# CHM-A level

## A1: Advanced PC Hardware and Networking Components (Duration 60 Hours)

**Subject Prerequisites:**
Candidate should have basic knowledge of troubleshooting desktop PCs, Fundamentals of wireless communication technologies available in the market. Also have some level of hands on practice for driver installation, configuration basic wireless networks.

**Subject Outcome:**
Candidate should able to handle and repair laptops, tablets, identify the faults and troubleshoot. candidate should be able to establish secured wireless network for given assignment.

| Section | Brief Contents | Duration (Hrs) |
|---|---|---|
| **1. Introduction to Portable Mobile Computers, Laptops, Tablets** | Types and classes of portable computers: - Laptops, Notebooks, Tablets, Smart Phones, Palmtops. Portable System models and configurations from different manufacturers: - IBM, DELL, Apple, Samsung, HP, Toshiba, Fujitsu, Acer, Compact Version Operating Systems and applications for portable Computers: - WINDOWS 8, Android and various various releases, various flavors of Linux that being loaded on handheld devices, Apple Macintosh and iOS. Low powered Portable system Processors and Graphics Processors GPU:- Intel Mobile Pentium, Mobile Celeron Processors, ARM Cortex processors, AMD Mobile Athlon-4 and Mobile Duron. Mobile processor packaging and compact Motherboards. | 10 |
| **2. Compact devices used in Portable Mobile Computers** | Compact Hard Drives, CD/DVD R/W used in Mobile computers. Various type of secondary memory deployed in compact devices like Compact FLASH, MicroSD Cards, Wireless blutooth based Keyboards and mouse: - Inbuilt and External keyboards, Compact multimedia keyboards, TrackPoint, Touchpad's, Wireless mouse. | 5 |
| **3. Specialized output devices used in Portable Mobile Computers** | Display used in portable computers:- Dual Scan( passive Matrix) Displays. Active Matrix, Flat- Panel LCD/LED/AMOLED/IPS Displays, Active TFT Displays, touch panel, etc. | 5 |
| **4. Interfacing used with Portable Mobile Computers** | PCMCIA Cards:- PCMCIA Ethernet LAN card, PCMCIA Wireless Card. Type –I, Type –II Type –III types of cards, and their slots. Infrared ports, Docking Stations, USB port, OTG USB, Mini USB, HDMI, micro HDMI port, etc | 3 |
| **5. Preventive maintenance for** | Power Supply constraints, Battery charging, Handling and Storage, Cleaning of Displays, Running diagnostic | 2 |

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| **Portable Mobile Computers** | software tools, Antivirus Software, Handling Plug-in /Plug-out Hardware. | |
| **6. Portable Mobile Computers in wireless LANS** | Wireless Standards :- IEEE 802. 11(a/b/g/n/ac), 802. 16 (Wi-max) RF Data Communication. Types of wireless networks IBSS Ad-Hoc, BSS and ESS Network Fundamentals and deployment, Key Characteristics of 802. 11 Wireless LANs, Typical Range of 802. 11a/b/g/n/ac WLAN, Access Point, Bridging, Wireless Router A WLAN Architecture, Typical Bluetooth Network—A Scatter-net, Bluetooth Ad Hoc Topology, Bluetooth Operating Range, Key Characteristics of Bluetooth Technology, Device Classes of Power Management. Introduction to Wireless Communication NFC. Emerging Wireless Technologies, wireless Internet, e-mail, and global positioning system(GPS) capabilities. General Packet Radio Service (GPRS), Enhanced Data GSM. Environment (EDGE), and Universal Mobile Telecommunications Service (UMTS), Wimax, LTE 4G services in mobile communication. Wireless Security Threats, Authenticity, Authorization, Accountability, Wireless Security of 802. 11b/g/n/ac in Typical Network, Taxonomy of 802. 11 Authentication Techniques, Shared-key Authentication Message Flow, WEP Privacy Using RC4 Algorithm, Taxonomy of Security Attacks. Encryption Algorithms WEP, WPA, TKIP, AES to secure Wi-Fi communication, etc. | 10 |
| **List of Experiments** | 1. Visit the Websites (IBM.com, hp.com, dell.com etc.) and get the configurations of various models of portable computer, laptops and notebooks.<br>2. A customer has lost the driver CD of an IBM ThinkPad series Laptop. Download all the drivers and Burn a CD for this system.<br>3. An old Laptop doesn't support a hard disk size >10 GB. Download a latest version of the BIOS and carefully upgrade the BIOS of the given System.<br>4. A Laptop hard disk has to be connected to a PC IDE port. Suggest a suitable converter.<br>5. Connect a PC IDE disk to a Laptop system on a USB port.<br>6. Using Infrared port, transfer files between two Laptops.<br>7. A customer wants to communicate between some model of a Nokia mobile phone, and a Laptop. Download a suitable driver, and communicate using infrared ports on two systems.<br>8. Install a PCMCIA WLAN card on a laptop & establish a connection with wireless access point in the vicinity.<br>9. Connect two Laptops in peer configuration using Radio based wireless LAN card.<br>10. Install PCMCIA Ethernet card on an old laptop, which | 25 |

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| | doesn't have an inbuilt Ethernet card.<br>11. configure wireless router/ Access point for establishing secured wireless network.<br>12. remotely access the wireless router for its configuration and disable the configuration through wireless access. | |