P1490

[5460]-167

T.E. (Electrical)
UEE - UTILIZATION OF ELECTRICAL ENERGY
(2012 Pattern) (Semester-II) (End Sem.)

Time : 2½ Hours]   *[Max. Marks : 70*

Instructions to the candidates:

1)   All questions are compulsory.

2)   Neat diagrams must be drawn wherever necessary.

3)   Figures to the right side indicate full marks.

4)   Assume suitable data, if necessary.

5)   Use of logarithmic tables slide rule, mollier charts electronic pocket calculator and steam tables is allowed.

Q1) a)   Write a short note on limit switches, contactor and timer.   **[6]**

   b)   Explain with neat diagram Ajax Watt Furnace.   **[6]**

   c)   A 4.5 kW, 200V and 1ph resistance oven employs nichrome wire as heating element. If the wire temperature is to be 1000°C and that of the charge 500°C. Estimate the diameter and length of the wire. The ρ of nichrome alloy is 42.5 $\mu\Omega$m. Assume k and e of the element is 1 & 0.9 respectively.   **[8]**

OR

Q2) a)   Compare Resistance and Arc welding.   **[6]**

   b)   Two lamps of each 300 CP are suspended at a height of 6m and 10m from the ground and are separated by a distance of 12m apart. Find the illumination just below the two lamps.   **[6]**

   c)   Draw electric circuit diagram used in Refrigerator and explain in brief.**[8]**

Q3) a)   Explain in detail transformer, interrupter and circuit breaker used in traction substation.   **[8]**

   b)   State the advantages Electric Traction system also compare AC and DC traction system.   **[8]**

OR

Q4) a)   Sketch a neat block diagram and explain various equipment used in electric locomotive.   **[8]**

   b)   Write a short note on Composite system of Track electrification.   **[8]**

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Q5) a) Define average speed and schedule speed. State the factors affecting schedule speed. **[8]**

b) Draw Speed-time curve for main line service and explain different time periods in brief. **[10]**

OR

Q6) a) What is coefficient of adhesion? State the factors affecting on it. **[8]**

b) An electric train has an average speed of 42km/hr on level track between stops 1400m apart. It is accelerated at 1.7 km/hr/sec and braked at 3.3km/hr/sec. Draw the speed time curve for the run and show all the timings. Estimate specific energy consumption of the train. Take tractive resistance as 50N/T and rotational inertia of 10%. **[10]**

Q7) a) State and explain desirable characteristics of traction motor. **[8]**

b) Explain Bridge transition and Series - Parallel transition for traction motor control with suitable diagram. **[8]**

OR

Q8) a) Explain regenerative braking applied for DC shunt Motor. **[8]**

b) Write a short note on train signaling system. **[8]**

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