

HALL TICKET NUMBER

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PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE
(AUTONOMOUS)

IV B.TECH I SEMESTER END REGULAR EXAMINATIONS, NOV-2022

UTILIZATION OF ELECTRICAL ENERGY

(EEE Branch)

Time: 3 hours

Max. Marks: 60

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-AAnswer **all** the questions in Part-A (5X2=10M)

- 1 a) What are the different types of loads based on time and duty? [2M]
- b) What are the properties of heating element? [2M]
- c) State the requirements of good lighting. [2M]
- d) What are the advantages and disadvantages of electric traction? [2M]
- e) What are the factors affecting specific energy consumption of locomotive? [2M]

PART-BAnswer **One Question from each UNIT (5X10=50M)**

UNIT-I

2. a) Classify and explain the electric drives. [5M]
- b) A 15 HP 230 V motor has an armature resistance including brushes of 0.72 ohm and when operating at rated load, the armature current is 58 A. Calculate the value of plugging resistor R if the armature current is limited to 1.6 times the full load value at the instant of the motor is plugged, Consider the back emf is 0.9 times the supply voltage at that instant. [5M]

OR

3. a) Explain the different processes and motors used for (i) Textile mills, (ii) Cement mills and (iii) Ship propulsion. [5M]
- b) Explain the need of load equalization. [5M]

UNIT-II

4. With a neat sketch explain the working principle of core type and coreless type induction furnace. [10M]

OR

5. a) Describe various methods of electric resistance welding. [5M]
- b) Explain the nature of electric supply is suitable for electric arc welding? [5M]

UNIT-III

6. a) State and explain laws of illumination. [5M]
- b) Define (i) waste light factor (ii) depreciation factor (iii) coefficient of utilization. [5M]

OR

7. a) Describe the construction and working principle of sodium vapour lamp [5M]
- b) Explain the different types of lighting schemes. [5M]

UNIT-IV

8. a) Explain the existing traction system in India. [5M]

- b) Explain the special features of traction motor [5M]

OR

9. a) Explain the main features of various train services and What type of train services corresponds to trapezoidal and quadrilateral speed time curves? [5M]
- b) A train has a schedule speed of 60 kmph between two stops which are 4.8 km apart. Determine the crest speed over the run if duration of stops is 55 sec and acceleration and retardation are both equal to 2.4 kmphs. Assume trapezoidal speed time curve. [5M]

UNIT-V

10. a) Explain dead weight, accelerating weight and train resistance referred to traction. [5M]
- b) Prove that if the speed-time curves are similar, Specific Energy Consumption is equal. [5M]

OR

11. a) Explain the suitability of (i) DC Series Motor and (ii) Poly phase induction motor for traction . [5M]
- b) Describe the principles of energy efficient motors. [5M]
