

**INDIRA TECHNICAL INSTITUTE EDUCATION SOCIETY
NASHIK**

**DIPLOMA ELECTRICAL ENGINEERING SERVICES
(DEES(EL))**

Theory Paper I	: Syllabus for this paper is same as Certificate Course in ELECTRICIAN [E] Refer this syllabus booklet Page No. _____	100 Marks
Theory Paper II	: Syllabus for this paper is same as Certificate course in ARMATURE & MOTOR REWINDING [AM] Refer this syllabus booklet Page No. _____	100 Marks
Theory Paper III	: Theory syllabus for this Diploma Paper III is Printed below.	100 Marks
Practical I and II	: Two separate Practicals Practical – I same as E Practical – II same as AM	100 Marks 100 Marks
Total :		(500 marks)



(DEES – (EL) PAPER – III)

THEORY SYLLABUS

1. I.S.I. SYMBOL'S, I. E. RULES

- ❖ Know about meaning of I.S.I., I.S., I.E., I.S.O. etc.
- ❖ Study of different symbol's use in Electrical Drawing (More than wireman levea) (150 To 175 symbols)
- ❖ Study of different I. E. Rule related to electric supply company, H.V., L.V. consumer's House wiring, Industrial Installation, cinema Hall's etc.

2. POWER GENERATION SYSTEMS, TRANSMISSION DISTRIBUTION

- ❖ Study about various types of power station's their Drawing's, block diagram, capacity of various power station's
- ❖ Their advantages and disadvantages
- ❖ Thermal power station's.
- ❖ Hydro Electric power station's,
- ❖ Atomic power station's.
- ❖ Gas turbine power station's.
- ❖ DIESEL Power station's
- ❖ Windmill plant
- ❖ Solar energy plant.
- ❖ Study about Transmission systems
- ❖ Why Transmission is high, study about Transmission voltages
- ❖ Like 11kv, 22kv, 33kv, 66kv, 132kv etc.
- ❖ Study different poles and lowers use in Transmission line's their Drawing

- ❖ Study about O.H. and under ground wiring
- ❖ Types of gording use for OH lines.
- ❖ Various definition related to above like main feeder, Transmission feeder, Distribution lines, service mains etc.
- ❖ Layout Drawing of Transmission, Distribution
- ❖ Study about various Electrical Distribution system REDIAL DISTRIBUTION, RING DISTRIBUTION, Their Drawing Grid Distribution.
- ❖ Tree Distribution.

3. SUB STAION

- ❖ What is sub station ? Importance of substation in Transmission and Distribution system.
- ❖ Equipment use in sub stations, their names and use is sub station
For ex – Transformer, C. B., Isolator, Fuse, Lightning Arrestor, metering panel etc.
- ❖ Work of Sub Station.
- ❖ Types of substations like –
 1. Transformer substation a) step up Sub Station's b) Step Down Sub Station's
 2. Secondary sub Station's
 3. Distribution sub Station's
 4. Switching sub Station's
 5. Power factor correction sub Station's
 6. Converting sub. Station's
 7. Industrial sub station
 8. Indoor sub station's
 9. Out Door sub station's
 10. Pole minted sub station's(2 pole, 4 pole structure)
 11. Plinth mounted sub station's
 12. Under Ground sub station's
- ❖ Various Drawing's of sub stations
- ❖ Single line Diagram of 11 kv Indoor sub station's.

4. SUB STATION EARTHING, LIGHTNING ARRESTOR

- ❖ Why earthing need in sub stations.
 - ❖ Methods of prepare earthing
 - ❖ Testing of earthing
 - ❖ Study about need of Double earthing for Industrial or Substation equipments
 - ❖ Know about lightning Arrestor, working of this
 - ❖ And types of lightning arrestor of ex.
 - ❖ Horn gap lightning arrestor
 - ❖ Oxide film arrestor
 - ❖ Auto valve arrestor
 - ❖ Thyrite Arrestor
 - ❖ Electrolytic Arrestor.
- Use of Ground conductor for H. T. Lines.

5. H. T. Transformer

- ❖ Working of Transformer.
- ❖ Study about H. T. Transformer's
Power TX and Distribution TX.
- ❖ C.T. & P.T.
- ❖ Difference between then
- ❖ Parts of above TX.
- ❖ Efficiency of TX.
- ❖ Various testing of TX.
- ❖ Parallel connections of two TX.
- ❖ Maintenance of TX. – Daily, weekly, Monthly, ½ yearly, yearly, after five years.
- ❖ Oil Testing.

