R09

Code No: 54008

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, March/April – 2021
POWER SYSTEMS–I
(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1. Draw the line diagram of a thermal power station and explain the functions of various units of the system. [15]

2.a) What are the various components of Nuclear reactor? Explain their functions and materials used for the construction of these components.
b) Explain the construction and working of CANDU reactor with a neat sketch. [8+7]

3.a) Compare AC and DC distribution systems.
b) A d.c two wire distributor XY 350m long is fed from both ends X and Y at 230 V and 232 V respectively. It is loaded as follows (distances from X):
50 A at 80m, 100 A at 140 m, 80 A 200m and 40 A at 270 m. The resistance of each conductor is 0.005 ohm per 100m. Find the point of minimum voltage and show graphically the current and voltage distribution along the distributor. [7+8]

4. A 1-phase AC distributor has a total resistance of 0.2 ohm and a reactance of 0.3 ohm. At mid point 'A', a current of 100 A at 0.6 p.f lag and at far end 'B' a current of 125A at 0.8 p.f lagging are tapped. If the voltage at the far end is 200 V, find the voltage at supply end and also its phase angle with respect to voltage at far end when:
a) The power factors are with respect to voltages at the load points
b) The power factors are with respect to voltages at far end. [7+8]

5.a) Differentiate about Indoor and outdoor substations.
b) Explain the various schemes of arrangement of bus bars in a substation with relevant diagrams. [7+8]

6. List out different methods of voltage control and explain them in detail. [15]

7.a) Define the following:
i) load factor ii) demand factor iii) diversity factor iv) plant capacity factor v) plant use factor.
b) The annual input to a sub transmission system is 87,000MW. On the peak load of the year the peak is 25 MW and the energy input that day is 300 MWhr. Find the load factor for the year and for the peak load day. [8+7]

8.a) What is Tariff? Why tariff is needed for power supplied? Explain different types of tariff.
b) Calculate the number of units to be consumed so that the annual bill on the basis of two-part tariff is same from the following data:
Maximum demand : 10MW
Two-Part tariff :Rs 1,200/annum/kW of maximum demand + Rs 1.80/kWh consumed.
Flat rate tariff – Rs 2.40/ kWh. [7+8]

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