

**MODIFIED/ RESTRUCTURED SYLLABUS FOR DEPARTMENTAL EXAMINATION
(for promotion of HELPER to the grade of TECHNICIAN) [Revised - 2008]**

The revised examination pattern consist of

- i) **Written Test consisting of one paper of 3 hours duration carrying 200 marks. Out of which Part-I is compulsory for all the candidates and of 100 marks. Part-II consists of two parts i.e (Part II – A : Basic of Radio Broadcasting) and (Part II – B : Basic of TV Broadcasting). Candidate may choose either Part II – A or Part II – B. Each part is of 100 marks.**
- ii) **Practical Test of 3 hours duration carrying 100 marks**

i) Written Test- 200 marks

Part I : BASIC PRINCIPLES OF ELECTRICITY AND ELECTRONICS-(100 MARKS)

1. Concepts of voltage, Current, Power Energy and their units. Ohms law and its applications.
2. Identification & functioning of components like resistors, inductors, capacitors and their colour codes. Voltage and power ratings, series and parallel combination of components.
3. Different types of batteries, their charging, trickle charging, care and maintenance. Solar cells/panels.
4. DC supply, AC single phase and three phase supply,regulation, power factor.
5. Electrical symbols, standard wire gauge, fuses, switch-gears, earthing practices, domestic wiring, meters like standard voltmeters, Ammeters, multi-meters,meggers etc.
6. Functioning of AC and DC motors, starters for motors, Star/Delta connection. Speed regulation, rating of motors and basic maintenance.
7. Working of transformers, turns ratio, Primary/Secondary voltage, tapings on windings, transformer cooling, transformer oil testing and its filtering.
8. Identification and basics of active elements like various types of vacuum tubes, semi conductor devices and transistors. Circuit configurations of transistors and comparison with valve circuits. Basics of FET, SMPS and digital basics.
9. Different types of Amplifiers, Rectifiers, Oscillators their characteristics and application.

PART-II

Part II – A: BASIC OF RADIO BROADCASTING- (100 marks)

1. Broadcast chain from microphone to studio output including Announcer console pre-amplifier, Programme Amplifier, Switching Console, Equalising Line Amplifier etc. Maintenance of studio equipment
2. Knowledge of control of programmes in terms of level and quality, monitoring devices such as : VU meter, headphone, loudspeaker, Monitoring amplifier etc.

3. Basic of Audio Tape Recorders
4. Outside broadcast set up; tools, equipment and precautions.
5. Broadcast chain for AIR transmitter from input to antenna at transmitter site. Functions of important components and stages like limiter, AF stages, RF stages etc and other ancillary equipments.
6. FM transmitter and its associated equipments.
7. Various types of aerials and feeders used in AIR. Their characteristics and functions.
8. Studio transmitter link and receiving equipment, Radio Networking Terminal
9. Servicing procedures for Radio, tools and equipment used for servicing.
10. Concept of dB, dBm, VU; Frequency Response; Distortion and Noise Level.
11. Attenuators, pads, multiple pads, repeat coils, Equalizers and filters.
12. Different type of microphones and their applications.
13. Basics of Satellite communication
14. Petrol and diesel generators their working principles; functions of various components and maintenance.
15. Identification of components and functioning details in respect of air-conditioning plants including windows air-conditioners; Charging of gas, leak detection and purging.
16. Safety precautions, fire fighting and first aid practices as given in AIR Manual of Safety precautions.

Part II-B: BASIC OF TV BROADCASTING- (100 marks)

1. Basic of Video Tape Recorders
2. Outside broadcast set up; tools, equipment and precautions
3. Various types of aerials and feeders used in Doordarshan. Their characteristics and functions.
4. Studio transmitter link and receiving equipment, TVRO and DRS
5. Working knowledge of studio chain in TV studio from camera to studio output.
6. Basic principles of lighting in TV studio. Care and handling of lighting equipment.
7. Facilities in TV OB Van, laying cables for audio/ video, power supply and microwave links. Handling and care of ENG and EFP equipment and other studio equipment.
8. Broadcast chain for TV transmitter from input to antenna. Functions of important units of Low Power Transmitters (LPTs / VLPTs), Medium Power and High Power Transmitters, (VHF/UHF)
9. Servicing procedures for TV receiver, tools and equipments used for servicing.
8. Concept of dB, dBm, VU; frequency Response; Distortion and Noise Level.
9. Attenuators, pads, multiple pads, repeat coils Equalizers and filters.
10. Different type of microphones and their applications.

11. Basics of Satellite communication
12. Petrol and diesel generators their working principles; functions of various components and maintenance.
13. Identification of components and functioning details in respect of air-conditioning plants including windows air-conditioners; Charging of gas, leak detection and purging.
14. Safety precautions, fire fighting and first aid practices as given in AIR Manual of Safety precautions

Practical Test of 100 marks

Testing of skills in the following Practicals:-

1. Soldering
2. Care & use of various mechanical and electrical tools used in our networks.
3. Operation, maintenance and routine measurements on air conditioning plants.
4. Operation and maintenance of Diesel Generators.
5. Electrical wiring, replacement of switches, fuses and other components.
6. Use of various meters like multimeter, sling Psychrometer, Tachometer, hydrometer, Anemometer, Halide leak detector and various pressure gauges.
7. Use of Test instruments such as insulation tester, Transistor tester and IC tester & Oscilloscope.
8. Dismantling and assembling of electrical/electronic equipment.
9. Maintenance of lead storage batteries.
10. Use of fire fighting equipment and safety gadgets.
11. Ability to read technical pamphlets.