6. A) BUSBAR B) CAPACITOR INSTALATION

A) BUSBAR

- ❖ Study about Bus bar
- ❖ Metals use of bus bar's
- ❖ Bus bar Reating
- ❖ Method's of Bus bar connection's use in various place's
- ❖ Single Bus bar method
- ❖ Duplicate bus bar method
- ❖ Sectional bus bar method.
- ❖ Know about Lug's and Crimping Tool's.

B) Use of capacitor in industrial installation. Study about power factor, losses of low P. F. How improve low P. F. with the help of capacitor bank.

- ❖ Testing of capacitor.

7. A) ISOLATER AND CIRCUIT BREAKER'S, INDUSTRIAL WIRING

A) Know difference between switch, Isolator and circuit breaker's

- ❖ Drawing of Isolator
- ❖ Study about different types of C.B. their use, capacity, Connections etc. Study about M.C.B., ELCB, Minimum oil C.B., Vacuum C.B., SF₆ CB, Air blast C.B. etc.

B)

- ❖ Study about Industrial wiring, sample layout Drawing of Industrial wiring.
- ❖ Materials use for above wiring like – Cables, S. F. unit's, clamps, I.C.D.P., I.C.T.P. switches, Distribution Boxes.
- ❖ Precaution's while Install Industrial wiring.

8. A) LIFT INSTALLATION B) PANEL BOARD WIRING

A)

- ❖ Why lift's are mostly use in recent days.
- ❖ Construction of lift
- ❖ Parts of Lift's installation like lift well, Guide Rail, Counter weight, Lift car, car Buffers, counter weight buffers, Gear's, Motor, rope Indicators, safety gears,
- ❖ Know about machine room
- ❖ Safety equipment use in Life installation. Slack rope switch, Terminal slow down switch, Terminal stopping switch, over speed governor.
- ❖ Various types of Lifts.
Passenger Lift, Goods Lift, Service Lift, Faire Lift, Hospital Lift etc.
- ❖ Rules related to Lift Installation.

B) Know about panel Board, which types of work include for make panel Board, Like-Layout of panel Board.

- ❖ Connection Drawing of panel Board
- ❖ Fabrication work
- ❖ Electrical fitting work etc.
- ❖ Two – three Drawing of panel Board.
Front view, connection Drawing
- ❖ Precaution to be taken when making panel Board.

9. A) SUPPLY POINTS B) WATER PUMP INSTALLATION C) FIRE RIGHTING INSTALLATION D) FARM HOUSE WIRING

A) Supply Points.

- ❖ Know about meter room wiring for chawl types rooms, 2 – 3 Floor's Building's, Towers etc. Industrial supply.
- ❖ Know about which documents are necessary for new meter connection.

- B) Water Pump Installation
 - ❖ Know about water pumps Installation's, precautions, while Installing pump.
- C) Know about fire fighting Installation.
- D) Know about farm house wiring, Precaution when done this work.

10. A) STAND BY POWER SUPPLY B) WASHING MACHINE

- A) Stand by Power Supply
 - ❖ Need of stand by Power supply.
 - ❖ Sources of stand by power supply.
 - ❖ Diesel Generator set.
 - ❖ Inverter, wiring methods of Inverter's
 - ❖ U.P.S.
 - ❖ Wash
- B) Washing Machine
 - ❖ Construction of machine, Parts of Machine, faults produce in Washing Machine Testing.

GUIDELINE FOR PAPER SETTER

SUB – DEES(EL) PAPER III 100 Marks

Inst. :- Q. No. 1 is compulsory, Solve any Five Questions from Q. 2 to Q. 7.

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|---|----|
| Q. 1 Compulsory and Objective type
(Fill in the blanks, True or False, Match the pair, Answer in one sentence etc.) | 20 |
| Q. 2 Topic 1 & 2 50% Each Topic.
❖ Minimum 2 Sub Question and maximum 3 Sub Question if required OR Question is given in Sub Question. | 16 |
| Q. 3 Topic 3
❖ Same Instruction as above | 16 |
| Q. 4 Topic 4, 5
❖ 50% Each Topic. | 16 |
| Q. 5 Topic 5, 6
❖ 50% Each Topic. | 16 |
| Q. 6 Topic 7, 8
❖ 50% Each Topic. | 16 |
| Q. 7 Topic 9, 10
❖ 50% Each Topic. | 16 |

❖ Write any five Question from Question No. 2 To Question No. 7.

