Sector – IT & ITeS

IT, NETW



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1. COURSE INFORMATION

In this Advanced Diploma (Vocational)in IT, Networking and Cloud,the trainee is trained on **Five Core modules**each of 320 hours duration in first year. Each Core module contains professional skill &professional knowledge. In addition to this, the trainee is entrusted with the project work and extracurricular activities to build up confidence. In second year there are three electives where trainee has to select any of two elective modules, each module containing 320 hours duration with total duration of 640 hours. The trainee will be trained Industry for 800 hours (as a part of on-the-job training). There will be a common subject for all Diploma courses on **Employability Skills** which will be for 160 hours in second year. The modulewise course coverage is categorized as below: -

Core Module 1 (Computer Hardware Maintenance): In this module the trainee will learn

- Safety on handling hand tools
- Disassemble and assemble Personal Computer (PC)
- Troubleshoot Input and Output devices of PC,
- Using cables and connectors effectively.
- Install operating systems Windows and Linux
- Manage files effectively in Windows and Linux environment.
- Create document, spread sheets and make presentations using open office.
- Customize PC in Windows and Linux environment.
- Will manage Device manager and Task manager in Window/Linux environment
- Secure PC with antivirus, maintain Hardware components of PC.

Core Module 2 (Computer Networking): In this module the trainee will learn

- Basic computer network technology
- Data Communications System and its components
- Types of network topologies and protocols.
- Enumerate the layers of the OSI model and TCP/IP
- Explain the function(s) of each layer.

- Identify the different types of network devices and their functions within a network
- Understand and build the skills of sub netting and routing mechanisms.
- Understand the basic protocols of computer networks, and how they can be used to assist in network design and implementation.
- Understand Client server concepts.

Core Module 3 (Web Designing) : In this module the trainee will learn

- How to create simple web pages using HTML 5
- Create Styles of web pages using CSS
- Create own account in cloud and launch and track no. of visitors
- Host in Amazon web server
- Embedded database with different web pages using Mongo DB
- Design and develop dynamic websites with PHP
- Make websites, web servers, game frameworks, desktop and CLI (Command Language Interpreter) applications, and IDE using Python.

Core Module 4 (Web Development): In this module the trainee will be able to

- Create an interactive website using any of the mentioned development language.
- Integrate application with database.
- Create multimedia applications by using authoring tools
- Gain familiarity with a very convenient, flexible server-side language: PHP along with front end scripting language HTML 5 and CSS.
- Get exposed to programming concepts of JAVA.
- Use of HTML and CSS for structuring and styling of the webpage.
- Enhance their build website by storing and using customer data to generate dynamic page content using PHP.

Core Module 5 (Business Data Analytics): In this module the trainee will

- Understand business analytics.
- Develop business intelligence
- Develop graphical representation of data
- Develop cluster analysis and its applications
- Perform data partition method for model evaluation and cross validation
- Data transformation
- Demonstrate important predictive models

Elective Module 1 (Cloud Application Developer): In this module the trainee will learn to

- Describe the emerging paradigms that are leading to the adoption of cloud computing and its service model.
- Use of Cloud platform and its service.
- Application development on the cloud (using Eclipse, Node.js).
- Working with the WebSphere /Deployment environment

Elective Module 2 (Cloud Enterprise Developer): In this module the trainee will learn to

- Build a web application with the Express framework.
- Use Web Sphere Development Tools to deploy applications to a server.
- Hands-on on Cloud Integration.
- Use cloud tools to monitor, tune, and troubleshoot.

Elective Module 3 (Web Development using Java): In this module the trainee will be able to

- Understand the object-oriented approach in programming.
- Analyze and design computer programs to solve real world problems based on object-oriented principles.
- Develops the Web Pages using java and deploying the pages in Web server.
- Develops database support for Webpages for storing and retrieving of web data.

On the Job Training: In this module the trainees will be working/training in the Industry for 800 hours. They work as apprentices/Personnel.

Employability Skills: This module is common for all Diploma courses and the total period is 160 hours. In this module the trainees will improve

- English literacy such as Pronunciation, functional grammar, reading, writing, speaking and spoken English
- Learn communication skills, listening skills, motivational training, Facing interviews and behavioural skills.
- Understand concepts of Entrepreneurship, Project preparation and marketing analysis, Institutions support and Investment Procurement.
- Understand on productivity, its benefits, affecting factors, comparison with developed countries, personal finance management.
- UnderstandSafety, Health and Environment Education - Safety & Health, Occupational Hazards, Accident & safety, First Aid, Basic Provisions, Ecosystem, Pollution, Energy Conservation, Global warming, Ground Water, Environment.
- Understand benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment of Wages Act, Employees Provident Fund Act, The Workmen's compensation Act.
- Understand Quality Tools: Quality Consciousness, Quality Circles, Quality Management System, Housekeeping.

2. TRAINING SYSTEM

2.1 GENERAL

Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers a range of Vocational Training courses catering to the need of different sectors of economy/ Labour market. The Vocational Training Programmes are delivered underaegis of Directorate General of Training (DGT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programmes of DGT for propagating vocational training. Recently DGT has started Technical Diplomas for different streams and primarily implemented at DGT field institutes such as ATIs, FTIs and AHI and planned to expand to State Directorates in future.

IT, Networking and Cloud course is very much essential in the current scenario due to a lot of demand in software industries where every industry is using cloud as base. The course is for two years duration. In the first year there are five core modules each module is credit base and employable. Each module is of 320 hours and is very much independent. In second year the trainee will be taking two elective modules out of three electives each of 320 hours and will be doing on the job training in Industry for 800 hours. In addition the trainees will pick up employability skills for 160 hours. After passing out the training programme, the trainee will be awarded Technical Diploma by DGTwhich has worldwide recognition.

Candidates need broadly to demonstrate that they are able to:

- Read and interpret technical parameters/ documents, 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 & employability skills while performing jobs.
- Document the technical parameters related to the task undertaken.

2.2 PROGRESSION PATHWAYS

- Can pursue higher technical education like BE/B. Tech, MCA
- Can start their own enterprise on cloud maintenance, computer hardware maintenance
- Can apply for jobs in Industry as system technician, cloud developer, web designer and trainers.

2.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of two years: -

S No.	Module	Course Element	Notional Training Hours
1	For five Core Modules	Professional Skill (Trade Practical)	1120
		Professional Knowledge (Trade Theory)	480
2	For two Elective Module	Professional Skill (Trade Practical)	448
		Professional Knowledge (Trade Theory)	192
3	Employability Skills		160
4	On the job training		800
	Total		**3200**

Core Components (3200 Hrs) :-

Name		Teaching Hours		Total Hours
Core Subjects (All Compulsory)		**Practical**	**Theory**	
1	Computer Hardware Maintenance	224	96	1600
2	Computer Networking	224	96	
3	Web Designing	224	96	
4	Web Development	224	96	
5	Business Data Analytics	224	96	
Elective Subjects (any two)				
6	Cloud Application Developer	224	96	640
7	Cloud Enterprise Developer	224	96	
8	Web Development using Java	224	96	
Industrial Training				
9	On the Job Training	800		800
Common Subjects				
10	Employability Skills	160		160
Total Hours of Training				**3200**

Note: 1. The trainee must complete all the 5 core modules

2. The trainee must select any of two elective courses from the given three elective options

2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of course at each module and at the end of the training programme as notified by Govt of India from time to time.

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 – I).

b) The final assessment will be in the form of **summative assessment** method. The All India Trade Test for awarding Technical Diploma will be conducted by DGT at the end of each Module/year 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%. For the purposes of determining the overall result, 25 percent weight is applied to the result of each module examination.

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. • Below 70% tolerance dimension achieved while undertaking different work with those demanded by the component/job. • A fairly good level of neatness and consistency in the finish. • Occasional support in completing the project/job.
(b)Weightage in the range of above 75% - 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. • 70-80% tolerance dimension achieved while undertaking different work with those demanded by the component/job. • A good level of neatness and consistency in the finish. • 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. • Above 80% tolerance dimension achieved while undertaking different work with those demanded by the component/job. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.

3. JOB ROLE

Brief description of Job roles:

Computer Programmer/Software Engineer;converts datafrom project specifications andstatements of problems and procedures to create or modify computer programs. Prepares or receives from SYSTEMS ANALYST, detailed workflow chart and diagram to illustrate sequence of steps that the program must follow and to describe input, output, and logical operations involved. Analyses workflow chart and diagram, applying knowledge of computer capabilities, subject matter, and symbolic logic. Confers with Supervisor and representatives of departments concerned with programming to resolve questions of program intent, data input, output requirements, and inclusion of internal checks and controls. Converts detailed logical flow chart to a language that can be processed by a computer.Enters program codes into the computer system. Inputs test data into computer. Observes the computer monitor screen to interpret program-operating codes. Corrects program errors, using methods, such as modifying the program or altering sequence of the program steps. Writes instructions to guide operating personnel during production runs. Analyses, reviews, and rewrites programs to increase operating efficiency or to adapt the program to new requirements. Compiles and writes documentation of program development and subsequent revisions. May train workers to use the program. May assist COMPUTER OPERATORS to resolve problems in running a computer program. May work with SYSTEMS ANALYST to obtain and analyse project specifications and flow charts. May direct and co-ordinate work of others to write, test, and modify computer programs.

Junior Data Associate; is responsible fordesigning and implementing processesand layouts for complex, large-scale datasets used for modelling, data mining, andresearch purposes. Responsibilities alsoinclude designing and implementingstatistical data quality procedures aroundnew data sources.

Web Developer; is responsible for designing and maintaining web-based applications that include static and dynamic content. This includes the design, layout and coding of a website. They may work standalone or along with application/functional developers as part of the overall solution that includes a web based component.

User InterfaceDeveloper;is responsible for creatingcomplex user interfaces for a variety of applications, such as computer programs,databases and websites.

Data CommunicationAnalyst/Network Administrator; Data Communication Analyst researches, tests, evaluates, and recommends data communications hardware and software: Identifies areas of operation which need upgraded equipment, such as modems, fibre optic cables and telephone wires. Conducts survey to determine user needs. Reads technical manuals and brochures to determine equipment which meets establishment requirements. Visits vendors to learn about available products or services. Tests and evaluates hardware and software to determine efficiency, reliability, and compatibility with existing system, using equipment such as computer terminal and modem. Analyses test data and recommends hardware or software for purchase. Develops and writes procedures for installation, use, and solving problems of communications hardware and

software. Monitors system performance. Trains users in use of equipment. Assists users to identify and solve data communication problems. May write technical specifications to send to vendors for bid. May oversee or assist in the installation of communications hardware. May perform minor equipment repairs.

Computer System Hardware Analyst/Hardware Engineer; Computer System Hardware Analyst analyses data processing requirements to plan data processing systems that provide system capabilities required for projected workloads and plans layout and installation of new system or modification of existing system. Confers with Data Processing and Project Managers to obtain information on limitations and capabilities of existing system and capabilities required for data processing projects and projected work load. Evaluates factors such as number of departments serviced by data processing equipment, reporting formats required, volume of transactions, time requirements and cost constraints, and need for security and access restrictions to determine hardware configurations. Analyses information to determine, recommend, and plan layout for type of computers and peripheral equipment, or modifications to existing equipment and system, that will provide capability for proposed project or work load, efficient operation, and effective use of allotted space. May enter data into computer terminal to store, retrieve, and manipulate data for analysis of system capabilities and requirements. May specify power supply requirements and configuration. May recommend purchase of equipment to control dust, temperature, and humidity in area of system installation. May specialize in one area of system application or in one type or make of equipment. May train users to use new or modified equipment. May monitor functioning of equipment to ensure system operates in conformance with specifications.

Reference NCO-2015:

2512.0100 – Computer Programmer / Software Engineer

2521.0202 – Junior Data Associate

2513.0101 – Web Developer

2513.0201 – User Interface Developer

2523.0100 – Data Communication Analyst / Network Administrator

2523.0200 – Computer System Hardware Analyst / Hardware Engineer

4. GENERAL INFORMATION

Name of the Course	**Advanced Diploma (Vocational) in IT, Networking and Cloud**
NCO – 2015	2512.0100 – Computer Programmer / Software Engineer 2521.0202 – Junior Data Associate 2513.0101 – Web Developer 2513.0201 – User Interface Developer 2523.0100 – Data Communication Analyst / Network Administrator 2523.0200– Computer System Hardware Analyst / Hardware Engineer
NSQF Level	Level 6
Duration of Craftsmen Training	2 Years (5 Core Modules of 320 hours each, Two Elective Modules of 320 hours each, On-the-job training of 800 hours and Employability Skills of 160 hours)
Entry Qualification	X/XII Std pass with NTC of any one year or Two-year Trade with minimum 60% marks/First Class. OR XII Std pass with minimum 60% marks/First Class. OR X std pass with three-year diploma from recognized board and minimum 60% marks/First class in Diploma OR Any regular degree from recognized university with minimum 60% marks/ First class.
Minimum Age	17 years as on first day of academic session.
Unit Strength (No. Of Student)	30
Space Norms	70 Sq. m
Power Norms	3.45 KW (for two units in one shift)
Instructors Qualification for	
IT, Networking and Cloud	B.Voc/Degree in Computer Science/Information Technologyfrom AICTE/ UGC recognized University with two-year experience in relevant field. OR Diploma in Computer Science/Information Technology and allied or relevant Advanced Diploma (Vocational) from DGT with five years experience inrelevant field. OR NTC/NAC in the Trade of "Computer Hardware & Network Maintenance (CHNM) Trades" With Seven yearspost qualification experience in the relevant field.

