

35261 – COMPUTER HARDWARE AND SERVICING DETAILED SYLLABUS

UNIT – I MOTHERBOARD COMPONENTS

1.1 Motherboard components: Processor sockets/slots – Memory sockets – Chipsets – Cache– BIOS – Clock generator – RTC – Super I/O Controller – Power connector – Battery –Keyboard/Mouse Connectors – Jumpers – Ports and Headers – Pin Connectors Motherboard Form factor - Hardware, Software and Firmware.

1.2 Mother Board: Architecture and block diagram

1.3 Processors: Introduction –Core2 Duo processor, Quad core processor, Core i3, i5, i7 series, AMD A10 series, Xeon Processor.

1.4 Chipsets: Chipset basics - North / South Bridge architecture and Hub architecture.

1.5 Bus Standards: Overview and features of PCI, AGP, USB, & Processor Bus.

UNIT – II MEMORY AND I/O DEVICES

2.1 Primary and Secondary Memory: Introduction - Memory speed – Access time – Wait states. Main Memory – types - Memory errors. Hard Disk: Introduction – Construction – Working Principle – File Systems – Formatting and Troubleshooting.

2.2 Removable Storage and Special Devices: DVD-ROM – Recordable DVD – Rewritable DVD. Blu-ray: Introduction - Blu-ray Disc Parameters – Recording and Playback Principles. Special drives: External drives, Memory stick, USB flash drive, Solid state drive.

2.3 Keyboard and Mouse: Keyboard: Interfacing and Signals (USB, Wireless), Types of keys, Keyboard Matrix, Key bouncing, Types of keyboard (Simple, Mechanical). Mouse: Optical mouse operation – Optical mouse cleaning – Troubleshooting flowchart for a mouse.

2.4 Printers and Scanners: Printer: Introduction – Types of printers – Dot Matrix, Inkjet, Laser, Thermal, MFP printer (Multi Function Printer) - Operation and Troubleshooting. Scanner: Introduction, Scanner mechanism, working principle – Types of Scanners (Barcode, Handheld, Flatbed) – Preventive maintenance and Troubleshooting.

UNIT– III DISPLAY, POWER SUPPLY and BIOS

3.1 Displays and Graphic Cards: Displays: LCD Principles – Plasma Displays – TFT Displays - LED Displays. Graphic Cards: Video capture card.

3.2 SMPS: Block diagram – Basic Principles and Operations – O/P Voltage – Cable color code – Connectors and Power Good – Common Failures (No circuit diagram to be discussed)

3.3 Bios: Bios functions – Cold and Warm booting – BIOS error codes – BIOS interrupts – BIOS advanced setup. Upgrading BIOS, Flash BIOS-setup. Identification of different BIOS (AMI, AWARD BIOS).

3.4 POST: Error, Beep Codes, Error messages, Post – Faults related to Hardware.

UNIT – IV MAINTENANCE AND TROUBLESHOOTING OF DESKTOP & LAPTOP COMPUTERS

4.1 Laptop: Difference between laptop and desktop- Types of laptop – Block diagram –working principles–configuring laptops and power settings – SMD components, ESD and precautions

4.2 Laptop components: Adapter – Types, Battery –Types and basic problems, RAM– types, CPU – types, Laptop Mother Board - block diagram, Laptop Keyboard.

4.3 Installation and Troubleshooting: Formatting, Partitioning and Installation of OS –Trouble Shooting Laptop and Desktop computer problems.

4.4 Preventive Maintenance and Upgrading: Preventive Maintenance: Tools required –active and passive maintenance – Types of Diagnostics software – Preventive Maintenance Schedule. Upgrading of Systems: Motherboard, Memory, CPU, Graphics Card, BIOS up gradation and Updating of System & Application software.

UNIT – V MOBILE PHONE SERVICING

5.1 Mobile phone components: Basics of mobile communication, Components: battery- antenna-ear piece- microphone -speaker-buzzer-LCD- keyboard. Basic circuit board components – Names and functions of different ICs used in mobile phones.

5.2 Tools & Instruments used in mobile servicing: Mobile servicing kit -- soldering and de-soldering components using different soldering tools - Use of multi-meter and battery booster.

5.3 Installation & Troubleshooting: Assembling and disassembling of different types of mobile phones – Installation of OS - Fault finding & troubleshooting- Jumper techniques and solutions.

5.4 Software: Flashing- Formatting- Unlocking -Use of secret codes- Downloading- Routing.

5.5 Diagnostic Software and Viruses: Mobile Viruses – Precautions – Antivirus Software.

REFERENCES

- 1 Computer Installation and Servicing D.Balasubramanian TataMc-Graw Hill, New Delhi Second Edition 2010
- 2 PC Repair and Maintenance Joel Rosenthal Fire wall Media, New Delhi First Edition 2007 Reprint : 2012
- 3 Modern Computer Hardware Manahar Lotai, BPB Second Revised