

INDIRA TECHNICAL INSTITUTE EDUCATION SOCIETY NASHIK

CERTIFICATE COURSE ELECTRICIAN [E]

EXAM SCHEME: THEORY PAPER 100 MARKS – 3 HRS.
PRACTICAL 100 MARKS – 2 HRS.

[E / DEES – (EL) – I / ADEES – (EL) – I]

THEORY SYLLABUS

1. BASIC ELECTRICITY

- ❖ Study of voltage, current, Resistance their units.
- ❖ Close circuit, open circuit, short circuit
- ❖ Ohm's Law
- ❖ Series, Parallel and combine circuit.
- ❖ Power, power factor, Electrical Energy Bill calculation.
- ❖ Types of supply A.C. (1ph, 3ph, 3ph and N), D. C. Supply.

2. ELECTRICAL APPLIANCES

- ❖ Study about various appliances use in house hold purpose, their construction, working, faults and reasons, testing, precaution when using them.
- ❖ 1. Electric Iron (ordinary and automatic) 2. Toster 3. Soldering Iron 4. Storage type Heater 5. Immersion type water heater 6. Table fan 7. Mixer 8. Food processor 9. Washing machine 10. Exhaust fan 11. Ceiling fan 12. OVEN.

3. CELL'S AND BATTERIES

- ❖ To study of electrolysis, electro light and electroplating.
- ❖ Study of primary cells and secondary cell, and their difference, study of following primary cell.
- ❖ Primary cells – Voltaic cell, Donial cell, Dry cell.
- ❖ How to find out Internal resistance of cell.
- ❖ Secondary cell – study about lead acid batteries, their construction, chemical reaction when charging and discharging time, precautions while using batteries.
- ❖ Faults produce in batteries.
- ❖ Capacity of battery
- ❖ Charging methods of battery, constant current and constant voltage method.
- ❖ Indications of charge battery.
- ❖ Know about Hydro meter and High rate cell discharge cell Tester.

4. MAGNET AND MAGNETISM

- ❖ Definition of magnet, their properties
- ❖ Types of magnet (Natural and artificial)
- ❖ Weber's molecular theory
- ❖ Methods of prepare magnet in Lab
- ❖ Study of electromagnet.
- ❖ To study of definition relating to magnet
Like → Magnetic pole, mag.Lines, mag.field, polar Axis Unit Pole, Mag.Induction etc.
- ❖ Some definition relating to electro magnet.
Lime → M.M.F., Reluctance, Ampere turn etc.
- ❖ Study about various laws relating to magnet and electromagnet.
- ❖ Right hand rule, cork screw rule, Fleming's right and left hand rule, Lenz's law, Faraday's law of electromagnetic induction, end rule
- ❖ Self induction
- ❖ Mutual induction.

5. D. C. GENERATOR

- ❖ Definition of generator
- ❖ Working Principal of Generator
- ❖ Difference between A.C. and D.C. Generator
- ❖ Study about parts of D.C. Generator
Like → Yoke, pole core pole shoe, field winding Armature, Brush, Front and end plate, Bearings.
- ❖ Types of D.C. Generator based on connection between armature and field winding
1) Series Gen. 2) Shunt Gen. 3) Compound Gen.
- ❖ Study of E.M.F. formula of D.C. Generator.
- ❖ Losses (Mechanical and Electrical), and faults produce in D.C. Generator.
- ❖ Armature reaction
- ❖ Interpol

6. TRANSFORMER

- ❖ Introduction of Transformer
- ❖ Working Principle of Transformer
- ❖ Main parts of Transformer
- ❖ Various Types of Transformer
1) Core type Tx. 2) Shell type Tx. 3) Berry type Tx. 4) Step up Tx. 5) Step Down Tx.
6) Current Tx. 7) Potential Tx. 8) Distribution Tx. 9) Auto Tx.
- ❖ Study about Transformer ration.
- ❖ Study about cooling methods of Transformer