	Essential Qualification: National Craft Instructor Certificate (NCIC) in related trades, in any of the variants under DGT.
(iv) Employability Skill	MBA/ BBA / Any Graduate/ Diploma in any discipline with Two years' experience with short term ToT Course in Employability Skills from DGT institutes. (Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above) OR Existing Social Studies Instructors in ITIs with short term ToT Course in Employability Skills from DGT institutes.
Minimum Age for Instructor	21 Years

NSQF level for Advanced Diploma (Vocational) in IT, Networking and Cloud: Level 6

As per notification issued by Govt. of India dated- 27.12.2013 on National Skill Qualification

6. LEARNING OUTCOMES

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

4.1 LEARNING OUTCOMES (TRADE SPECIFIC)

1. Use basic PC hand tools effectively.
2. Disassemble and assemble PC.
3. Perform basic trouble shoot of PC.
4. Work with different cables, connectors and its Crimping techniques for PC.
5. Install and maintain software's for a PC.
6. Manage files effectively in Windows.
7. Work with Linux environment by using Linux commands.
8. Create document, spread sheets and make presentations using open office.
9. Customize PC in Windows and Linux environment.
10. Manage PC in Window/Linux environment
11. Perform troubleshooting and maintenance of PC based on the faulty condition.
12. Understand basic computer network technology.
13. Understand and configure server environment and backup services.
14. Configure different protocol services.
15. Install and configure Linux server environment.
16. Install & configure the different types of network devices in a network.
17. Configure and manage network security.
18. Configure and perform remote accessing & routing.
19. Get familiarize with internet and E-Commerce sites.
20. Create simple web pages using HTML 5.
21. Create Styles of web pages using CSS.
22. Create own account in cloud and hosting.
23. Configure embedded database with different web pages using Mongo DB.
24. Design and develop dynamic websites with PHP.

25. Make websites, web servers, game frameworks, desktop and CLI applications, and IDE using Python.
26. Understand how web works.
27. Structuring the web.
28. Scripting and Styling the web (CSS).
29. Enhancing the web using PHP.
30. Java: The key language
31. Understand business analytics and develop business intelligence.
32. Analyzedata using statistical and data mining techniques for business intelligence.
33. Understand case studies for predictive models.
34. Develop case studies for predictive analytical models.
35. Understand the Cloud architecture patterns, working with the WebSphere /Deployment environment.
36. Build a web application with the Express framework, Use Web Sphere Development Tools to deploy applications to a server.
37. Deploy cloud application and cloud integration.
38. Develop the real time scenarios based on OOPs concepts and Java.
39. Develop Web pages using Java.
40. Establish database support for dynamic Webpages.
41. Develop Website using Java and deploy in cloud.

4.2 LEARNING OUTCOMES (EMPLOYABILITY SKILLS)

1. Exhibit leadership qualities and entrepreneurship skills.
2. Apply organizational principles and practices using creative abilities and digital skills.
3. Organize work efficiently by self-management and effective communication.
4. Implement Continuous Professional Development (CPD) using emotional intelligence.

LEARNIG OUTCOMES (TRADE SPECIFIC)		
MODULE 1: COMPUTER HARDWARE MAINTENANCE		
Sl. No.	**Learning Outcomes**	**Assessment Criteria**
1	Use basic PC hand tools effectively	1.1 Remove screws using a screwdriver.
		1.2 Cut and Skin cables using a cutting plier.
		1.3 De-solder electronic components using De-soldering pump, Removeelectronic components using tweezers.
		1.4 Solder electronic components.
		1.5 Crimp CAT 6 cables using a crimping tool.
2	Disassemble and assemble PC	2.1 Remove power cords and peripheral Cables.

5	Install and maintain software for a PC.	5.1 Software Installation.
		5.2 Prepare Hard disk for OS installation bymaking partitions.
		5.3 Setup CMOS with desired parameters forhard disk and set date and time.
		5.4 Install Operating System Windows andLinux in two different partitions.
		5.5 Create user accounts as administrator and Guest.
		5.6 Install Device Drivers.
		5.7 Install/Uninstall Application software(Office, Multimedia and Antivirus).
6	Manage files effectively in Windows and Linux environment	6.1 Draft a document using NotePad forpractice on Key Board.
		6.2 Create, save, rename, move, copy and delete files and folders.
		6.3 Transfer files and folders from/to externalstorage devices.
		6.4 Create a zip file.
		6.5 Extract the zip file.
		6.6 Create an automatic backup.
		6.7 Hide/unhide files/folder.
		6.8 Create a password for individual files.
7	Work with a Linux environment by using Linux commands	7.1 TTY Command, named Command, Date, cal, Whoami, Man, Pwd, Whatis, Fdisk, Sudo, Ifconfig, Chmod, Umask, Adduser, Ping, Hostname, Dpkg –i.
		7.2 Touch, echo, clear, ls, Dir, Mkdir, Cat,Rmdir, Rm, Cp, Mv , Find, Head, Tail, Tar,Gzip, Bzip2, Alias, Sed, wc.
8	Create a document, spreadsheets and make presentations using open office	8.1 Draw sketches using paint.
		8.2 Create your resume using edit commands in document.
		8.3 Create purchase order using tables and images.
		8.4 Create magazine using columns page borders, header footers.
		8.5 Create an invitation letter using mail merge for n invitees.
		8.6 Create mark sheet using a spreadsheetwith data validation.
		8.7 Create a chart for the mark sheet.
		8.8 Create Pay slip using functions and formulae.
		8.9 Create Pivot table/chart for inventory management.
		8.10 Create Presentation by inserting charts, tables and images of the organization.

9	Customize PC in Windows and Linux environment	9.1 Set the system date and time.
		9.2 Change the display properties forBackground, Resolution, Screensaver, Desktop icons, Gadgets.
		9.3 Personalise Taskbar for Hide and Lock, Pin and unpin applications.
		9.4 Setting the control panel for Add/remove hardware, Install/uninstall the software, Change properties of peripheral Device, Enable system security, Language and region, Change input methods using language and region
10	Manage PC in Window/Linux environment	10.1 Create and format partitions, volumes, assigning drive letters using disk partcommand.
		10.2 Browse and Manage event logs using the event viewer.
		10.3 Schedule and maintain automated tasksat a specific time using task scheduler.
		10.4 Install and update the drivers for hardware devices usingdevice manager.
		10.5 Stop/start service using SC config. Command.
		10.6 Create file shares and set permission.
		10.7 Share files to different users and manage.
		10.8 Start/stop the application using task manager.
		10.9 Monitor PC performance using task manager.
		10.10 Close programs which are not responding using the task manager.
		10.11 Install anti-virus.
		10.12 Run a full system scan.
		10.13 Fix browser from redirecting to other websites (browser hijack).
		10.14 Blocking un-trusted network.
		10.15 Block social network websites.
11	Perform troubleshooting and maintenance of PC based on the faulty condition.	11.1 Check power cable continuity.
		11.2 Check SMPC DC output, check cablesand connectors.
		11.3 Check cabinet power on buttonService CPU ON and no display.
		11.4 Check DC power supply from SMPS to motherboard.
		11.5 Remove sound cord if any and check for restoration of the booting process. 11.6 Check for proper insertion of RAM.
		11.7 Check for dust on the motherboard.
		11.8 Replace SVGA cord with a new one.

		11.9 Check for any crack on motherboard PC.
		11.10 Check for overheating of any ICs onmotherboard.
		11.11 Replace BIOS.
		11.12 Service if the system is frequently restarting Replace the RAM.
		11.13 Check for any boot virus.
		11.14 Check all the connections of the motherboard.
		11.15 Service if the system gives continuous beep sound, Check for proper insertion of RAM.
		11.16 Check for dust on the motherboard.
		11.17 Replace SVGA cord with a new one.
		11.18 Service if System not Booting Check SATA/IDE cable and SMPS.
		11.19 Check HDD partition problem.
		11.20 Check CMOS battery voltage.
		11.21 Check HDD parameters in CMOS setup.
		11.22 Check for boot virus.
		11.23 Service if OS not loading Check RAM.
		11.24 Check proper installation of Driver Software in device manager.
		11.25 Uninstall recently performed drivers.
		11.26 Boot in safe mode.
		11.27 Service if the system gets frequently hanging Check for the proper working of CPU Cooler fan.
		11.28 Check for dust in the motherboard.
		11.29 Run chkdisk.
		11.30 Check for boot virus.
		11.31 Boot in safe mode.
		11.32 Reload OS.
		11.33 Service if the system is very slow.
		11.34 Close all opened applications.
		11.35 Run msconfig and remove unwanted startup applications.
		11.36 Check virus effect on OS.
		11.37 Run Chkdisk.
		11.38 Troubleshoot if the paper is a jam in the printer.
		11.39 Check for any loose components in the feed assembly.
		11.40 Check for any blockage in paper eject assembly.
		11.41 Check if paper put tray is full.
		11.42 Check paper pick up sensor.
		11.43 Check paper pick up roller for any damage.

		11.44 Check-in cartridge access cover. Remove and insert the cartridge.

	MODULE 2: COMPUTER NETWORKING	
1	Understand basic computer network technology.	1.1 Crimp Straight Cable using Different Colour Code
		1.2 Crimp Cross Cable using Different Color Codes
		1.3 Crimp Rj45 connector with Straightand Cross cable
		1.4 Check signal transmission using LANTESTER
		1.5 Install and configure Peer to Peer connection.
		1.6 Configure IP Address.
2	Understand and configure server environment and backup services.	2.1 Install and configure Server-Client Network.
		2.2 Install and Configure Windows Server.
		2.3 Configure a server as the web server.
		2.4 Configure Mailbox Server.
		2.5 Backup and Restore ADS and DHCP.
		2.6 Backup and Restore User Data.
		2.7 Permit FAT and NTFS Sharing.
3	Configure different protocol services.	3.1 Add Account
		3.2 Implement AGDLP Process
		3.3 Implement User Authentication Strategy
		3.4 Plan and Implement OU Structure
		3.5 Plan and Maintain Group Policies
		3.6 Configure User Environment
		3.7 Install and Configure Active Directory Services.
		3.8 Installation and Configuring DNS Services
		3.9 Installation and Configuring DHCP Services
		3.10 Install and Configure FTP Services.
		3.11 Install and Configure HTTP Services
		3.12 Configure IIS Services
4	Install and configure a Linux server environment.	4.1 Install Linux Server
		4.2 Create a new user and group
		4.3 Create public and data directory
		4.4 Create a lmlhosts file
		4.5 Check host file
		4.6 Filter ports
		4.7 Secure and run SWAT
		4.8 Install and configure Telnet.

5	Install & configure the different types of network devices in a network.	5.1 Configure & Implement Unmanageable Network Switch
		5.2 Configure & Implement Manageable Network Switch.
		5.3 Install and configure router, bridges, and HUB.
		5.4 Configure Wireless Access Point.
		5.5 Install and Configure Wire Network.
		5.6 Install and Configure Wireless Network.
		5.7 Install of AD-hoc Wireless Network.
		5.8 Configure Gateway Service for Internet Connectivity.
		5.9 Configure ADSL+2 Router for ISP Internet Connectivity.
		5.10 Troubleshoot Internet Connectivity.
6	Configure and manage network security.	6.1 Managing Server Network Security.
		6.2 Set up security baseline.
		6.3 Configure Audit Policy.
		6.4 Monitor and Troubleshoot Network protocol.
		6.5 Configure Protocol Security.
		6.6 Plan security for Wireless Network.
		6.7 Install and Configure Different Antivirus Software.
		6.8 Install and Configure Admin Console.
		6.9 Configure Local Security Policies.
		6.10 Configure Domain Security Policies.
		6.11 Configure RRAS Policies.
7	Configure and perform remote accessing & routing.	7.1 Manage TCP/IP Routing.
		7.2 Configure Remote Access Authentication Protocol.
		7.3 Connect remote Desktop using Remote Assistance.
		7.4 Connect Remote Desktop using Telnet.
		7.5 Connect Remote Desktop using HyperTerminal.
		7.6 Connect Remote Desktop using Team Viewer.
8	Get familiarize with internet and E-Commerce sites.	8.1 Configure web browser.
		8.2 Search for content using popular search engines.
		8.3 Use favourite folder for browsing quickly.
		8.4 Download & Print Web pages.
		8.5 Create and send e-mail, Reply to an e- mail message and a Forward email message.
		8.6 Send document/softcopy by email.
		8.7 Activate spell check using the address book and Handle SPAM.
		8.8 Sorting and search emails.
		8.9 Block emails using filter.

