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Question Paper Code: 57303

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

Seventh Semester

Electrical and Electronics Engineering

15UEE703- ELECTRIC ENERGY UTILIZATION

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The voltage used for suburban train in D.C system is usually CO1- R
(a) 12V (b) 24V (c) 220 V (d) 600V to 750V
2. The basic elements of a electric drive are CO1- R
(a) Electric motor (b) Control system (c) a & b (d) None
3. Candela is the unit of CO2- R
(a) Luminous flux (b) Luminous Intensity (c) Wavelength (d) Speed
4. The unit of solid angle is CO2- R
(a) Degree (b) Radian (c) Steradian (d) Candela
5. Which of the following heating elements can give the highest CO3- R
temperature in resistance heating?
(a) Copper (b) Nickel Copper (c) Nichrome (d) Silicon's carbide
6. The welding electric circuit is CO3- R
(a) Always earthed (b) Never earthed (c) Through cables only (d) None of the above
7. Which among the following is not a type of Tariff? CO4- R
(a) Flat rate Tariff (b) Simple Tariff (c) Blockrate Tariff (d) Power Factor Tariff
8. Which of the following is the exact method of calculating depreciation CO4- R
(a) Straight line method (b) Diminishing value method
(c) Sinking fund method (d) None of the above

9. Which of the following is NOT the type of Hybrid Vehicle? CO5- R
 (a) Plug-in Hybrid (b) Parallel Hybrid
 (c) Natural Gas For Vehicles (d) Series Hybrid
10. Satellite power requirement is provided through CO5- R
 (a) Solar cells (b) Dry cells (c) Nickel-cadmium cells (d) Lead-acid batteries

PART – B (5 x 2= 10 Marks)

11. Classify the systems for electric traction CO1- U
12. What is stroboscopic effect of fluorescent tubes? How to eliminate it? CO2- U
13. Enumerate the advantages of electric heating. CO3- U
14. What is meant by economics of power generation? CO4- R
15. List out the advantages of electric vehicle over conventional vehicles. CO5- U

PART – C (5 x 16= 80Marks)

16. (a) Explain the factors governing the selection of motors. CO1-U (16)
 Or
 (b) A suburban electric train has maximum speed of 65 km/hr. The scheduled speed with station stop of 30 sec is 43.5 km/hr. If acceleration is 1.3 km/hr/sec, find the value of retardation. The average distance between stops is 3 km. CO1-APP (16)
17. (a) What are factors affecting the design of Lighting Scheme and Explain it with the justification. CO2- U (8)
 Or
 (b) An incandescent lamp hangs from the ceiling of a room. The illumination below the lamp vertically downwards is 80 lux. When the illumination is measured at a distance of 2 m from the vertical from the ceiling, its value is 40 lux. Find the candle power of the lamp and its vertical distance from the floor CO2- App (16)
18. (a) An electric toaster consists of two resistance elements each of 85 ohms. Calculate the power drawn from 250 volts ac single phase supply, when the elements are connected in (i) Parallel (ii) Series. Also, comment your suggestion on which kind of connection consumes less power. CO3- App (16)

Or

(b) Explain the modern trends in welding technique. CO3- U (16)

19. (a) Explain the procedures to determine the depreciation CO4- U (16)

Or

(b) A generating station has a maximum demand of 50,000 kW. CO4- App (16)
Calculate the cost per unit generated from the following data :

Capital cost = Rs 95×10^6 ;

Annual load factor = 40%

Annual cost of fuel and oil = Rs 9×10^6 ;

Taxes, wages and salaries etc. = Rs 7.5×10^6

Interest and depreciation = 12%

20. (a) Compare the conventional fuel based vehicles with hybrid electric CO5- U (16)
vehicle.

Or

(b) Explain the different types of batteries and their working CO5- U (16)
principle with neat sketch.

