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Code No: 137FT

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, July/August - 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)	What is the function of a cooling tower?	[2]
b)	Explain the uses of draught system.	[3]
c)	What are the different auxiliaries used in gas turbine power plants?	[2]
d)	What are the salient points of fuel cells working?	[3]
e)	Compare and contrast between hydrograph and pondage.	[2]
f)	List out the types of solar collectors and their characteristics?	[3]
g)	What are the different nuclear fuels used in the nuclear power plants?	[2]
h)	What are the waste materials released in the nuclear power plants?	[3]
i)	Explain different pollution standards in India?	[2]
j)	Explain the significance of the diversity factor.	[3]

Part-B

(50 Marks)

2.a) Explain the working principle of feed water treatment with neat diagram and explain the need of feed water treatment.

b) Classify the stokers and explain the working details of them. [5+5]

OR

3. Draw line diagram of modern steam power plant system and explain its working in detail giving the salient points. [10]

4. Explain the significance of supercharging in diesel power plant and explain lubrication systems involved with neat diagrams. [10]

OR

5.a) Discuss the working details of MHD Generation and its advantages.

b) Explain the methods used to improve the efficiency of gas turbine power plant? [5+5]

6.a) How do you classify the dams and spill ways and explain the significance of both.

b) Explain the significance of hydrological survey in the site selection of hydro power plant. [5+5]

OR

7.a) Compare and contrast the HAWT and VAWT in their functioning.

b) Explain the different methods of generating power from the tidal energy resources. [5+5]

8.a) With the help of a sectional diagram, explain the essential components of a nuclear reactor and its working.

b) Explain the special features of sodium-graphite reactor with a neat sketch. [5+5]

OR

9.a) Why the Graphite is used in the nuclear power plant reactors? Explain the special requirement of Graphite with the help of reactions.

b) Bring out the advantages and disadvantages of nuclear plants over conventional thermal plants in all possible areas. [5+5]

10. 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: (a) Thermal efficiency of the station (b) Coal bill of the station for one year. [10]

OR

11. What are the different pollutants present in the environment due to various power plants particularly thermal and nuclear? Also explain the methods to control the pollutants.[10]

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