Code No: 117GP

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]

- 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]

www.manaresults.co.in

R13

- 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]

---00000----