		8.10 Store download file in mail drives.
		8.11 Communicate using text, video chatting and social networking sites.
		8.12 Protect the computer against variousinternet threats.
		8.13 Browse e-commerce website.
		8.14 Place order for items.
		8.15 Add items to Shopping Carts.
		8.16 Do online payment through a payment gateway or another payment method.
		8.17 Do online Bill payment of serviceproviders.

MODULE 3: WEB DESIGNING		
1	Create simple web pages using HTML 5.	1.1 Create HTML document using mark-up Tags in HTML editor (Notepad). 1.2 Open/run the HTML file in a web browser to check the output. 1.3 Modify above HTML document using heading – Paragraphs. 1.4 Modify above HTML document using Line Breaks. 1.5 Modify above HTML document using HTML Tags. 1.6 Create Text, Lists, Tables, and Frames. 1.7 Create Hyperlinks, Images and Multimedia Working with Forms and controls.
2	Create Styles of web pages using CSS.	2.1 Create a CSS document by using the ID selector 2.2 Create a CSS document by using the Class selector, Universal Selector and Grouping selector. 2.3 Create CSS document with fonts: Bold, Italics, oblique. 2.4 Design Stylesheet document with text transformation: Uppercase, Lowercase and capitalize. 2.5 Create CSS document with font size in different pixels 2.6 Create CSS document with font weight thinner, thicker, bold. 2.7 Create CSS document with alignment centre, right and left. 2.8 Create CSS document with background colours and font Colours. 2.9 Create CSS document with text hovering. 2.10 Create CSS document with text decoration. 2.11 Create CSS document with block elements and objects. 2.12 Create Lists and Tables. 2.13 Create Box Model by using borders, Padding, and Margin.

		2.14 Crate CSS document by Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, NavigationBar, Image Sprites, Attribute sector). 2.15 Creating page Layout and Site Designs.
3	Create own account in cloud and hosting.	3.1 Install Web server in Cloud. 3.2 Creating own account in the cloud and launch and track no. of visitors. 3.3 Hosting in Amazon Web.
4	Configure the embedded database with different web pages using Mongo DB	4.1 Install of MongoDB in the system 4.2 Create data with the following Data types – String, Integer, Boolean, double, min/max keys, arrays, timestamp, object, Null, symbol, date, object ID, Binarydata, Code, Regular Expression 4.3 Insert Document in database 4.4 Update document in the database 4.5 Delete document in the database 4.6 Project document in the document 4.7 Create a MongoDB query to display all the documents in the collection data (Trainees data) 4.8 Create a MongoDB query to display the fields id, trainee name, lab name, Certificate No., course title,course starting date, the course ending date for all thedocuments in the collection trainee's data. 4.9 Create a MongoDB query to display the fields id, trainee name, lab name, Certificate No., course name, course starting date, the course ending date for all the documents in the collection trainee's data, but excluding lab name 4.10 Create a MongoDB query to display all the trainees who attended a course on PHP 4.11 Create a MongoDB query to display the 1st batch trainees of PHP 4.12 Create a MongoDB query to display the 2nd batch trainee

		of a circle. 6.26 Write a python program to sort a list of elements using the bubble sort algorithm. 6.27 Write a python program to copy the content of a fileto another file. 6.28 Write a python program to find the frequency of words in a file.

MODULE 4: : Web DEVELOPMENT		
1	Understand how the web works	1.1 Create web page content using HTML (Hyper Text Markup Language) Tags. 1.2 Enable Hypertext Transfer Protocol (HTTP) via getting and POST requests. 1.3 Obtain input from users.
2	Structuring the web	2.1 Divide a webpage into logical sections. 2.2 Set up a proper structure of headings andParagraphs. 2.3 Display computer code with HTML. 2.4 Annotation of images and graphics. 2.5 Marking abbreviations. 2.6 Add quotations and citations to web pages. 2.7 Embed a webpage within another webpage. 2.8 Add Flash content within a webpage. 2.9 Create a data spreadsheet. 2.10 Create HTML tables. 2.11 Optimize HTML table rendering. 2.12 Create collapsible content with HTML. 2.13 Add context menus to a webpage. 2.14 Create of a dialogue box with HTML. 2.15 Add multiple languages into a single Webpage. 2.16 Controlling of HTML line breaking. 2.17 Mark changes (added and removed text). 2.18 Add responsive image to a webpage. 2.19 Add vector image to a webpage. 2.20 Add a hit map on top.
3	Scripting and Styling the web (CSS)	3.1 Apply CSS within a webpage. 3.2 Apply CSS to HTML. 3.3 Select elements via element name, class or ID. 3.4 Select elements via attribute name and Content. 3.5 Apply pseudopply CSS to HTML.

		Series without using recursion and using Recursion. 5.5 Java Program to Solve any Linear Equation One Variable. 5.6 Java Program to Find Inverse of a Matrix. 5.7 Java Program to Perform Encoding of aMessage Using Matrix Multiplication. 5.8 Write a Java program to sort a numeric array and a string array. 5.9 Write a Java program to remove a specific an element from an array. 5.10 Write a Java program to get the minimum value of the year, month, week, date fromthecurrent date of a default calendar. 5.11 Perform animation in the applet. 5.12 Write a java program to paint like paint brush in the applet. 5.13 Program to display analog clock in the Applet. 5.14 Program to communicate two applets. 5.15 Write a Java program to convert a hash set to a tree set. 5.16 Create runnable jar file in java? 5.17 Display image on a button in the swing. 5.18 Program to change the component colour by choosing a colour from Colour Chooser. 5.19 Program to create a notepad in swing? 5.20 Program to inherit Frame class. 5.21 Program to perform two tasks by two Threads.

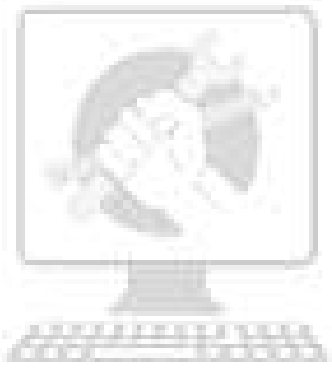
MODULE 5: BUSINESS DATA ANALYTICS		
1	Understand business analytics and develop business intelligence.	1.1 Use Excel for understanding different types of data (Integer, double, text, date). 1.2 Perform operations on different data types. 1.3 Segregate data in different sheets. 1.4 Calculate the arithmetic mean, geometric mean and Harmonic mean. 1.5 Calculate median from raw & grouped data. 1.6 Calculate mode for row & grouped data. 1.7 Calculate the standard deviation for a set of data 1.8 Calculate standard variance for a set of data. 1.9 Online analytics processing using (OLAP) tools. 1.10 Use OLTP for CRM and retail sales using web focus infoassists or Excel.

2	Analyze data using statistical and data mining techniques for business intelligence.	2.1 Segregate structured data &unstructured data. 2.2 Exercises on data integration. 2.3 Exercises on data clearing. 2.4 Create a data dimension. 2.5 Exercises on data warehousing. 2.6 Exercises on data visualization. 2.7 BI case studies to improve customer experience in roles & responsibilities. 2.8 Case studies on self-service & collaborative BI. 2.9 Exercises on BI strategies. 2.10 Exercises on the BI project.
3	Understand case studies for predictive models.	3.1 Exercises on data representation & cluster Analysis. 3.2 Case studies on different patterns of data. 3.3 Case studies on pre-processing the data. 3.4 Case studies on transforming the preprocessed data. 3.5 Case studies on segregating pre-processed data into different patterns. 3.6 Case studies on Evaluating the data patterns. 3.7 Case studies on Tread Analysis. 3.8 Case studies on statistical approach for data mining through. 3.9 Bayesian network. 3.10 Regression Analysis. 3.11 Correlation Analysis. 3.12 Cluster Analysis. 3.13 Case studies on CRISP – DM model. 3.14 Case studies on data partitioning.
4	Develop case studies for predictive analytical models.	4.1 Exercise for machine learning approach: 4.1.1 Case studies on Decision tree induction Method. 4.1.2 Studies on inductive concept learning. 4.1.3 Case studies on conceptual cluster learning. 4.2 Exercise on database oriented approach: 4.2.1 Case studies on attribute-oriented induction 4.2.2 Case studies on iterative database scanning. 4.2.3 Case studies on attribute focusing. 4.3 Exercise on other approaches 4.3.1 Case studies on neural networks. 4.3.2 Case studies on Rough Sets. 4.3.3 Case studies on Visualisation. 4.4 Case studies on odds and odds ratio.

	Elective 1: Cloud Application Developer	
1	Understand the Cloud architecture patterns, Working with the WebSphere /Deployment environment.	1.1 Overview of cloud platform dashboards. (IBM Blue mix) 1.2 Operations like creation, launch, security, and cleaning of instances will be performed. 1.3 Bluemix and the Cloud Foundry command line interface (CLI) 1.4 Develop Bluemix applications with Eclipse 1.5 Develop Bluemix applications with IBM Bluemix DevOps services 1.6 Bluemix with Cloud ant 1.7 Build a mobile data Bluemix application 1.8 Extend the Bluemix mobile data application to access it from a mobile web application.Skills on Developing Cloud Applications with IBM SDK for Node.js 1.9 Set up your Node.js development environment in IBM BlueMix 1.10 Asynchronous I/O with call-back 1.11 Node packages.
2	Develop Cloud applications.	2.1. Simple Chat application 2.2. Hello World 2.3. Deploy the created application into Liberty profile

	Elective 2: Cloud Enterprise Developer	
1	BUILD a web application with the Express framework, Use Web Sphere Development Tools to deploy applications to a server.	1.1 Setting up the environment 1.2 Deploying Tomcat application to Bluemix 1.3 Installing and running the migration analysis tools 1.4 Creating a database service in Bluemix 1.5 Deploying the application in Bluemix 1.6 Testing the application 1.7 Deleting the application 1.8 Installing a local Tomcat server into Eclipse 1.9 Importing and running the application in Eclipse 1.10 Running the cloud migration analysis tools 1.11 Analysing the results 1.12 Creating database service in Bluemix 1.13 Deploying the application in the cloud 1.14 Testing your application (optional) 1.15 Deleting the application

1.16 Running the document manager application on-premises
1.17 Setting up the migration environment
1.18 Migrating the server configuration by using the configuration migration tool.
1.19 Importing and analysing the application
1.20 Migrating the application Deploying the application to Bluemix
1.21 Setting up security functionalities
1.22 Setting up of alarmsSkills on Integration of Bluemix Applications with On-premises Resources On-premises Resources
1.23 Building an IBM Container that represents a back-end



	Elective 3: Web Development using Java	
1	Develop real-time scenarios based on OOPs concepts and Java	1.1 Write a program to demonstrate encapsulation & Write a Java program to print 'Hello' on screen and then print your name on a separate line. 1.2 Write a program in Java to display the pattern like right angle triangle with a number. 1.3 Write a program to demonstrate static and dynamic polymorphism. 1.4 Write a program to demonstrate method overloading and overriding 1.5 Write a program to create a constructor for a class. 1.6 Write a Java program to sort ascending / Descending of given array 1.7 Write a Java program to add two matrices 1.8 Write a Java program to test the equality of two arrays 1.9 Write a Java Programme to find that the given string is Palindrome? 1.10 Write a program to create wrapper classes. 1.11 Write a program to demonstrate a single level, multiple level inheritance. 1.12 Write a program to demonstrate super keyword 1.13 Write programs to demonstrate the interfaces in Java 1.14 Write programs to demonstrate the abstract class in java 1.15 Write a program to create and use a package in java 1.16 Write a program to demonstrate inner classes in java 1.17 Write programs to demonstrate try-catch blocks in java 1.18 Write a program to demonstrate throws keyword in java 1.19 Write a program to demonstrate finally keyword in java 1.20 Write a program to Create user defined exceptions in java 1.21 Write a program to demonstrate multi-threading in java 1.22 Write a program to create a login page using Java AWT 1.23 Write a program to create different grid layouts using Java AWT 1.24 Write a program to create a job Registration form using Java AWT 1.25 Write a program to handle the events for —Sign UP‖ and —Login‖ button clicks 1.26 Write a program to handle the events in the

		registrationform
2	Develop Web pages using Java.	2.1 Write simple Servlet Hello World, compile and deploy it 2.2 Write simple Servlet program to pass and read values to Hello from using the GET method 2.3 Write simple Servlet program to pass and read values to Hello from using POST method 2.4 Write a simple Servlet program to read values from checkbox. 2.5 Write a servlet program to read HTTP header information 2.6 Write a servlet to send 407 error code to the client browser and to display the message as —Need Authentication 2.7 Write Servlet program to print client IP, Date & Time using servlet filters 2.8 Write a program to perform basic exception handling in servlets 2.9 Write a servlet program to set cookies to the First name, Second Name, Mobile No, Email ID fields in a form 2.10 Write a servlet program to read cookies names and values 2.11 Write a Servlet program to display the session information of webpage 2.12 Write a servlet program to access employees table from database 2.13 Write a servlet program to edit, update and delete employee's information in the database 2.14 Write a servlet program to display current data & time on webpage 2.15 Write a servlet program for an auto page refresh.
3.	Establish database support for dynamic WebPages.	3.1 Create a connection to the database (MSAccess/MySQL/xrad Ge) using JDBC

