ELECTRONICS TECHNOLOGY

CLASS–XII
ELECTIVE
OPERATION AND MAINTENANCE OF COMMUNICATION DEVICES (789)

THEORY

Time: 2.5 Hours ***Marks: 50***

1. Introduction to Communication System — 15

- Information signals, Elements of communication system, Transmitters and Receivers, Bandwidth of signals, Propagation of electromagnetic waves in the atmosphere, Sky and space wave propagation.
- Noise, Classification of noise, Source and description of noise.
- Fundamentals of Analog and Digital communication, Digital data transmission.
- Need of modulation, Modulation/ Demodulation of Amplitude-modulated wave, Phase- modulated and Frequency modulated wave, Pulse modulation.
- Introduction to Wireless communication, Basics of mobile communications, A simple reference model, Mobile and Wireless devices.
- Frequencies for Radio Transmission, Regulations act.
- Basics of cellular system, Elements of cellular radio systems, Performance criteria.

2. Satellite Communications — 5

- Introduction and brief history of satellite communication, Overview of Satellite system.
- Satellite frequency bands, Introduction to Telemetry, Tracking and Command, Satellite mobile communication, Introduction to C/N ratio and S/N ratio, Introduction to VSAT technology.
- *Special Information - (Introduction to Radio propagation and Antenna).

3. Mobile Technology — 10

- History of Mobile technology, Generation of mobile phones.
- Basics of TDMA, FDMA, CDMA and GSM, Mobile Services.
- (* Special Information - GSM and CDMA Architecture).
- Overview of Mobile phone components, Bluetooth, Infrared, GPRS, Wi-Fi, SIM, IMEI.
- (* Special Information - DECT, UMTS, IMT-2000).
- Base and Master system

4. Mobile Hardware and Software — 10

- Introduction to Mobile hardware and their faults, Basic circuit board configuration, Identification and Working of different BGA IC’s, Working on SMD and PCB’s.
- Introduction to software and their faults, Formatting of virus affected mobiles, Removing software problems by codes, Unlocking of mobile phones using codes and software, Unlocking codes for GSM & CDMA.

5. Support Program — 10

- How to open and manage your own mobile repair shop.
- How to successfully work as a technician.

- Where to procure tools, spare parts and accessories.
- How to deal with customers and distributers.
- Technical support guidance.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

1. Assembling & disassembling of different types of mobile phones.
2. Use of various tools & instruments used in mobile phone repairing.
3. Study of basic parts of mobile phones (mic, speaker, vibrator, LCD, antenna, etc) And Testing of various parts with multi-meter.
4. Recognize different IC's and study their working.
5. Soldering and De-soldering of different BGA IC's using soldering iron.
6. Practice of changing Driver IC Jumper.
7. Practice of changing Display in mobiles.
8. Practice of changing various jacks in mobile phones.
9. Practice of changing Bluetooth module.
10. Cool testing and hot testing of mobile phones for fault finding.
11. GSM
12. CDMA

PRACTICAL GUIDELINES

Parameters	Marks
Project / Practical Activities.	10
Viva Based on Project.	10
Practical File / Report or Portfolio.	10
Demonstration of skill Competency in Lab Activities.	20
Total	**50**

CLASS–XII
ELECTIVE
TROUBLE SHOOTING & MAINTENANCE OF ELECTRONIC EQUIPMENTS (790)

THEORY

Time: 2.5 Hours ***Marks: 50***

1. Basic Occupational Safety and Precautions — 15

2. Microphones and Loudspeakers — 5

- Construction, working principle and frequency response of Carbon Microphone, Variable Reactance Microphone, Capacitance Microphone, Piezo-Electric Microphone, Moving Coil Microphone.
- Frequency ranges of musical instruments, Intensity and Dynamic Range, Constructions and working principles of Moving Coil Loudspeaker, Impedance and Power Level of loudspeaker, Frequency characteristics of Practical Loudspeakers: Woofer, Tweeter, Squawker, and Loudspeaker Enclosure.

