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Question Paper Code: 31374

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Seventh Semester

Electrical and Electronics Engineering

01UEE704 - ELECTRIC POWER UTILIZATION AND ENERGY CONSERVATION

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is an electrical drive? Why electric drive becoming very popular?
2. Define the term braking.
3. State Lambert's cosine law.
4. What system of lighting should be recommended for drawing hall?
5. What are the essential properties of resistance heating element?
6. List the different types of electric welding.
7. What is meant by solar collector? Mention its types?
8. Define solar constant.
9. Define power coefficient in wind energy conversions.
10. What are the main environmental aspects due to wind turbine?

PART - B (5 x 16 = 80 Marks)

11. (a) Illustrate the four quadrant operation of an electric drive.

(16)

Or

- (b) (i) A suburban train has a maximum speed of 70 kmph. The schedule speed including a station stop of 30 seconds is 45 kmph. If the acceleration is 1.5 kmphs, Find the value of retardation when the average distance between stops is 4 km. (10)
- (ii) Discuss the various factors affecting the scheduled speed. (6)
12. (a) (i) Discuss the various methods of lighting calculations. (8)
- (ii) Explain the principle of operation of fluorescent tube. (8)

Or

- (b) An illumination on the working plane of 75 lux is required in room 72m x 15 m in size. The lamps are required to be hung 4 m above the work bench. Assuming a suitable space-height ratio, utilization factor of 0.5, a lamp efficiency of 14 lumens per watt and a candle power depreciation of 20% estimate the number, rating and disposition of lamps. (16)
13. (a) Illustrate the principle of operation of different types of but welding. (16)

Or

- (b) With neat sketch, explain the process of resistance heating. (16)
14. (a) Explain with necessary diagram the construction principle of operation and applications of solar collector. (16)

Or

- (b) (i) Derive the equation for useful energy gain for flat plate solar collector. (8)
- (ii) Explain with neat sketch, solar radiation geometry. (8)
15. (a) (i) Explain how to control the power using aerodynamic. (8)
- (ii) Explain the basic principle of wind energy conversion system with neat sketch. (8)

Or

- (b) (i) Discuss the various types of wind turbine with neat sketch. (8)
- (ii) Explain how to select the site for the wind energy systems. (8)