Syllabus forAdvanced Diploma (Vocational) in "IT, Networking and Cloud"			
Core Module 1: Computer Hardware Maintenance: 320 Hrs			
Hour No.	**Learning outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		(with indicative Hours)	
1-8	Use basic PC hand tools effectively.	**Skills on using Basic PC Hand Tools (5hrs)** • Remove screws using screw driver	

		Drive and fix CMOS Battery (1 Hr) • Connect the SMPS and add on cords (1 Hr) • Assemble the cabinet. And connect the peripherals (1 Hr) • Connect power cords and switch on power supply and run the PC (1 Hr)	opening and closing PC cabinet.
25-32	Perform basic trouble shoot of PC .	**Basic Trouble Shooting PC (5 Hrs)** • Check PC Power Supply(1 Hr) • SMPS cables and connections to the mother board (1 Hr) • Check connection of I/O devices to PC (1 Hr) • Remove and reinsert RAMand reinsert CMOS battery (1 Hr) • Check HDD/DVD cables (1 Hr)	**Basic Trouble Shooting PC (3 Hrs)** Proper troubleshooting

		Hrs) • Install Device Drivers (1 Hr) • Install/Uninstall Application software (Office, Multimedia and Antivirus) (1 Hr)	
57-80	Manage files effectively in Windows	**File Management (15 Hrs)** • Draw sketches using paint for practice on mouse/touch pad (2 Hrs) • Draft a document using Note Pad for practice on Key Board (3 Hrs) • Create, save, rename, move, copy and delete files and folders.(2 Hrs) • Transfer files and folders from/to external storage devices (1 Hr) • Create zip file (1 Hr) • Extract the zip file (1 Hr) • Create automatic backup (2 Hrs) • Hide/unhide files/folders (1 Hr) • Create password for individual files (2 Hrs)	**File Management (9 Hrs)** • Functions of Key board and Mouse • Applications MS Paint/Note pad • Different text formats • Different image file formats • Advantages of compressing files • Distinguish between backup and cloning
81-104	Work with Linux environment by using Linux commands.	**Linux (15 hrs)** Read terminal ID using TTY command to know which terminal we are working (1 Hrs) Execute the following Linux Commands • TTY Command, uname Command, Date, cal, Whoami, Man, Pwd, Whatis, Fdisk, Sudo, Ifconfig, Chmod, Umask, Adduser, Ping, Hostname, Dpkg –i (7 Hrs) • Touch, echo, clear, ls, Dir, Mkdir, Cat, Rmdir, Rm, Cp, Mv, Find, Head, Tail, Tar, Gzip, Bzip2, Alias, Sed, wc, sort. (7 Hrs)	**Linux (9 hrs)** • Introduction to Linux operating system • Familiarization with GUI environment • Syntax of shell commands
105-	Create document,	**Open Office (35 Hrs)**	**Open Office (21 Hrs)**

160	spread sheets and make presentations using open office	• Draw sketches using paint (2 Hrs) • Create your resume using edit commands in document (3 Hrs) • Create purchase order using tables and images (5 Hrs) • Create magazine using columns page borders, header footers (2 Hrs) • Create an invitation letter using mail merge for n invitees (3 Hrs) • Create mark sheet using spread sheet with data validation (3 Hrs) • Create chart for mark sheet (2 Hrs) • Create Pay slip using functions and formulae (5 Hrs) • Create Pivot table/chart for inventory management (5 Hrs) • Create Presentation by inserting charts, tables and images about organization (5 Hrs)	Familiarisation of open office tools for creating documents, spread sheet and presentation
161-200	Customize PC in Windows and Linux environment	**PC customization (Windows/Linux) (25 Hrs)** • Set the system date and time (2 Hrs) • Change the display properties for - Back ground - Resolution - Screen saver - Desktop icons - Gadgets (8 Hrs) • Personalise Taskbar for - Hide and Lock - Pin and unpin applications (5 Hrs) • Setting the control panel for - Add/remove hardware - Install/uninstall software	**PC customization (Windows/Linux) (15 Hrs)** • Concept of GUI, Modes of starting on different occasions. • Desktop, Icon, selecting, choosing, drag and drop. My computer • Recycle bin, task bar, start menu, tool bar, and menus. • Windows Explorer. Properties of files and folders. • Applications under windows/linux accessories. • Windows/Linux Help. • Finding files, folders, computers.

		- Change properties of peripheral devices - Enable system security - Language and region - Change input methods using language and region (10 Hrs)	• Control panel. Installed devices and properties.
201-240	Manage PC in Window/Linux environment	**PC Management (25 Hrs)** • Create and format partitions, volumes, assigning drive letters using disk part command (3 Hrs) • Browse and Manage event logs using event viewer (2 Hrs) • Schedule and maintain automated tasks at specific time using task scheduler (1 Hr) • Install and update the drivers for hardware devices using device manager (3 Hrs) • Stop/start service using SC config command (1 Hr) • Create file shares and set permission (1 Hr) • Share files to different users and manage (1 Hr) • Start/stop application using task manager (1 Hr) • Monitor PC performance using task manager (1 Hr) • Close programs which are not responding using task manager (1 Hr) Anti Virus • Install anti virus (2 Hrs) • Run a full system scan (2 Hrs) • Fix browser from redirecting to other websites (browser hijack) (2 Hrs) • Blocking un-trusted network (2 Hrs) • Block social network websites	**PC Management (15 hrs)** Familiarization with • Disk management • Task scheduler • Even viewer • Device manager • Shared folders • Services and applications Virus Different types of virus an anti virus Using different types of firewalls - pocket firewalls, State-full firewalls, Application layer firewalls and Proxy firewalls

		(2 Hrs)	
241-320	Perform troubleshooting and maintenance of PC based on the faulty condition.	**Hardware Maintenance (50 hrs)** Service of Dead PC (5 Hrs) • Check power cable continuity • Check SMPC DC output, check cables and connectors • Check cabinet power on button Service CPU ON and no display (5 Hrs) • Check DC power supply from SMPS to mother board • Remove sound cord if any and check for restoration of booting process • Check for proper insertion of RAM • Check for dust on mother board • Replace SVGA cord with new one • Check for any crack on mother board PC • Check for overheating of any ICs on mother board • Replace BIOS Service if system is frequently restarting (5 Hrs) • Replace the RAM • Check for any boot virus • Check all the connections of mother board Service if system gives continuous beep sound (5 Hrs) • Check for proper insertion of RAM • Check for dust on mother board • Replace SVGA cord with new one	**Hardware Maintenance (30 Hrs)** • Explain and apply common prevention methods • Explain Service Flow Sequence (SFS) and Trouble Shooting Chart (TSC) of PC • Safety precautions in handling PC, sub assemblies and components, Important points to be considered while purchasing and replacing components. Concept of Preventive and corrective maintenance. Tools required, Active & Passive Maintenance, Maintenance scheduling. Need of diagnostics program. Features, limitations. Examples of commonlyused diagnostic programs. • Types of monitor, Monochrome and colour, CGA, EGA, VGA, SVGA, Digital Analogue, interlaced non interlaced. Specifications and comparison • Main components and connectors on display cards, display controller IC, RAM chips and dual port feature principle of working and use of display memory. • LCD and TFT Monitors. • Understanding the difference between flat screens and CRT display systems • Understanding the displays memory and its effect on

		Service if System not Booting (10 Hrs) • Check SATA/IDE cable and SMPS • Check HDD partition problem • Check CMOS battery voltage • Check HDD parameters in CMOS setup • Check for boot virus Service if OS not loading(5Hrs) • Check RAM • Check proper installation of Driver Software in device manager • Uninstall recently performed drivers • Boot in safe mode Service if system gets frequently hanging (5 Hrs) • Check for proper working of CPU cooler fan • Check for dust in mother board • Run chkdisk • Check for boot virus • Boot in safe mode • Reload OS Service if system is very slow (5 Hrs) • Close all opened applications • Run MSconfig and remove unwanted startup applications • Check virus affect on OS • Run Chkdisk Troubleshoot if paper is jam in printer (5 Hrs) • Check for any loose components in feed assembly • Check for any blockage in paper eject assembly	quality and performance

		• Check if paper put tray is full • Check paper pick up sensor • Check paper pick up roller for any damage • Check in cartridge access cover • Remove and insert cartridge	
	Project work/ Industrial Visit		
	Revision		

Syllabus forAdvanced Diploma (Vocational) in "IT, Networking and Cloud"			
Core Module 2: Computer Networking: 320 Hrs			
Hour No.	**Learning outcome Reference**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		(with indicative Hours)	
321-360	Understand basic computer network technology.	**Crimp and connect Cable(25 hrs)** • Crimp Straight Cable using Different Color Codes (5 Hrs) • Crimp Cross Cable using Different Color Codes (5 Hrs) • Crimp Rj45 connector with Straight and Cross cable (3 Hrs) • Check signal transmission using LAN TESTER (2 Hrs) • Install and configure Peer to Peer connection. (5 Hrs) • configure IP Address (5 Hrs)	**Overview of Networking (15 hrs)** Introduction to networks, LAN, VLAN, CAN, MAN, WAN, Internet and Intranet etc. Uses and benefits of Network, Server-client based network, peer to peer networks. Network Interface Card, Crimping tools and Color standards for Straight crimping and Cross crimping
361-400	Understand and configure server environment and backup services.	**Server Configuration &Backup(25 hrs)** • Install and configure Server-Client Network (5 Hrs) • Install and Configure Windows Server (5 Hrs) • Configure a server as web server (5 Hrs) • Configure Mailbox Server (2 Hrs) • Backup and Restore ADS and DHCP(3 Hrs) • Backup and Restore User Data (2 Hrs) • Permit FAT and NTFS Sharing (3 Hrs)	**Transmission Media and Topologies Media types**:**(15hrs)** Concept of Server, client, node, segment, backbone, host etc. Analog and Digital transmission STP cable, UTP cable, Coaxial cable, Fiber cable, Base band and Broadband transmission, Cables and Connectors, Physical and logical topologies, Bus, Star, Ring and Mesh topologies. Concept of Asynchronous & Synchronous Transmission
401-440	Configure different protocol services.	**Plan and Implement User and Group Strategies (25 hrs)** • Add Account (1 Hr) • Implement AGDLP Process (2 Hrs.) • Implement User Authentication Strategy (2	**Implement User and Group Strategies(15 hrs)** • User Authentication Strategy • OU Structure • User Environment • Group Policies • AGDLP Process

		Hrs) • Plan and Implement OU Structure (1 Hr) • Plan and Maintain Group Policies (2 Hrs) • Configure User Environment (2 Hrs) **Protocols and Services** • Install and Configure Active Directory Services (2 Hrs) • Installation and Configuring DNS Services (3 Hrs) • Installation and Configuring DHCP Services (2 Hrs) • Install and Configure FTP Services. (3 Hrs) • Install and Configure HTTP Services (2 Hrs) • Configure IIS Services (3 Hrs)	**Protocols and Services** • TCP/IP,HTTP, FTP,SMTP and other Different types of protocols • OSI Model • Media Access Method • DNS services • DHCP services • WINS services • RAS services • Web services • Proxy Services.
441-480	Install and configure Linux server environment.	**Linux Server installation and configuration(25 hrs)** • Install Linux Server (3 Hrs) • Create new user and group (2 Hrs) • Create public and data directory (2 Hrs) • Create anlmlhosts file (3 Hrs.) • Check host file (2 Hrs) • Filter ports (3 Hrs) • Secure and run SWAT (5 Hrs) • Install and configure Telnet (5 Hrs)	**Linux Server installation and configuration (15 hrs)** • Configuration Plan • Public and data directory • Host file • SWAT • Password
481-520	Install & configure the different types of network devices in a network.	**Network Devices(25 hrs)** • Configure & Implement Unmanageable Network Switch (3 Hrs) • Configure & Implement Manageable Network Switch (2 Hrs) • Install and configure router, bridgesandHUB (3 Hrs) • Configure Wireless Access Point (2 Hrs) • Install and Configure Wire	**Network Devices(15 hrs)** • Functions of NIC • Repeaters • Hub • Switches • Routers • Bridges. • Internet service provider

