

**Code No: 183BX****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech II Year I Semester Examinations, February - 2024****POWER SYSTEM - I****(Electrical and Electronics Engineering)****Time: 3 Hours****Max. Marks: 60****Note:** This question paper contains two parts A and B.i) **Part- A** for 10 marks, ii) **Part - B** for 50 marks.

- Part-A is a compulsory question which consists of ten sub-questions from all units carrying equal marks.
- Part-B consists of **ten questions** (numbered from 2 to 11) **carrying 10 marks each**. From each unit, there are two questions and the student should answer one of them. Hence, the student should answer five questions from Part-B.

**PART- A****(10 Marks)**

- 1.a) What is the use of air pre heater in a steam power station? [1]
- b) Write the function of moderator. [1]
- c) Define diversity factor. [1]
- d) Write different types of tariff methods. [1]
- e) What is sag template? [1]
- f) Define GMR for transmission lines. [1]
- g) What are the different types of bus bar arrangements? [1]
- h) Give the classification of substations. [1]
- i) What is the need of power loss calculation in a distribution system? [1]
- j) What is Ring Main Distributor? [1]

**PART - B****(50 Marks)**

- 2.a) Explain the role and potentiality of solar power in India.
- b) Explain the concept of how ocean energy is produced. [5+5]

**OR**

3. Draw a typical layout of a thermal power plant and describe the function of each component. [10]

- 4.a) Explain two part tariff and compare it with power factor tariff.
- b) A generating station has a connected load of 23 MW and a maximum demand of 20MW, the unit generated being  $61.5 \times 10^6$  per annum. Calculate (i) demand factor (ii) load factor. [5+5]

**OR**

- 5.a) Explain the importance of load curve in a generation system.  
b) A factory has a maximum load of 240 kW at 0.8 p.f. lag, with an annual consumption of 50,000 units. The tariff is Rs 50 per kVA of maximum demand plus 10 paise per unit. Calculate the flat rate of energy consumption. What will be annual saving if p.f. is raised to unity? [5+5]
- 6.a) What do you understand by grading of insulators? Explain.  
b) Find out the capacitance of a single-phase line 30 km long consisting of two parallel wires each 15 mm diameter and 1.5 m apart. [5+5]
- OR**
- 7.a) What are bundled conductors ? Discuss the advantages of bundled conductors when used for overhead lines.  
b) Explain different types of insulators used in transmission lines. [5+5]
- 8.a) Explain the constructional aspects of gas insulated substations.  
b) Make comparison between indoor and outdoor substations. [5+5]
- OR**
- 9.a) Discuss how the site for the substation is selected  
b) Explain with a neat layout diagram of a main and transfer bus bar arrangement. [5+5]
- 10.a) Explain in detail the classification of distribution systems.  
b) A 2-wire DC street mains AB, 600m long is fed from both ends at 220V, loads of 20A, 40A, 50A and 30A are tapped at distances of 100m, 250m, 400m and 500m from the end A respectively. If the area of cross section of distributor conductor is  $1\text{cm}^2$ , find the minimum consumer voltage. Take  $\rho = 1.7\mu \Omega\text{-cm}$ . [5+5]
- OR**
11. Explain the design features of D.C as well as A.C distribution systems. [10]

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