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Code No: 124AD

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, March - 2022
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.a) Draw the schematic diagram of a modern Nuclear Power Station (NPS) and explain its operation.
b) Discuss the advantages and disadvantages of Nuclear Power Station. [8+7]

2.a) Using the block diagram approach explain the operation of Gas Power Stations in detail.
b) Explain the role of economizer and cooling towers in Thermal Power Stations. [7+8]

3.a) What are the advantages of doubly fed distributor over singly fed distributor?
b) A 2 – core distributor cable 400 meters long supplies a uniformly distributed lighting load of 1 amp per meter. There are concentrated loads of 120, 72, 48 and 120 Amperes at 40, 120, 200 and 320 meters respectively from the end A. The cable has a resistance of 0.15 ohm per km run. Determine the position of the lowest - run lamp and its voltage when the cable is fed at 250 V from both ends A and B. [8+7]

4.a) Derive an expression for the power loss in a uniformly loaded distributor fed at one end.
b) Explain various design features of A.C distribution system. [7+8]

5.a) Explain the single Bus - bar with Bus sectionalizer scheme with a neat connection diagram.
b) Draw the schematic diagram of main and transfer bus arrangement? Explain. [8+7]

6. Explain in detail about constructional aspects of gas insulated substation. State its advantages and disadvantages. [15]

7.a) Explain the role of shunt and series capacitors in p.f. correction.
b) 3 - phase, 5kW induction motor has a p.f. of 0.75 lagging. A bank of capacitors is connected in delta across the supply terminals and p.f. raised to 0.9 Lagging. Determine the kVAR rating of the capacitors connected in each phase. [7+8]

8.a) Explain briefly the following types of tariff in electrical system.
i) power factor tariff
ii) Block rate part tariff
b) Calculate annual bill of a consumer whose maximum demand is 100KW, p.f =0.8 lagging and load factor = 60%. The tariff used is Rs.75/KVA of maximum demand plus 15 paise per KWh consumed. [8+7]

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