		Network (2 Hrs) • Install and Configure Wireless Network (2 Hrs) • Install of AD-hoc Wireless Network (1 Hr) Manage Broad Band • Configure Gateway Service for Internet Connectivity (3 Hrs) • Configure ADSL+2 Router for ISP Internet Connectivity (2 Hrs) • Troubleshoot Internet Connectivity (5 Hrs)	
521-560	Configure and manage network security.	**Network Security(25 hrs)** • Managing Server Network Security (3 Hrs) • Set up security base line (2 Hrs) • Configure Audit Policy (2 Hrs) • Monitor and Troubleshoot Network protocol (3 Hrs) • Configure Protocol Security (2 Hrs) • Plan security for Wireless Network (1 Hr) • Install and Configure Different Antivirus Software (2 Hrs) • Install and Configure Admin Console(3 Hrs) • Configure a Local Security Policies (2 Hrs) • Configure Domain Security Policies (3 Hrs) • Configure RRAS Policies (2 Hrs)	**Network Security(15 hrs)** • Modern Network Security Threats and the basics of securing a network. • Secure Administrative Access • LAN security considerations. • Network Security Devices.
561-600	Configure and perform remote accessing & routing.	**Remote Access(25 hrs)** • Manage TCP/IP Routing (5 Hrs) • Configure Remote Access Authentication Protocol (5 Hrs) • Connect remote Desktop using Remote Assistance (5	**Remote Access (15 hrs)** • Overview of Remote Access • VPN Concepts. • Remote Access Authentication Protocol • TCP/IP Routing

		Hrs) • Connect Remote Desktop using Telnet (3 Hrs) • Connect Remote Desktop using HyperTerminal (2 Hrs) • Connect Remote Desktop using Team Viewer (5 Hrs)	
600-640	Get familiarize with internet and E-Commerce sites.	**Internet and Web Browser(25 hrs)** • Configure web browser (2 Hrs) • Search for content using popular search engines (1 Hr) • Use favourite folder for browsing quickly(1 Hr) • Download & Print Webpages (1 Hr) • Create and send e-mail, Reply to an e-mail message and Forward email message (3 Hrs) • Send document/softcopy by email (1 Hr) • Activate spell check using address book and Handle SPAM (1 Hr) • Sorting and search emails.(2 Hrs) • Block emails using filter (1 Hr) • Store download file in mail drives (2 Hrs) • Communicate using text, video chatting and social networking sites (2 Hrs) • Protect the computer against various internet threats (3 Hrs) E Commerce • Browse ecommerce website (1 Hr) • Place order for items(1 Hr) • Add items to shopping Carts (1 Hr) • Do online payment through	**Internet and Web Browser(15 hrs)** • Introduction to Search Engines, • Popular Search engines. • Concept of Favourites Folder. • What is an Electronic Mail. • Email Addressing, BCC and CC, Inbox, Outbox, Address book, SPAM. • Introduction to video chatting tools. • Introduction to Internet Security, Threats and attacks, Malicious Software types, Internet security products and their advantages. • IT Act & Law Introduction to Cyber Security. Introduction to Cyber Laws & IT Act. Importance of privacy and techniques to manage it. E Commerce • Definition of E commerce, Types, scope and benefits of E commerce. • Difference between E commerce and traditional commerce. • Capabilities requirements and Technology issues for E commerce. • Types of E commerce web sites. • Building business on the net.

		payment gateways or other payment method (1 Hr) • Do online Bill payment of service providers (1 Hr)	• Concepts of on line Catalogues, Shopping carts, Checkout pages. • Payment and Order Processing, Authorization, Chargeback and other payment methods. Security issues and payment gateways.
	Project work / Industrial visit		
	Revision		

Syllabus forAdvanced Diploma (Vocational) in "IT, Networking and Cloud"			
Core Module 3 : Web Designing : 320 Hrs			
HOUR No.	**Learning outcome Reference**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		(with indicative Hours)	
641-656	Create simple web pages using HTML 5.	**Hyper Text Mark Up Language (HTML) - (10 Hrs)** • Create HTML document using mark up Tags in HTML editor (Note pad) (1 Hr) • Open/run the html file in web browser to check the output (1 Hr) • Modify above HTML document using heading – paragraphs (1 Hr) • Modify above HTML document using Line Breaks (1 Hr) • Modify above HTML document using HTML Tags. (1 Hr) Skills on elements of HTML • Create Text, Lists, Tables and Frames (2 Hrs) • Create Hyperlinks, Images and Multimedia Working with Forms and controls. (3 Hrs)	**Hyper Text Mark Up Language (HTML) - (6 Hrs)** • Introduction to Internet, browsing, emailing • Introduction to HTML • Different editors used for Webpage Developing - Phase 5 HTML Editor, Programmer's Notepad, SynWrite Editor, PlainEdit.net, Notepad++, jEdit HTML Editor, Sublime Text 2, Sublime Text 2: unofficial documentation, Package Control: packet manager for Sublime Text 2, Adobe Brackets • Application of HTML
657-680	Create Styles of web pages using CSS.	**Cascaded Style Sheet (CSS) - (15 Hrs)** • Create CSS document by using ID selector (1 Hr) • Create CSS document by using Class selector, Universal select or and Grouping selector (1 Hr) • Create CSS document with fonts : Bold, Italics, oblique (1 Hr) • Design Style sheet document with text transformation	**Cascaded Style Sheet (CSS) - (9 Hrs)** • Introduction to CSS • Limitations of CSS • Advantages of CSS • Three ways to integrate CSS • Merits and demerits of - external Style Sheets, Embedded Style Sheets

		:Uppercase, Lower case and capitalize (1 Hr) • Create CSS document with font size in different pixels (1 Hr) • Create CSS document with font weight thinner, thicker, bold (1 Hr) • Create CSS document with alignment centre, right and left (1 Hr) • Create CSS document with background colours and font colours (1 Hr) • Create CSS document with text hovering (1 Hr) • Create CSS document with text decoration (1 Hr) • Create CSS document with block elements and objects (1 Hr) • Create Lists and Tables (1 Hr) • Create Box Model by using borders, Padding and Margin (1 Hr) • Crate CSS document by Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector) (1 Hr) • Creating page Layout and Site Designs. (1 Hrs)	
681-720	Create own account in cloud and hosting.	**Cloud Computing (25 Hrs)** Install Web server in Cloud (5 Hrs) Creating own account in cloud and launch and track no. of visitors (10 Hrs) Hosting in Amazon Web Server (10 Hrs)	**Cloud Computing (15 Hrs)** Introduction cloud computing, Amazon web server (AWS) Industrial Faculty-webinar How cloud and Webinar works

721-800	Configure embedded database with different web pages using Mongo DB	**DBMS with Mongo DB (50 Hrs.)** • Install of MongoDB in the system (2 Hrs) • Create data with the following Data types – String, Integer, Boolean, double, min/max keys, arrays, timestamp, object, Null, symbol, date, object ID, Binary data, Code, Regular Expression (3 Hrs) • Insert Document in database (1 Hr) • Update document in database (1 Hr) • Delete document in database (1 Hr) • Project document in document (2 Hr) • Create a MongoDB query to display all the documents in the collection data (Trainees data) (5 Hrs) • Create a MongoDB query to display the fields id, trainee name, lab name, Certificate No., course title, course starting date, course ending date for all the documents in the collection trainees data. (5 Hrs) • Create a MongoDB query to display the fields id, trainee name, lab name, Certificate No., course name, course starting date, course ending date for all the documents in the collection trainees data, but excluding lab name (5 Hrs) • Create a MongoDB query to display all the trainees who attended course on PHP (2 Hrs)	**Basic Concepts of DBMS (30 Hrs.)** • Purpose of database systems – Data abstraction – Database Users – Data Independence (Logical & Physical) – Instance & Schemes –Three layered Architecture of DBMS – Different Levels of Abstraction. • DATA MODELLING, E-R MODELLING • LOGICAL MODELS: Object & Record based – Object oriented model – Entity relationship models – Entity sets & relationships sets – Attributes — KEYS in entity & relationship sets: (a) super key, (b) candidate key, (c) primary key, (d) unique key — Mapping constraints – E-R Diagrams – Relational Model – Hierarchical model – Network Model. • RELATIONAL DATABASE MANAGEMENT, RELATIONAL ALGEBRA & RELATIONAL CALCULUS RDBMS Technology, The relational Data Structure, Keys, Relational Data Manipulation, The Relational Algebra, Relational algebraic Operations, The Set Operations, Fundamental Operations, Relational Calculus. Data definition language – Data manipulation language –Relational algebra — OPERATORS: select, project, join, rename etc – Simple examples.

		• Create a MongoDB query to display the 1st batch trainees of PHP (3 Hrs) • Create a MongoDB query to display the 2nd batch trainees of PHP (2 Hrs) • Create a MongoDB query to find the course where maximum trainees attended (3 Hrs) • Create a MongoDB query to find lab wise details of trainees (5 Hrs) • Create a MongoDB query with course wise details of trainees (5 Hrs) • Print the queries (5 Hrs)	Introduction to Mongo DB, Advantages of Mongo DB over RDBMS
801-880	Design and develop dynamic websites with PHP.	**PHP (Hyper Text pre processor) (50 hrs.)** <u>Handling Html Form With PHP</u> • Capturing Form Data Dealing with Multi-value filed Generating File uploaded form (3 Hrs) • Redirecting a form after submission (2 Hrs) • Write a PHP script to get the PHP version and configuration information(2 Hrs) • Write a PHP script to display the strings(3 Hr) • Create a simple HTML form and accept the user name and display the name through PHP echo statement(2 Hrs) • Write a e PHP script to display string, values within a table(3 Hrs) • Write a PHP script to count lines in a file(2 Hr) • Write a PHP function to test whether a number is greater than 30, 20 or 10 using ternary operator (3 Hrs)	**PHP(Hyper Text pre processor) (30 Hrs.)** • Decisions and loop - Making Decisions, Doing Repetitive task with looping, Mixing Decisions and looping with Html • Function - What is a function ,Define a function, Call by value and Call by reference, Recursive function • String - Creating and accessing String Searching & Replacing String Formatting String ,String Related Library function • Array - Anatomy of an Array ,Creating index based and Associative array, Accessing array Element, Looping with Index based array, Looping with associative array using each() and for each (), Some useful Library function • Working with file and Directories - Understanding file& directory

		• Write a script which will display the string (2 Hrs) • Write a PHP script which will display the colors (3 Hrs) • Write a PHP script to sorting (3 Hrs) • Write a PHP script to calculate and display average temperature, five lowest and highest temperatures in given data (2 Hr) • Write a program to calculate and print the factorial of a number using a for loop (2 Hr) • Write a PHP script using nested for loop (3 Hrs) • Write a PHP program to generate and display the first n lines of a Floyd (2 Hrs) • Write a function to calculate the factorial of a number (2 Hr) • Write a function to check a number is prime or not (1 Hr) • Write a function to reverse a string (1 Hr) • Write a PHP function that checks whether a passed string is a palindrome or not? (2 Hr) • Write a simple PHP class which displays the given string (2 Hr) • Write a PHP Calculator class which will accept two values as arguments, then add them, subtract them, multiply them together, or divide them on request (5 Hrs) • Write a PHP script to : - a) transform a string all uppercase letters. b) transform a string all lowercase letters. c) make a string's first character uppercase. d) make a string's first character of all the words	Opening and closing a file Coping, renaming and deleting a file, Working with directories Building a text editor File Uploading & Downloading, Using query string(URL rewriting), Using Hidden field ,Using cookies, Using session . • String matching with regular expression What is regular expression, Pattern matching in PHP, Replacing text, Splitting a string with a Regular Expression • Generating Images with PHP - Basics of computer Graphics Creating Image Manipulating Image Using text in Image • Database Connectivity with MySql

		uppercase (5 Hrs)	
881-960	Make websites, web servers, game frameworks, desktop and CLI applications, and IDE using Python.	**Python (50 Hrs.)** • Install Python software in the system (2 Hrs) • Print a string using print statement (2 Hrs) • Print given string using indentation (space between characters) (1 Hrs) • Define Integer Variables, floating variables and string variables(1 Hr) • Write a program to add numbers and strings to the correct list using the append list method(2 Hrs) • Write a python program to add, subtract, multiply and divide given two numbers by using arithmetic operators (2 Hrs) • Write a python program multiplying strings to form string with repeating sequence (2 Hrs) • Write a Python program to get the largest number from a list by using max and mini commands (1 Hr) • Write a Python program to find whether a given number (accept from the user) is even or odd by using if else command (2 Hrs) • Write a Python program to create a histogram from a given list of integers by using for while loop (1 Hrs) • Write a Python program to compute the greatest common divisor (GCD) of two positive integers by using loops (2 Hrs) • Write a Python program to get the least common multiple	**Python (30 Hrs)** Introduction to Python History, Features, Setting up path Basic Syntax Variable and Data Types Operator, Conditional Statements, Looping, Control Statements, String Manipulation, Lists, Tuple, Functions and Methods, Dictionaries, Functions, Modules, Input and Out Put. Exception Handling.