7. A. C. MOTOR (1ph & 3ph), STARTER'S

- ❖ Definition of motor
- ❖ Difference between AC and D.C. Motor
- ❖ Working principle of 3ph and 1ph motor's
- ❖ To study various parts of AC motor, like – yoke, stator, Rotor, winding, centrifugal switch, bearings, front and end plate, name.
- ❖ Study about various single phase Motor's split phase motor, capacitor motor (C.S.C.R., Cap. start Induction motor, permanent capacitor motor)
- ❖ Shaded pole motor
- ❖ Universal motor.
- ❖ Study about various Three phase motors
- ❖ 3 ph squirrel cage Induction motor.
- ❖ Slip ring Induction motor.
- ❖ Synchronous motor.
- ❖ Faults and their reasons produce in AC motor's
- ❖ Motor's and their applications.
- ❖ Starter required for 3 phase motors DOL Starter, Semi and Automatic star Delta Starter, Reverse – forward switch.

8. ILLUMINATION

- ❖ To Study generation of light and study in brief radiant energy.
- ❖ To study various definition relating to illumination
- ❖ Study of different methods of illumination, direct method, indirect method, semi direct and semi indirect method.
- ❖ Study of different types of lamps.
Incandescent lamp, Arc lamp, Gas Discharge Lamp (Mercury Vapour lamp, sodium vapour lamp, Neon Lamp etc.)

9. CONDENSER (CAPACITOR)

- ❖ Study about the definition of condenser, and study of construction of capacitor.
- ❖ Various definition related to capacitor for ex. Capacitance, capacitive reactance.
- ❖ Study of series and parallel connection of capacitor
- ❖ Study of various types of capacitors, their use in electrical field
- ❖ Testing of capacitor

10. MEASURING INSTRUMENTS

- ❖ Study of various types of meters
- ❖ 1) Indicating meter's 2) Integrating meters 3) Recording meter's.
- ❖ Parts of meters
- ❖ Precautions to be taken while using meters.
- ❖ Connections of various meters.

11. GENERATION, TRANSMISSION, DISTRIBUTION

- ❖ Study about different types of Generation system of electricity.
- ❖ Study of sources from which electricity is produced
- ❖ Primary source – solar energy
- ❖ Secondary source – Thermal power station, Hydro electric power station, Diesel power station.
- ❖ Study of Insulating material use in over head wiring.
- ❖ Poles use in over head wiring
- ❖ Know about over head wiring Earthing pit.
- ❖ Study about under ground caballing
- ❖ Cable's used in under ground wiring.
- ❖ Study about distribution of electricity (L.V.)

SCHEME OF EXAMINATION

THEORY	100 MARKS
PRACTICAL	75 MARKS
JOURNAL	15 MARKS
ORAL	10 MARKS

GUIDELINE FOR PAPER SETTER

Inst. :- Q. No. 1 is compulsory, Solve any Five Q. questions from Q. 2 to Q. 7.	100 Marks
Q. 1 Compulsory and Objective type (Fill in the blanks, True or False, Match the pair, Answer in one or two sentence etc.)	20
Q. 2 Topic 1, 2 ❖ 50% Each Topic.	16
Q. 3 Topic 3, 4 ❖ 50% Each Topic.	16
Q. 4 Topic 4, 5 ❖ 50% Each Topic.	16
Q. 5 Topic 5, 6	16
Q. 6 Topic 7, 8, 9 ❖ Topic 7 = 40%, Topic 8 = 30%, Topic 9 = 30%.	16
Q. 7 Topic 10, 11 ❖ 50% Each Topic. ❖ Write any five Question from Question No. 2 To Question No. 7.	16

REFERENCE BOOKS

- ❖ Basic Electrical Engineering → by M. L. Anwani
- ❖ Sulabh Vidyutshastra → by Trambak Waghmare
- ❖ Wireman (MARATHI / ENGLISH → by Prakash Shah
- ❖ Vidyutshastra → Shyam pitke.t

