PVP 14

Code: EE5T3

III B.Tech - I Semester – Regular/Supplementary Examinations
October 2018

UTILIZATION OF ELECTRICAL ENERGY
(ELECTRICAL & ELECTRONICS ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks
11 x 2 = 22 M

1. a) Write electrical factors affecting the selection of motor.
   b) Explain the terms heating time constant and cooling time constant.
   c) Explain the advantages of induction heating?
   d) Define the terms Squeeze time, Weld time and Hold time.
   e) Explain candle power and mean horizontal candle power.
   f) Why sodium vapour lamps are preferred for street lighting?
   g) Why steam engine drive is not suitable for urban and suburban services where distance between stations is small.
   h) What are the merits and demerits of D.C system of track electrification?
   i) What are the factors affecting the schedule speed of a train?
   j) Define specific energy consumption.
   k) What are the advantages of electric braking?

PART – B

Answer any *THREE* questions. All questions carry equal marks. 3 x 16 = 48 M

2. a) Discuss the terms ‘continuous’, ‘intermittent’ and ‘variable’ loads with examples. 9 M

b) A 220V, 1000RPM, 100A separately excited DC Motor has an Armature Resistance of 0.1Ω. The motor is driving a constant torque load equal to rated Torque. Calculate the motor speed if the voltage drops to 200V. 7 M

3. a) Compare Direct core type Induction furnace and Indirect core type Induction furnace. 6 M

b) Explain the concept of choice of frequency for electric heating purposes. 5 M

c) Mention few differences between Seam Welding and Butt Welding. 5 M

4. a) A lamp fitted with 120 degrees angled cone reflector illuminates circular area of 200 meters in diameter. The illumination of the disc increases uniformly from 0.5- meter-candle at the edge to 2- meter-candle at the centre. Determine 8 M

(i) the total light received.
(ii) Average illumination of the disc.
(iii) Average candlepower of the source.

b) Discuss about sodium vapour lamp with neat diagram. 8 M

5. a) A train has a scheduled speed of 40 km/hr between two stops, which are 4 km apart. Determine the crest speed over the run, if the duration of stops is 60 sec and acceleration and retardation both are 2 km/hr/sec each. Assume simplified trapezoidal speed-time curve. 8 M

b) What are the advantages and disadvantages of track electrification. 8 M

6. a) Describe the procedure for calculating the specific energy consumption of an electric train. 8 M

b) Derive an expression for the tractive effort developed by a train unit. 8 M