3. Recorders — 10

- Analog and digital sound recording, Disk recording and reproduction, working principle with block diagram of disk recording and reproduction.
- Principle of magnetic recording and playback, Requirement of bias, Working principle with block diagram of a tape recorder system.
- Principle of optical recording, CD/ DVD manufacturing and recording, CD/ DVD player system, Advantages/ Disadvantages.
- Steps for Fault finding & Analysis.

4. TV System — 10

- Working principle with block diagram of TV transmitter and receiver, Brief description with circuit diagram: TV Tuner, Video IF stage, Sound stage, Picture tube & its associated circuit, Synchronizing circuits, Horizontal & vertical deflection circuits, Remote control of a TV receiver, Idea of bandwidth, blanking and synchronization pulses, modulation scheme, monochrome system, extension of colour transmission.
- Channel and cable type TV system, Head end processor, Trunk & cable distribution system with block diagram, Scrambling.
- Introduction to LCD and LED TV systems, Introduction to high definition systems.
- Steps for Fault finding & Analysis.

5. Modern Appliances — 10

- Working principle and block diagram of following:

  Microwave oven, Telephone, Fax machine, Printers, Scanners.
- Steps for Fault finding & Analysis.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

1. Assembly study and fault finding of an audio amplifier.
2. Assembly, study and fault finding of a graphic equaliser.
3. Study working, assembly & fault finding of Colour TV.
4. Study working, assembly & fault finding of LCD TV.
5. To trace the fault in the following panel controls and correct them:
    - Volume control.
    - Brightness control.
    - Contrast control.
    - Vertical hold control.
6. To trace the following stages of T.V. set:
    - Tuner.
    - MF stage.
    - Video detector.
    - Video amplifier.
    - Sound I.T.
    - Sound output stage.
    - Syne separator.
    - Vertical oscillator.
    - Horizontal oscillator.
    - Line Driver Stage.
    - Line output transformer.
    - Power supply.
7. To find fault for the following defects:
    - No picture no sound.
    - Sound present, picture missing.
    - Picture rolls vertically.
    - Picture tears (Horizontal oscillator).
    - Faults in tuner/IF/power supply.
8. Study working, assembly & fault finding of tape recorder system.
9. Study working, assembly & fault finding of CD/DVD player system.
10. Study working, assembly & fault finding of Printer.
11. Study working, assembly & fault finding of Scanner.
12. Study working, assembly & fault finding of Microwave oven.
13. Study working, assembly & fault finding of Telephone.

14. Study working, assembly & fault finding of Fax Machine.
15. Study working, assembly & fault finding of UPS system.
16. Study working, assembly & fault finding of DTH kit.

PRACTICAL GUIDELINES

Parameters	Marks
Project / Practical Activities.	10
Viva Based on Project.	10
Practical File / Report or Portfolio.	10
Demonstration of skill Competency in Lab Activities.	20
Total	**50**

CLASS–XII
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

GUIDELINES FOR EXAMINERS

1. Examiner should check-up at least one result of the examinee.
2. As far as possible each examinee should be given separate experiment.
3. Main emphasis should be given on the evaluation of work done, professional competency, workmanship and finish etc.
4. The object of Viva-voce should be to ascertain the depth of know ledge and understanding of the student. Questions as ked should pertain to experiment per formed by the student as well as the experiments.
5. Eachstudentmaybeallottedtwoexperimentsfromthelistandhe/shemayperformanyone out of the two.

GENERAL INSTRUCTIONS TO THE STUDENTS/CANDIDATES

Note: Be for starting the practical, student should submit the connection diagram along with the list to equipment to the examiner.

1. Each student should check-up the material/tool sand equipments as per the requirement of the examination.
2. Each student should make himself/herself clear in understanding the question paper fully before its commencement.
3. Any student who finds any problem n handling the machine/equipment should immediately contact his/her Invigilator/Examiner.
4. Each student must do all the required operations himself/herself without the help of other students.
5. Each student should bear in mind the time allotted to him/her so that he/she may finish his/her jobs within the stipulated time.