		(LCM) of two positive integers using if else and while commands (2 Hrs) • Write a Python program to sort (ascending and descending) a dictionary by value (2 Hrs) • Write a Python program to create a tuple. (2 Hrs) • Write a Python program to create a tuple with different data types (1 Hrs) • Write a Python program to create a set (2 Hrs) • Write a Python program to add member(s) in a set(1 Hrs) • Write a Python program to find maximum and the minimum value in a set. (1 Hrs) • Write a Python program to find the length of a set (1 Hrs) • Write a Python program to convert temperatures to and from Centigrade to Fahrenheit (2 Hrs) • Write a python program to find Fibonacci series (2 Hrs) • Write a python program to find factorial using function (2 Hrs) • Write a python program to find whether the given string is palindrome or not by using function(2 Hrs) • Write a python class to reverse a string word by word(2 Hrs) • Write a python class named as circle by a radius and two methods of computer area and perimeter of a circle(3 Hrs) • Write a python program to sort a list of elements using bubble sort algorithm(2 Hrs) • Write a python program to	

		copy content ofa file to another file(3 Hrs) • Write a python program to find the frequency of words in a file(2 Hrs)	
	Project work/Industrial visit (optional)		
	Revision		

Syllabus forAdvanced Diploma (Vocational) in "IT, Networking and Cloud"			
Core Module 4 : Web Development : 320 Hrs			
HOUR No.	**Learning outcome Reference**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		(with indicative Hours)	
961-984	Understand how web works.	**Exercise duration: 15 hrs.** • Create web page content using HTML (Hyper Text Mark up Language)Tags(5 Hrs) • Enable Hypertext Transfer Protocol (HTTP) via GET and POST requests (5 Hrs) • Obtain input from users. (5 Hrs)	**Theory duration:9 hrs.** • Learn basic concepts regarding the internet, browsers, and HTML. • Use of HTML (Hyper Text Mark up Language) in web pages. • Protocols • Forms and Input • Database • User Account and security • APIs and Caching.
985-1040	Structuring the web	**Exercise duration :35 hrs.** • Divide a webpage into logical sections (1 Hr) • Set up structure of headings and paragraphs (1 Hr) • Display computer code with HTML (1 Hr) • Annotation of images and graphics. (2 Hr) • Marking abbreviations (1 Hr) • Add quotations and citations to webpages (2 Hrs) • Embed a webpage within another webpage (2 Hrs) • Add Flash content within a webpage (3 Hrs) • Create a data spreadsheet (2 Hrs) • Create HTML tables (1 Hrs) • Optimize HTML table rendering (1 Hr) • Create collapsible content with HTML (1 Hr) • Add context menus to a webpage (2 Hr)	**Theory duration :21 hrs.** • Introduction to HTML • Structuring of web page using HTML • Multimedia and embedding • HTML table and forms • APIs

		• Create dialog boxes with HTML (2 Hrs) • Add multiple languages into a single webpage (2 Hrs) • Controlling of HTML line breaking (1 Hrs) • Mark changes (added and removed text) (2 Hrs) • Add responsive image to a webpage (3 Hrs) • Add vector image to a webpage (3 Hrs) • Add a hit map on top of an image (2 Hrs)	
1041-1120	Scripting and Styling the web (CSS)	**Exercise duration:50hrs** • Apply CSS within a webpage (2 Hrs) • Apply CSS to HTML (3 Hrs) • Select elements via element name, class or ID (2 Hrs) • Select elements via attribute name and content (1 Hrs) • Apply pseudo-elements (2 Hrs) • Specify colors in CSS (2 Hrs) • Debug CSS in the browser (1 Hrs) • Style text and customize a list of elements (2 Hrs) • Add shadows to text (2 Hrs) • Size CSS boxes (2 Hrs) • Control overflowing content (1 Hr) • Control the part of a CSS box to draw the background (2 Hrs) • Create fancy boxes (also see the Styling boxes module, generally). (2 Hrs) • Use background-clip to control background image (1 Hrs) • Change the box model completely using box-sizing	**Theory duration :30 hrs.** • CSS overview • Syntax • CSS values and units • Styling text • Styling box • CSS layout

		(2 Hrs) • Control backgrounds (3 Hrs) • Apply control borders (2 Hrs) • Style an HTML table (3 Hrs) • Add shadows to boxes (2 Hrs) • Calculate specificity of a CSS selector (3 Hrs) • Control inheritance in CSS (2 Hrs) • Apply filters in CSS (2 Hrs) • Apply blend modes in CSS (1 Hr) • Apply CSS multi-column layouts (3 Hrs) • Apply CSS generated content (2 Hrs)	
1121-1200	Enhancing the web using PHP.	**Exercise duration:50 hrs.** • Create a form in PHP and apply validations. (5 Hrs) • Create a date and time from a number of parameters in mktime() (2 Hrs) • Create a date and time from the strtotime() function(2 Hrs) • Create more dates/times from strtotime() (1 Hr) • Output the dates for the next six Saturdays (3 Hrs) • Output the number of days until 10th of July (2 Hrs) • Create and retrieve a cookie(5 Hrs) • Modify a cookie value (2 Hrs) • Delete a cookie (1 Hrs) • Check if cookies are enabled (2 Hrs) • Select data with MySQLi (Object-oriented) (5 Hrs) • Select data with MySQLi (Object-oriented) and put result in an HTML table (10 Hrs) • Select data with MySQLi	**Theory duration:30hrs.** • PHP Fundamentals overview • PHP Forms, files and cookies • Form validations • Introduction to PHP Script • Looping statement in PHP Script • Working with Predefined functions • Maintaining Validations in PHP Script • Working with Different types of Mouse Events • Object Oriented Programming and PHP 5 • Debugging PHP Code • PHP Session Handling Features • Smarty installation • Handling Date & Time in PHP • Installing and Managing MySQL (access control & overview) • Understanding and using MySQL clients • Database Access, Design Patterns, Mail Function, PEAR and cURL

		(Procedural) (5 Hrs) • Select data with PDO (+ Prepared statements) (5 Hrs)	
1201-1280	Java: The key language	**Exercise duration 50 hrs.** • Write a Java Programme to print Hello on Screen (2 Hrs) • Write a Java Program to find arithmetic Operations (1 Hr) • Write a Java Program to find biggest no. in given three nos. (2 Hrs) • Write a java program to print Fibonacci series without using recursion and using recursion (2 Hrs) • Java Program to Solve any Linear Equation in One Variable(3 Hrs) • Java Program to Find Inverse of a Matrix (3 Hrs) • Java Program to Perform Encoding of a Message Using Matrix Multiplication (2 Hrs) • Write a Java program to sort a numeric array and a string array (2 Hrs) • Write a Java program to remove a specific element from an array (3 Hrs) • Write a Java program to get the minimum value of year, month, week, date from the current date of a default calendar (2 Hrs) • Perform animation in applet (3 Hrs) • Write a java program to paint like paint brush in applet (2 Hrs) • Program to display analog clock in applet (3 Hrs) • Program to communicate two applets (3 Hrs) • Write a Java program to	**Theory duration:30 hrs.** • Introduction to Java programming • The Java Virtual Machine • Variables and data types • Conditional and looping constructs Arrays • Object-oriented programming with Java Classes and Objects • Exception handling with try-throw-catch-finally constructs • Working with types: Wrapper classes • Packages • Applets • Basics of AWT and Swing • Threads • Concepts of networking

		convert a hash set to a tree set (2 Hrs) • Create runnable jar file in java? (3 Hrs) • Display image on a button in swing (2 Hrs) • Program to change the component color by choosing a color from ColorChooser (2 Hrs) • Program to create a notepad in swing? (3 Hrs) • Program to inherit Frame class (2 Hrs) • Program to perform two tasks by two threads (3 Hrs)	
	Project work / Industrial visit		
	Revision		

Syllabus forAdvanced Diploma (Vocational) in "IT, Networking and Cloud"			
Core Module 5 : Business Data Analytics : 320 Hrs			
HOUR No.	**Learning outcome Reference**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		With Indicative Hours	
1281-1360	Understand business analytics and develop business intelligence.	**Introduction to Business Analytics Overview (50 Hrs.)** • Use Excel for under standing different types of data (Integer, double, text, date) (5 Hrs) • Perform operations on different data types. (5 Hrs) • Segregate data in different sheets. (5 Hrs) • Calculate arithmetic mean, geometric mean and Harmonic mean (5 Hrs) • Calculate median from raw & grouped data (5 Hrs) • Calculate mode for row & grouped data (5 Hrs) • Calculate standard deviation for set of data (5 Hrs) • Calculate standard variance for a set of data (5 Hrs) • Online analytics processing using (OLAP) tools. (5 Hrs) • Use OLTP for CRM and retail sales using web focus info assist or Excel (5 Hrs)	**Business Analytics (30 Hrs.)** Introduction to business analytics and concepts of business analytics. Trends in business analytics. Descriptive analytics: Introduction to statistics, Types of data, Measure of Central Tendency, Mean – Arithmetic mean, Geometric Mean, Harmonic Mean, Median – Raw and Grouped Data and Mode - Raw and Grouped Data, Measure of Dispersion – Standard deviation, Variance, properties of variance and standard deviation and its usage in business, analytics project. Concepts on OLAP and OLTP
1361-1440	Analyze data using statistical and data mining techniques for business intelligence.	**Business Analytics Foundation (50 Hrs.)** • Segregate structured data & un structured data (5 Hrs) • Exercises on data integration (5 Hrs) • Exercises on data clearing (5 Hrs) • Create data dimension (5 Hrs) • Exercises on data ware housing.(5 Hrs)	**Business Analytics Foundation (30 Hrs.)** BI component framework, business intelligence for management, operational BI, BI for process and performance improvement, Role of Business Intelligence in Improve customer experience, business intelligence role and responsibilities, Popular BI

		• Exercises on data visualization (5 Hrs) • BI case studies to improve customer experience in roles & responsibilities. (5 Hrs) • Case studies on self service& collaborative BI (5 Hrs) • Exercises on BI strategies (5 Hrs) • Exercises on BI project management (5 Hrs)	tools in the market.
1441-1520	Understand case studies for predictive models.	**Predictive analytics modeler I (50 Hrs.)** • Exercises on data representation & cluster analysis (2 Hrs) • Case studies on different patterns of data (3 Hrs) • Case studies on pre processing the data (2 Hrs) • Case studies on transforming the pre processed data (3 Hrs) • Case studies on segregating preprocessed data into different patterns. (2 Hrs) • Case studies on Evaluating the data patterns (3 Hrs) • Case studies on Tread Analysis. (2 Hrs) • Case studies on statistical approach for data mining through (3 Hrs) • Bayesian network (5 Hrs) • Regression Analysis (5 Hrs) • Correlation Analysis (5 Hrs) • Cluster Analysis (5 Hrs) • Case studies on CRISP – DM model (5 Hrs) • Case studies on data partitioning. (5 Hrs)	**Predictive analytics modeler I (30 Hrs.)** Concept of data mining techniques, concepts of data mining model with its development and deployment in business scenario. Data mining models – CRISP-DM model, understanding of data and its preparation techniques for the better model building, introduction to sampling and data partitioning in data mining project
1521-1600	Develop case studies for predictive analytical	**Predictive analytics modeler II (50Hrs.)** • Exercise for machine learning approach :(15 Hrs)	**Predictive analytics modeler II (30 Hrs.)** Concepts of machine learning approach for data mining

	models.	I. Case studies on Decision tree induction method II. Case studies on inductive concept learning III. Case studies on conceptual cluster learning. • Exercise on data base oriented approach :(15 Hrs) I. Case studies on attribute – oriented induction II. Case studies on iterative database scanning III. Case studies on attribute focusing • Exercise on other approaches (10 Hrs) I. Case studies on neural networks II. Case studies on Rough sets. III. Case studies on Visualisation. • Case studies on odds and odds ratio (10 Hrs)	using decision tree inductive concept, conceptual cluster, attribute oriented induction, iterative database scanning, attribute focusing, neural networks, rough sets, visualization. Concepts of odds and odds ration
	Project work / Industrial Visit		
	Revision		

