Code No: 124AD

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, May - 2019
POWER SYSTEMS-I
(Electrical and Electronics Engineering)

Time: 3 Hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a)	What is the need of super heater?	[2]
b)	What is mean by Nuclear Fission?	[3]
c)	Compare the DC vs. AC distribution systems.	[2]
d)	What is the importance of load power factors in AC distribution?	[3]
e)	What is a substation?	[2]
f)	State the advantages of outdoor substations over indoor substations.	[3]
g)	What are the causes of low power factor?	[2]
h)	List the methods of voltage Control.	[3]
i)	What is the need of integrated load duration curve?	[2]
j)	What are the desirable characteristics of a tariff?	[3]

PART-B

(50 Marks)

2.a) What are the merits and demerits of thermal power generation?
 b) What are the various types of Condensers? Explain its working principle with necessary
  diagram.   [5+5]

OR

3.a) Explain with the help of neat diagram the construction and working of a nuclear power
  plant.
 b) What are the various factors which must be considered while selecting a site for a nuclear
  power plant?   [5+5]

4.a) State the main types of distribution systems used and compare their applications.
 b) A 2-wire distributor cable AB is 2km long and supplies loads of 50A, 100A and 150A
  situated at 0.4 km, 1 km and 1.6km from the point A. Each conductor has a resistance of
  0.05 ohm/km. Calculate the potential difference at each point if a potential difference of
  400V is maintained at point A.   [5+5]

OR

5.a) What is ring main distributor? Explain.
 b) A single phase distributor ABC fed at A. The power factors are lagging and expressed
  relative to the voltage at the far end. The impedances between the sections AB and BC is
  $(0.2 + j\ 0.1)\ \Omega$. If the voltage at the far end is 240 V, calculate the voltage at the supply
  end and also its phase angle with respect to the far end.   [4+6]

6.a) Draw substations layout showing the location of all the substation equipment? Explain.
  b) Explain the sectionalized single bus bar system with relevant diagram. [5+5]

OR

7.a) Compare the air insulated substations and Gas insulated substations.
  b) Describe the construction aspects of gas insulated substations. [5+5]

8.a) What do you understand by sizing of the capacitors?
  b) A 3-phase synchronous motor is connected in parallel with a load of 750kW at 0.85 p.f. lagging. The synchronous motor has a total load of 150 kW and its excitation is so adjusted that the overall power factor becomes 0.95 lagging. Calculate the kVA input to the motor and its power factor. Neglect motor losses. [5+5]

OR

9.a) Discuss the effect of series capacitor on voltage control with neat diagram.
  b) Explain the booster transformer with neat diagram. [5+5]

10.a) Define the load curve and illustrate it with different demands.
   b) Daily load of an industry is 250kW for first 1 hour, 100 kW for next 7 hours, 70 kW for next 8 hours and 1 kW for the remaining time. If the tariff in force is Rs. 1,000 per kW of maximum demand per annum plus Rs. 2.3 per kWh, determine the electricity expenditure per year. [5+5]

OR

11.a) What are the various tariff methods used in power industry. Explain them.
   b) A generating station is to supply in an urban area having the following particulars:
   i)1000 houses with average connected load of 2.5 kW in each house, the demand factor is 0.4 and diversity factor is 2.8
   ii)15 factories having overall maximum demand of 200 kW
   iii)10 bore wells of 7.5 kW each and operating together in the morning
   The diversity factor among above the three types of customers is 1.3. What should be the minimum capacity of generating station? [5+5]

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