Code No: 157DE

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, February/March - 2022
POWER PLANT ENGINEERING
(Mechanical Engineering)

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

Answer any five questions
All questions carry equal marks

1.a) Describe the different types of overfeed stokers and discuss the merits and demerits of each over others.
b) Explain in detail with the help of line diagram, the implant handling of coal along with coal dust and its control. [7+8]

2.a) Explain the advantages and working details with the help of a neat diagram the fluidized bed combustion.
b) Explain the principle of operation of pulverized coal burning system used in the grate of a steam boiler. [7+8]

3.a) What do you understand by supercharging? Under what conditions, the supercharging is advisable. Justify.
b) Draw the layout of gas turbine power plant along with the auxillary components and discuss the limitations. [8+7]

4.a) Differentiate between open cycle gas turbine power plant and closed cycle gas turbine power plant.
b) Explain the construction and operational features of different types of dams constructed in India. [7+8]

5.a) Draw the hydrological curve and discuss its importance in the establishment of hydro power generation unit.
b) How to select the better location for hydropower plants? Also discuss the methods to achieve the required water head in the dams. [7+8]

6.a) Differentiate between nuclear fusion and nuclear fission and discuss the suitable fertile material required for both the reactions.
b) How does the fast breeder reactor function? Explain it with a suitable diagram and discuss its applications. [8+7]

7.a) What do you understand by the term radiation hazards? Explain different methods to minimize the radiation hazards.
b) Explain different standards maintained by Indian government in order to control the pollutions from the thermal power plants. [8+7]

8.a) Draw the same load curve of any power plant and discuss the methods to estimate the demand factor, load factor and diversity factors.
b) A steam power plant has installed capacity of 120 MW and a maximum demand of 100 MW. The coal consumption is 0.4 kg per kWh and the cost of the coal is Rs 80 per ton. The annual expenses of salaries and other overhead expenses excluding coal are Rs 5 crores. The plant works on load factor 0.5 and the capital cost of the power station is Rs 4 crores. If the rate of interest and depreciation is 10%, then calculate the cost of power generation for kWh. [7+8]

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