Syllabus forAdvanced Diploma (Vocational) in "IT, Networking and Cloud"			
Elective Subject 1 : Cloud Application Developer : 320 Hrs.			
Hour No.	**Learning outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		(with indicative Hours)	
1-200	Understand the Cloud architecture patterns, Working with the WebSphere /Deployment environment.	Following operations will be performed on the Cloud platforms: (30Hrs) • Overview of cloud platform dashboards. (IBM Blue mix) • Operations like creation, launch, security, and cleaning of instances will be performed. Skills on Essentials of Cloud Application Development on IBM Bluemix (35Hrs) • Bluemix and the Cloud Foundry command line interface (CLI) • Develop Bluemix applications with Eclipse • Develop Bluemix applications with IBM Bluemix DevOps services • Bluemix with Cloudant • Build a mobile data Bluemix application • Extend the Bluemix mobile data application to access it from a mobile web application Skills onDeveloping Cloud Applications with IBM SDK for Node.js (30 Hrs) • Set up your Node.js development environment in IBM BlueMix • Asynchronous I/O with call-back • Node packages	(**75 Hrs of Theory)** • Introduction to cloud and IBM Bluemix services • Getting started with IBM Bluemix and develop Bluemix applications on a local workstation • Introduction to data services in IBM Bluemix and Mobile Data services • Introduction to server-side JavaScript and Express: a web application framework • Overview of the Liberty profile along with Deploying applications to the Liberty profile

		Skills onWorking with Liberty Profile on Bluemix (BYOE) (30 Hrs) • Getting started with the Liberty profile • Binding the Bluemix Liberty Profile to a MongoDb service • Working with the Liberty profile	
201-320	Develop Cloud applications.	Projects:(120Hrs) • Develop an application using Node.js Example: 1.Simple Chat application 2. Hello World Deploy the created application into Liberty profile	
	Revision		

Syllabus forAdvanced Diploma (Vocational) in "IT, Networking and Cloud"			
Elective Subject 2: Cloud Enterprise Developer: 320 Hrs.			
Hour No.	**Learning outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		(with indicative Hours)	
1-200	Build a web application with the Express framework, Use Web Sphere Development Tools to deploy applications to a server.	Skills onMigrating Application to the Cloud on Bluemix (50Hrs) • Setting up the environment • Deploying Tomcat application to Bluemix • Installing and running the migration analysis tools • Creating a database service in Bluemix • Deploying the application in Bluemix • Testing the application • Deleting the application • Installing a local Tomcat server into Eclipse • Importing and running the application in Eclipse • Running the cloud migration analysis tools • Analyzing the results • Creating database service in Bluemix • Deploying the application in the cloud • Testing your application (optional) • Deleting the application • Running the document manager application on-premises • Setting up the migration environment • Migrating the server configuration by using the configuration migration tool. • Importing and analysing the application • Migrating the application	**(75 Hrs of Theory)** • Migrating application to Bluemix • Additional considerationsCode commit • Code deploy • Code pipeline • Kudu • Cloud & cyber Security(Advance) • Bluemix integration • Secure gateway • API and data integration

		• Deploying the application to Bluemix Skills on Cloud & cyber Security (Advance) (25 Hrs) • Setting up security functionalities • Setting up of alarms Skills on Integration of Bluemix Applications with On-premises Resources On-premises Resources (50Hrs) • Building an IBM Container that represents a back-end system • Testing the application • Setting up the Eclipse development environment • Setting up IBM Secure Gateway • Defining JDBC access through IBM Secure Gateway • Enabling REST, Web Services, and JMS access through IBM Secure Gateway • Establishing Client TLS • Establishing Application TLS • API Management • Connect & Compose • DataWorks • User-defined services • Cleaning up your resources	
201-320	Deploy cloud application and cloud integration.	Projects: (120 Hrs) Create a small project using java or use an already created application to deploy the application on Bluemix platform. Case study: Security breaches • Security functionalities on different cloud platforms. Develop a security and integration framework of the application /project deployed on Bluemix platform.	
	Revision		

Syllabus forAdvanced Diploma (Vocational) in "IT, Networking and Cloud"			
Elective Subject 3 : Web Development using Java : 320 Hrs.			
Hour No.	**Learning outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		(with indicative Hours)	
1-80	Develop the real time scenarios based on OOPs concepts and Java .	**JAVA Programming through OOPs Concepts (50 Hrs)** • Write a program to demonstrate encapsulation & Write a Java program to print 'Hello' on screen and then print your name on a separate line. (1 hr) • Write a program in Java to display the pattern like right angle triangle with a number. (1 hr) • Write a program to demonstrate static and dynamic polymorphism. (2 hrs) • Write a program to demonstrate method overloading and overriding (1 hr) • Write a program to create a constructor for a class. (1 hr) • Write a Java program to sort ascending / Descending of given array (1 Hr) • Write a Java program to add two matrices (1 hr) • Write a Java program to test the equality of two arrays (1 Hr) • Write a Java Programme to find that the given string is Palindrome ? (1 Hr) • Write a program to create wrapper classes. (2 hrs) • Write a program to demonstrate single level, multiple level inheritance. (3 hrs) • Write a program to demonstrate super keyword (2 hrs) • Write programs to demonstrate the interfaces in java (3 hrs)	**(30 Hours Theory)** • Introduction to java, Difference between structural programming and oops programming, OOPs concepts, Encapsulation, Class & Objects, Hello.java,Java environment setup, compilation & execution. • Java primitive data types including int, float, char, String, Boolean, and double. • Define Java constants. Declare, assign, and initialize variables. • Write simple arithmetic statements. Understand operator precedence. • Understand arithmetic and logical operators. • Explain the difference between primitive and reference data types • Use Java decision structures including IF, IF...ELSE, nested IF, and Switch statements. • Use Java logical operators including AND, OR, and the conditional NOT • Polymorphism : Static & Dynamic Polymorphism. • Constructors, Difference between constructors and functions.

		• Write programs to demonstrate the abstract class in java (2 hrs) • Write program to create and use a package in java (3 hrs) • Write a program to demonstrate inner classes in java (2 hrs) • Write programs to demonstrate try-catch blocks in java (3 hrs) • Write program to demonstrate throws keyword in java (2 hrs) • Write program to demonstrate finally keyword in java (2 hrs) • Write a program to Create user defined exceptions in java (1 hrs) • Write a program to demonstrate multi-threading in java (2 hrs) • Write a program to create login page using java AWT (3 hrs) • Write a program to create different grid layouts using java AWT (2 hrs) • Write a program to create job Registration form using java AWT (3 hrs) • Write a program to handle the events for "Sign UP" and "Login" button clicks (2 hrs) • Write a program to handle the events in registration form (3 hrs)	• Declare and initialize a Java array. • Understand the concepts String manipulation. • String class & string buffer class. • Wrapper Classes • Inheritance: Single level, Multi level, Multiple. • Super Class • Interfaces • Abstract Classes • Packages • Access Specifier • Inner Classes • Exception Handling • Java AWT. • Event Handling in java.
81-160	Develop Web pages using Java.	**Java Servlets. (50 Hours)** • Write simple Servlet Hello World, compile and deploy it (2 hrs) • Write simple Servlet program to pass and read values to Helloform using GET method.(3 hrs) • Write simple Servlet program to pass and read values to Helloform using POST method.(2 hrs) • Write a simple Servlet program to read values from check box. (3 hrs) • Write a servlet program to read HTTP header information. (2 hrs) • Write a servlet to send 407 error code to client browser and to	**(Theory 30 Hours)** • What is servlets, Servlet package. • Setting up servlet environment, servlet life cycle. • Servlets form data. • Servlet client HTTP request, HTTP server response. • Status codes. • Filters. • Exception Handling. • Cookies & Sessions. • Database connectivity.

		display message as "Need Authentication!" (3 hrs) • Write Servlet program to print client IP, Date & Time using servlet filters. (5 hrs) • Write a program to perform basic exception handling in servlets. (5 hrs) • Write a servlet program to set cookies to First name, Second Name, Mobile No, Email ID fields in a form. (5 hrs) • Write a servlet program to read cookies names and values. (2 hrs) • Write a Servlet program to display the session information of webpage. (3 hrs) • Write a servlet program to access employees table from database. (5 hrs) • Write a servlet program to edit, update and delete employees information in database. (5 Hrs) • Write a servlet program to display current data & time on webpage.(2 hrs) • Write a servlet program for auto page refresh. (3 hrs)	• Servlets date & time. • Auto page refresh.
161-240	Establish database support for dynamic WebPages.	**JDBC(50 Hours)** • Create a connection to database (MS-Access/MySQL/Oracle) using JDBC. (3 hrs) • Create a database using JDBC. (2 hrs) • Select database using JDBC application. (2 hrs) • Drop existing database using JDBC application. (1 hrs) • Create statement and result set. (2 hrs) • Create a table using JDBC application. (3 hrs) • Delete the table using JDBC application. (2 hr)	**(Theory 30 Hours)** • What is JDBC, JDBC architecture. • JDBC Package, JDBC-SQL-syntax. • JDBC Environment setup. • Creating JDBC application. • JDBC Driver and its types. • JDBC connections, statements, result sets, data types. • Exceptions.

		• Insert the records using JDBC application. (5hrs) • Select the records using JDBC application. (5 hrs) • Edit & Update the records using JDBC application. (5 hrs) • Delete the record using JDBC application. (3 hrs) • Conditionally Select the records from table by WHERE clause using JDBC application. (2 hrs) • Conditionally select the records from table by LIKE clause using JDBC application. (2 hrs) • Sort the records using JDBC application. (3 hrs) • Store the image in database using JDBC application. (5 hrs) • Retrieve the image from database using JDBC application. (5 hrs)	
241-320	Develop Website using Java and deploy in cloud.	Projects: (120 Hrs) Create a simple organization website with employee registration and login	
	Revision		

9.SYLLABUS – EMPLOYABILITY SKILL

Learning Outcome	**1. Leadership Skills** **Duration : 20 Hrs.**
1. Exhibit leadership qualities and entrepreneurship skills.	Leadership - Define leadership, types of leadership, leadership Traits, Functions of leadership, styles of leadership. Resolving Individual differences among people.
	Risk Analysis tools; estimate the risks that you could face in your role. In turn, this helps you manage these risks and minimize their impact on your plans. Break-even point analysis. Risk Value = Probability of Event x Cost of Event.
	Success stories / Best Practices – Inspection, inspect Demo displacement. Innovation has become one of the most popular buzz words of the Digital Age. Re-evaluate the true meaning of a concept than when it is being touted by individuals and companies around the world. Spark innovation, maximize productivity, and increase profitability as a result of implementing the Big Five behaviors.
	Stress management - Define Management, Type of stress Management, How to improve stress in workplace, Team leader in workplace.
	Manage relationships with client who may be confused with the services requirements. Build healthy client relationships and use customer centric approach.
	2. Entrepreneurship Skills **Duration : 20 Hrs.**
	Self Employment as a Career path - Define Entrepreneurship, Strategy of entrepreneurship, Market Research. Implementation of self Employment in workplace Ps, Mange self employment in workplace. Quality consciousness – its relevance.
	Study of Competitive Advantage Model. PEST factors for external changes and implement VRIO resources for getting an edge over the competitors.
	Ensure that environmental conditions are suitable for the client and the services to be carried. Deal with clients lacking the technical background to solve the problem on their own.
	Immediate or temporary solutions to resolve delays.

	5 Strategies of handling sensitive issues (political, commercial, environmental, cultural, and so on) at workplace – 1. Define the issues, 2. Develop Policies Adhering to Company Goals, 3. Communicate Policies, 4. Hold People Accountable and 5. Continue to Evolve.
	Define marketing; Tools of marketing, 7 Ps define market strategy, important of market strategy, use of strategy in trade theory (Labour Market Information).
	3. Organizational Skills **Duration : 20 Hrs.**
2. Apply organisational principles and practices using creative abilities and digital skills.	Training & Managerial responsibilities Introduction & discussion on managerial responsibilities.
	Basic quality Concept & 5'S Colour Dynamics
	Follow the organisation's policies and procedures for working with colleagues.
	Time management - Workplace time Management, maintain Time management, Benefits of Time Management in workplace, Time management schedule.
	4. Creative Abilities **Duration :20 Hrs.**
	Boosting Morale - Boosting ethics & Development work environment, ethics theory, Development of work environment & training process, knowledge of presentation &self motivation.
	Five Dimensions to conceptualize your idea to make it a successful innovation. When conceptualizing an idea, it is essential to ask questions like what is the problem that the idea solves, who is the consumer for the idea, does the idea solve the consumer's problems and how will the solution be delivered to the consumer. It is very important to direct the thinking to specific dimensions and search answers to certain questions that help in evolving the idea from the initial thought through the various

	stages of innovation.
	The single most effective way to come up with a business idea is to solve a problem. Next step, you bring the idea to life. Whether it's code, carpentry, or culinary, a project is a created idea. When the project is nearly complete and it's time to begin putting the project into the hands of real people. Once your project is perfected through testing, it's time to come up with a way to make money from it. Growth - Get the word out about the thing.
	5. Digital Skills **Duration : 20 Hrs.**
	Write memos and e-mail to customers, co-workers, and vendors to provide them with work updates and to request appropriate information.
	Operate all types of digital tools like laptops, palmtops, mobiles, fax machines, printers, projectors, conferencing tools effectively.
	Attributes that feature in the emergence of novel technologies are: (i) radical novelty, (ii) relatively fast growth, (iii) coherence, (iv) prominent impact, and (v) uncertainty and ambiguity. The framework for operationalising emerging technologies is then elaborated on the basis of the proposed attributes.
	Understanding and adhering to the Information security aspects of the organization based on ISP. Information Security Policy (ISP) is a set of rules enacted by an organization to ensure that all users or networks of the IT structure within the organization's domain abide by the prescriptions regarding the security of data stored digitally within the boundaries the organization stretches its authority.
	Create or convert textual contents into graphical representation, charts, diagrams and flow charts. Learn to make graphs and charts in MS excel. Use of digital camera and other imaging tools. Use of MS-Power point for developing diagrams and flowcharts.

