Code No: 157DE

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, January/February - 2023
POWER PLANT ENGINEERING
(Mechanical Engineering)

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

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	List out various components in steam power plant.	[2]
b)	What is the need of dust collectors in a steam power plant?	[3]
c)	What are the functions of lubrication system?	[2]
d)	What is the function of draught in gas turbine plant?	[3]
e)	Write the list of advantages and disadvantages of water power.	[2]
f)	What do you understand by hydrology? Explain the hydrological cycle.	[3]
g)	What are the functions of a reflector?	[2]
h)	What are homogeneous and heterogeneous reactors?	[3]
i)	Write about diversity factor.	[2]
j)	What is demand factor and its importance?	[3]

PART – B

(50 Marks)

2.a) Describe various methods used to fire pulverized coal.
b) How the energy resources are utilized in India for power generation and discuss the technological developments for power generation? [5+5]

OR

3.a) With the help of line diagram, explain the mechanical ash handling system.
b) Explain the working of over feed stoker with principle. [5+5]

4.a) Describe the working of a closed cycle gas turbine power plant. Mention its advantages and disadvantages.
b) Mention the different methods of fuel injection used in Diesel plants. Which method is mostly used? [5+5]

OR

5.a) Discuss the wet sump lubrication system pertaining to a diesel engine.
b) Draw the layout of combined cycle power generation unit and derive the equation for the thermal efficiency of the plant. [5+5]

6.a) What are typical ponds and storage units suitable for installation of hydroelectric power plants? Explain them.

b) What are the different factors to be considered while selecting the site for hydroelectric power plant? [5+5]

OR

7.a) Classify and explain the different types of dams and spill ways.

b) How are the Hydroelectric power plants classified? Explain them in detail. [5+5]

8.a) Draw the Nuclear reactor cross section and explain its working giving all details of components.

b) What are different breeding and fertile materials used for power generation in Nuclear reactors? Discuss them. [5+5]

OR

9.a) Enumerate the factors involved in selecting the materials for the various reactor components

b) Explain in brief about radioactive waste disposal. [5+5]

10.a) A generation station supplies the following loads 15MW, 12MW, 8MWand 0.5MW. The station has a maximum demand of 20MW and the annual load factor is 0.5.
Find i) Number units supplied annually ii) Diversity factor.

b) Discuss briefly about the various methods available to restrict industrial pollution. [5+5]

OR

11.a) The annual peak load on a 30 MW power station is 25MW. The power station supplies load haring maximum demands of 10 MW, 8.5 MW, 5 MW, 4.5 MW. The annual load factor is 0.45. Calculate Average load, Diversity factor, Energy supplied per year and demand factor.

b) What are the effects of SO_2, NO_2 and hydrocarbons on the human and crop lives? [5+5]

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