

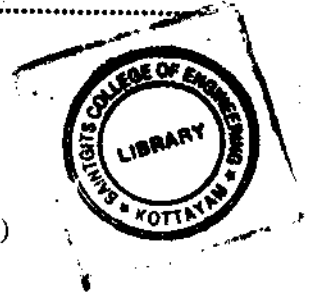
B.TECH. DEGREE EXAMINATION, MAY 2014**Sixth Semester**

Branch : Electrical and Electronics Engineering

EE 010 601—POWER GENERATION AND DISTRIBUTION (EE)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]



Time : Three Hours

Maximum : 100 Marks

Part A

*Answer all questions briefly.
Each question carries 3 marks.*

1. Explain the function of spill ways.
2. What are fixed and running charges ?
3. What are the limitations of Kelvin's Law ?
4. What is the importance of load power factor in AC distribution ?
5. What is energy efficient lighting ?

(5 × 3 = 15 marks)

Part B

*Answer all questions.
Each question carries 5 marks.*

6. Discuss the function of condenser in steam power plant. What are the types of condensers ?
7. Explain plant use factor and capacity factor.
8. Derive the expression for the voltage drop in a uniformly loaded distributor fed at one end.
9. Explain feeder, distributor and service mains.
10. Explain demand side energy management.

(5 × 5 = 25 marks)

Turn over



Part C

Answer all questions.
Each full question carries 12 marks.

11. (a) Draw and explain the schematic arrangement of gas turbine plants. (8 marks)
(b) Discuss the advantages and disadvantages of steam power plants. (4 marks)

Or

12. (a) Draw the layout of thermal powerplant and explain its operation. (8 marks)
(b) Discuss the factors for the choice of site for a nuclear power plant. (4 marks)

13. (a) Explain the terms load factor and diversity factor? How do these factors influence the cost of generation?

(8 marks)

- (b) Calculate the annual bill of a consumer whose maximum demand is 100 MW, p.f = 0.8 lagging and load factor = 60%. The tariff used is Rs. 75 per KVA of maximum demand plus 25 paise per KWh consumed.

(4 marks)

Or

14. (a) What are the desirable characteristics of tariff? Explain flat rate tariff and block rate tariff.

(8 marks)

- (b) A generating station has a maximum demand of 500 MW. The annual load factor is 50% and capacity factor is 40%. Find the reserve capacity of the plant.

(4 marks)

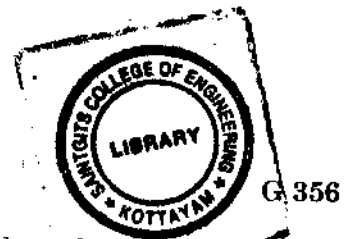
15. (a) Explain the design considerations in a distribution system. On what basis distribution systems are classified?

(8 marks)

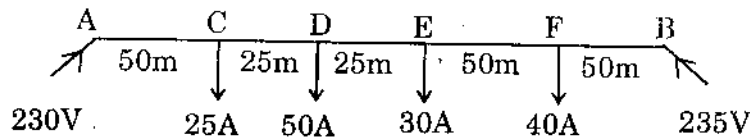
- (b) A uniform 2 wire dc distributor 500 metres long is loaded with 0.4 ampere/metre and is fed at one end. If the maximum permissible voltage drop is not to exceed 10 V, find the cross sectional area of the distributor. Take $\rho = 1.7 \times 10^{-4} \Omega \text{ cm}$.

(4 marks)

Or



16. (a) A 2-wire d.c. distributor AB is fed from both ends and is loaded as shown in figure. The resistance per k.m. of one conductor is 0.3Ω . Calculate the currents in various sections of the distributor and the minimum voltage at the point at which it occurs.



(8 marks)

- (b) What is the purpose of inter connector in d.c. ring main distributor?

(4 marks)

17. Write short notes on the following :

- Effects of switching of capacitor banks.
- Power loss estimation in distribution systems.
- Optimum power factor for distribution systems.

(4 × 3 = 12 marks)

Or

18. A single phase distributor 2 km long supplies a load of 120 A at 0.8 p.f. lag at its far end and a load of 80 A at 0.9 pf lag at its midpoint. Both power factors are referred to the voltage at the far end. The resistance and reactance per km. for go and return are 0.05Ω and 0.1Ω respectively. If the voltage at the far end is maintained at 230 V, calculate the sending end voltage and the phase angle between voltages at the two ends.

(12 marks)

19. Explain in detail how energy saving is achieved in lighting systems.

(12 marks)

Or

20. Explain the following :—

- Energy management.
- Types of energy audit.

(6 × 2 = 12 marks)

[5 × 12 = 60 marks]