	6. Self-Management **Duration : 20 Hrs.**
3. Organize work efficiently by self-management and effective communication.	Decision making pertaining to the concerned area of work. Decision making process.
	Identifying the strengths - SWOT Analysis. Define Swot analysis, Important of swot analysis, characteristics of swot analysis, Example of swot analysis related with Trade development in detail
	Apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action.
	Use of multi-model strategies of articulation such as audio visual tools, kinaesthetic learning tools, etc.
	7 thoughts on taking responsibility at workplace- 1. There is always a price to pay. 2. Build your self-esteem.3. Give yourself the permission to work as you want.4. Taking actions 5. Understand the limits of your responsibility. 6. Don't forget to take responsibility in everyday work life. 7. Aim to be your best self.
	7. Plan and organize the work related to the occupation **Duration : 20Hrs.**
	Prepare and organize service feedback files/documents.
	The best way is to plan for workplace/ assembly location is to think of any emergency situation before it happens. Think clearly and logically in a crisis, so it is important to do so in advance with due consideration of the operational stipulation.
	Question-answer session to be conducted appropriately in order to understand the nature of the problem and make a diagnosis of the task.
	Guidelines for delegating roles and responsibilities to co-trainees: 1. Identify key opportunities for delegation, 2. Establish a clear set of objectives for each task, 3. Play to your coworker's strengths, 4. Construct a timeline, 5. Use follow-up tasks to keep your workers on point, 6. Establish authority and respect, 7. Use a feedback loop to make future delegation easier.

	8. Effective communication (written and verbal) **Duration : 10 Hrs.**
	Communication process & elements of communication. Maintain clear communication with colleagues (by all means including face-to-face, telephonic as well as written). Pass on information to stakeholders in line with organisational requirements both through verbal as well as non-verbal means. Principles of effective communication, body language, handling nervousness/ discomfort and dealing with barriers.
	Different Types of Communication Aids: Projected/ Non Projected using different types of board in a class room session. Black board, White board, Flannel board, Magnetic board etc. Application, use & maintenance of OHP, Digital Camera, LCD projector and Smart board. Preparation of slides in MS-Powerpoint and presentation of the slides. Handle FAQ session during meetings.
	9. Emotional intelligence **Duration : 10 Hrs.**
4. Implement Continuous Professional Development (CPD) using emotional intelligence.	Work with colleagues to integrate work. Work in ways that show respect for colleagues.
	Getting it right from the very beginning, you'll most likely see things flourish. Spending ample time collecting information, allow client to share their knowledge and participate in the project.
	Adopt a flexible attitude, learn about the culture beforehand, expect differences, understand hierarchies, be upfront about difficulties in communication, be respectful & tolerant and be patient.

ANNEXURE-I

List of Tool & Equipment

1. **Trainees Tool Kit (For 30 Trainees + 1 Trainer)**

S No.	Name of the Item	Specification	Quantity
1	Connecting screwdriver	100 mm	31 Nos.
2	Neon tester	500 V	31 Nos.
3	Screw Driver Set (set of 5)		31 Nos.
4	Insulated combination pliers	150 mm	31 Nos.
5	Insulated side cutting pliers	150 mm	31 Nos.
6	Long nose pliers	150 mm	31 Nos.
7	Soldering iron	25 W. 240 V	31 Nos.
8	Electrician knife		31 Nos.
9	Tweezers	100mm	31 Nos.
10	Digital Multimeter		31 Nos.
11	Soldering Iron Changeable bits	15 W	31 Nos.
12	De- soldering pump		31 Nos.

2. **List of Tools required**

Sl. No.	Name of the Item	Specification	Quantity
1	Crimping tool (pliers)		3 Nos.
2	Soldering Iron	25W	9 Nos.
3	Screw driver	150mm	6 Nos.
4	Allen Key set (set of 9)		3 Sets

3. **Tools & Equipment**

Sl. No.	Name of the Item with Specification	Specification	Quantity
1	Server Computer Make-HP, Model-HPE ML150 Gen9, Max Scalability-2, Configured-Intel® Xeon® E5-2609v4, Memory Max Scalability-16 DiMM Slots, Memory Configured-16 GB DDR4-2400 R Memory, Max Scalability-4LFF(3.5inch) Hot Plug Drive, Configured-Open Bay, HP H240 12Gb 2-ports Int Smart HBA, HP SATA 9.5 JB Optical HDWR, Max Scalability-Hot Plug| Hot Swap, Configured-2 x HP 900W AC 240VDC Power	1.7GHz/8-core/20MB/85W	01 No.

	Module, Network Controller-Broadcom 5717 Dual-port 1Gb, Management-HP iLO (Firmware: HP iLO 4), Additional HDD-HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive, Additional OS-Windows Server R2 STD 2012 & No Cal(ROK), K.B. & MOUSE with 20" LED Monitor.		
2	Desktop Computer	Intel Core i5-6500 Processor / Q 170 chipset / 4 GB DDR4 Ram / 1 TB HDD / DVD R/w / 19.5" TCO Certified / 30 L MT CHASSIS / Three Years On-site warranty/ 90% Power Efficiency/ USB Keyboard &Mouse .	30 Nos.
3	Laptop(Intel corei5/ 7200/ 8 GB/ 1TB/ DVD/ 14.1" Screen/ Win 10 Pro)Processor Generation - 7th Processor - Intel Core i5-7200U (upto 3.1 GHz, 3 MB cache, 2 cores), Graphics Type – Integrated, Graphics Memory -	GB Hard Disk Drive Size - 1000 GB.	01 No.
4	Laser Jet Printer:Print Speed (A4)- Mono – 25 PPM, Print Speed (A4)-	Color - 10 PPM, Network Capability, Simplex, Paper Size - A4.	01 No.
6	Network Printer: Print Speed (A4)- Mono - 35 PPM Print Speed (A4)- Color - 0 PPM Network Capability Simplex ,Paper Size –A4,A3,	1200x1200 dpi , 256 MB Memory.	01 No.
7	5 KVA online UPS		As required
9	DLP Projector: Front Projection Method, Native Resolution - Brightness - 4000 Lumens, Zoom Feature, Aspect Ratio - 4:3.	1024 x 768 (XGA)	01 No.
10	Power Meter		01 No.
11	Crimping Tools		15 Nos.
12	Computer Tool Kits		07 Nos.
13	Mother Boards (of different types)		07 Nos.
14	Cabinets		07 Nos.
15	Processors (of different make)		07 Nos.

16	Hard Disk	500 GB	07 Nos.
17	Optical Drives		07 Nos.
18	LCD/LED Monitors: Screen Size (Diagonal) - 45.5 - 47.5 cm, Panel Type - Twisted Nematic (TN) , Resolution - 1366 x 768 Pixels , Brightness - 200 Nits, Response Time - 10 millisecond		07 Nos.
19	Pen Drives		04 Nos.
20	External Hard Disks:	500 GB,Read speed - 300 mbps, Write speed - 200 mbps, Interface - USB 2.0.	02 Nos.
21	External DVD Writer: Type - AC adapter, Nominal Voltage - 230 V/AC, Fixed output connecter, Output cable length	8.1.14 cm.	05 Nos.
22	Keyboards		07 Nos.
23	Mouse		07 Nos.
24	Anti Static Pads		07 Nos.
25	Anti static wrist wraps		07 Nos.
26	SMPS		07 Nos.
27	Blue-Ray drive and player		02 Nos.
29	Network storage		02 Nos.
30	Card reader		02 Nos.
31	Game Video card		02 Nos.
32	Surround sound Speakers		02 Nos.
33	Web Cam: Type of Video Conferencing System - End point based, Minimum Bandwidth - .384 Mbps, PCM Supported Audio Coding Standards.		02 Nos.
34	Different types of memory cards		02 nos. each
35	Laptop Kits		12 Nos.
36	Laptop spares – Cabinet with display, memory, hard disk, battery pack, keyboard membrane, chargers		As required
37	Air Conditioners 1207 CFM, Dual Rotary Compressor.	(1.5 Ton): Split AC, 1.5 ton,	As required
38	Scanner		01 No.
39	Modem		01 No.
40	Telephone Line		01 No.
41	Broad band Internet Connection		01 No.
42	Fire Fighting Equipment		02 Nos.
43	Hardware & Network Trainer Kit		05 Nos.
44	Wireless Network Adaptor		15 Nos.

45	Wireless Access Point		05 Nos.
46	Router		05 Nos.
47	Managed Layer	2 Ethernet switch 24 port	02 Nos.
48	Managed Layer	3 Ethernet switch 24 port	02 Nos.
49	Network Training System		02 Nos.
50	LAN Protocol Simulation and Analyser Software		02 Nos.
51	Network and Internet Security Trainer		02Nos.
52	LAN cable tester		02 Nos.
53	Network Cables – UTP, Coaxial, flat , ribbon		As required
55	Connectors for cables		As required
56	Media Converter		04 each
57	24 port UTP jack panel		02 Nos.
58	SC couplers		10 Nos.
59	SC Pigtails		10 Nos.
60	RJ-45 Connectors		As required
61	Fluke Meter		02 Nos.
62	Switch with POE ports		02 Nos.
63	POE adaptors		02 Nos.
64	Network Camera (outdoor/indoor)		02 No. each
65	Hand Held Vacuum cleaner		01 No.

4. List of Software

S No.	Name of the Item with Specification	Specification	Quantity
1	HTML-5, CSS, PHP, Python, My SQL, Mongo DB, Java, Linux		All Open Tools
2	Antivirus (20 user license)		01 No.
3	Network Management Software		01 No.
4	Data Recovery software		01 No.
5	MS Windows 20 user license		01 No.
6	MS Office 20 user license		01 No.
7	IBM Blue Mix Platform		30 users
8	Azmazon Web Server		30 users
9	High Bandwidth Internet Connection		30 users
10	Common Linux Software packages – alsa-lib, grep, LDAP		1 No. each
11	Windows Server 2003/2008		1 No.
12	Windows 7 after versions 64-bit, 3GHz minimum quad-core processor		1 No.
13	SQL Server		1 No.
14	Tomcat Server/ISS Server		1 No.

Furniture

S No.	Name of the Item with Specification	Specification	Quantity
1	Pigeon hole cabinet :	30 compartments	01 No.
2	**Faculty table:** wood desk with a clean top for more working space Neat wiring flow with cut-outs on the sides Free standing, Pedestal for adequate personal storage. Work Desk 1 : 1200(w)x600(d)x740(h) Work Desk 1 : 1500(w)x750(d)x740(h) Pedestal : 404(w)x460(d)x685(h) **Faculty Chair:** Ergonomically contoured chairs for perfect back support, Height adjustable back to adjust personalized lower back, Height adjustable arms, Seat depth adjustment for perfect thigh support, GREENGUARD Certified.	Model: Versa, 76.1cm (w)x 76.1 cm(d)x97.3c m – 114.8 cm (h)x 43.6 cm – 53.6 cm (seat height)	01 each (for class room & laboratory)
4	Functional 2 seater Desk-cum-Bench solution with shelf for trainees	Model : Scholar, width 1048 mm, Depth : 895 mm and Height 750 mm	15 Nos.
5	Computer Table with top made-up of 15mm Medium Density Fibre, all the other panels are made of Particle board, with vacuum lamination with appropriate lapping	Model : caliber 201, Width : 645mm, Depth : 480mm, Height : 735mm	30 Nos.
6	Operators chair with Backrest height Adjustment ,Pivoted backrest, Plastic Back Cover, Footrest Assembly, Moulded Foam, Pneumatic height adjustment, Swivel Mechanism, Twin wheel castors	Model Pch 4103, Width : 65 cm, Depth 65 cm, Height 68-89.5 cm, seat height 44-56.5 cm	30 Nos.
7	Printer table can be varied as per local specifications	650X500X750mm	03Nos.
9	Storage cabinet	60X700X450mm	01No.
10	White Board : Aluminum material wall mounted Erasable white board is dent and scratch free, Magnetic surface to easily display posters, Porcelain on steel,	72.0" (w) x 48.0" (h), weight 49.0lbs, Magnet Receptive, white color.	01 No.
11	Steel Almirah :Storwel Plain	916 cm (w) x 486 cm (d) x 1981 cm (h)	01 No.

ANNEXURE-II

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:	**Examination:**	**Duration of the Trade/course:**
Learning Outcome:		

S 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														