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Question Paper Code : 71518

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Eighth Semester

Electrical and Electronics Engineering

EE 2451/ EE 81/ 10133 EE 801 — ELECTRIC ENERGY GENERATION,
UTILIZATION AND CONSERVATION

(Regulation 2008 / 2010)

(Common to PTEE 2451/ 10133 EE 801 – Electric Energy Generation, Utilization
and Conservation for B.E. (Part-Time) Seventh Semester – EEE
Regulation 2009 / 2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the objective of load control in wind energy systems? How load control is achieved in small stand alone wind turbine?
2. List the various control rods used in nuclear reactor?
3. Differentiate load curve and load duration curve.
4. Compare two part tariff with power factor tariff.
5. How does the operation of a fluorescent tube differ when it is used on ac and dc supply?
6. If the total lumens required are 7200 and coefficient of utilization is 0.3, Calculate lamp lumens required.
7. Mention the factors which limit the choice of frequency in induction and dielectric heating?
8. What is meant by arc welding, also list its types?
9. Define specific energy consumption and discuss the factors which effect the specific energy consumption.
10. What type of braking is employed on a tram car driven by two series motor?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe with neat sketch the construction and principle of operation used for Thermal power plant. (10)
(ii) Explain the working of pumped storage power plant. (6)

Or

- (b) (i) Explain the working of a co-generation power plant with neat layout. (8)
(ii) Discuss various bus bar systems for distribution network. (8)
12. (a) (i) A consumer requires 10 lakh units per year and his yearly load factor is 30%. The tariff in force is Rs.420 per kw per year + Rs.19 per unit. Estimate the saving in energy costs if the load factor is improved to 100%. (8)
(ii) List the points to be considered for selection of size and number of generating units. (8)

Or

- (b) (i) What is energy auditing. Explain with few examples how energy auditing can improve the performance of the power system. (10)
(ii) Explain briefly the various factors which affect the quality of power supply. (6)
13. (a) (i) State and prove laws of illumination. (6)
(ii) Design a street lighting of a road of 300 m long which is required to be illuminated by providing 40 W fluorescent lamp. The width of the road is 4 m. Illumination is 0.6 lux. Assume efficacy of lamp as 70 Lumen/watt. (10)

Or

- (b) (i) With neat diagram explain the construction and working of CFL lamp. (8)
(ii) Explain the various steps followed in calculation of illumination for designing the residential lighting. (8)
14. (a) (i) Draw a neat sketch of induction furnace and explain its working. (6)
(ii) An insulating material 2 cm thick and 150 sq.cm. in area is to be heated by dielectric heating. The material has permittivity of 4 and p.f. as 0.04. Power required is 400 watts and frequency of 40 MHz. Determine the voltage and the current that will flow through the material. If the voltage were limited to 700 volts, what will the frequency to get the same loss? (10)

Or

- (b) (i) Discuss the principle of arc welding and the difference between carbon and metal arc welding and their relative merits and demerits. (8)
- (ii) Explain the characteristics of a welding transformer. (8)
15. (a) (i) Explain about multi motor speed control. (8)
- (ii) A sub-urban electric train has a maximum speed of 65 kmph. The schedule speed including a station stop of 30 seconds is 43.5 kmph. If the acceleration is 1.3 kmphs, find the value of retardation when the distance between stops is 3 k.m. (8)

Or

- (b) (i) Explain the principle and operation of a modern ac locomotive. (6)
- (ii) What are the various types of electric braking used in traction? Discuss in detail. (10)

