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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech IV Year I Semester Examinations, April/May - 2018
POWER PLANT ENGINEERING
(Mechanical 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)	Why there is no chimney in the case of a locomotive boiler?	[2]
b)	What are the advantages of artificial draught over natural draught?	[3]
c)	What are the limitations of gas turbines?	[2]
d)	Draw the layout of diesel power plant.	[3]
e)	Differentiate between dams and spillways used in hydro electric power plants.	[2]
f)	What are the different types of dams?	[3]
g)	What are the fertile materials used in the nuclear power plants?	[2]
h)	What are the major sources for the radiation hazards in nuclear power plants?	[3]
i)	What is the impact of power plants on environment?	[2]
j)	List out the methods of pollution control.	[3]

PART-B
(50 Marks)

2.a) Enumerate and explain the steps involved in coal handling.
b) Explain the general layout of ash handling and dust collection systems. [5+5]

OR

3.a) Explain the working of spreader stoker with neat sketch.
b) What are the different types of cooling towers? Explain with a neat sketch. [5+5]

4.a) Describe the various methods used for starting diesel engine. Describe the correct sequence of steps for starting and stopping procedure.
b) What are the essential components of a simple open cycle gas turbine plant? How inter cooling and regeneration help in improving thermal efficiency of the plant? [5+5]

OR

5.a) Discuss the wet sump lubrication system pertaining to a diesel engine.
b) What methods are used to improve the efficiency of gas turbine power plant? [5+5]

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6.a) How to make use of the tides for power generation based on their capacities? Explain the principle of operation.

b) Give the classification and discuss the typical layouts of hydro projects. [5+5]

OR

7.a) What is a spillway? Why spillways are required? What are the different types of spillways?

b) Explain with a neat sketch a pumped storage hydro plant, state its advantages. [5+5]

8.a) Explain the construction and working of nuclear power plant with a layout.

b) Describe with the help of a neat sketch, the construction working of a pressurized water reactor. What are the advantages and disadvantages? [5+5]

OR

9.a) How the Graphite can be used in the nuclear power plant reactors? Explain the special requirement of Graphite in the reactions.

b) List out the advantages and disadvantages of nuclear plants over conventional thermal plants. [5+5]

10.a) The peak load on a power station is 30 MW. The loads having maximum demands of 25 MW, 10MW, 5 MW and 7 MW are connected to the power station. The capacity of the power station is 40MW and annual load factor is 50 %, find: i) Average load on the power station ii) Energy supplied per year iii) Demand factor iv) Diversity factor.

b) Explain the significance of: i) Load factor ii) Diversity factor iii) Plant capacity factor iv) Plant use factor. [5+5]

OR

11.a) The following data is given for a steam power plant: Maximum Demand 25,000 kW; Load factor 40%; Coal consumption 0.86 kg/kWh; Boiler efficiency 85%; Turbine efficiency 90%; Price of coal Rs. 55 per Ton; Determine: i) Thermal efficiency of the station ii) Coal bill of the station for one year.

b) Draw the load curve for the power requirement in India and discuss the methods to fulfill the part load conditions. [5+5]

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