Hi-Tech Institute of Engineering & Technology (220)

Sub Code: KME 076

B.TECH.

(SEM VII) THEORY EXAMINATION 2023-24

POWER PLANT ENGINEERING

Time: 3 Hours **Total Marks: 100**

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt all questions in brief.

Q No.	Question	Marks	CO
a.	Define the term "Breeding".	2	4
b.	How load factor effect the cost per kWh?	2	1
c.	Briefly explain fossil fuel pollution.	2	5
d.	Differentiate between Wet sump and Dry sump lubrication system.	2	2
e.	What do you mean by turbo charging?	2	2
f.	What is Thermal neutron?	2	3
g.	List out conventional power plants?	2	2
h.	What is runoff?	2	2
i.	Define brake power.	2	1
j.	What are different types of pollution from power generation.	2	5

SECTION B

2. Attempt any three of the following:

Q No.	Question	Marks	CO
a.	What do you mean by Incremental Heat Rate? Explain the' principal of economic scheduling the load among the different units, of a power plant.	10	5
b.	Explain the working of a typical fast breeder nuclear reactor power plant, with neat diagram.	10	4
c.	Discuss the essential components of the diesel power plant with neat layout.	10	2
d.	The value of equipment is Rs. 500,000 and its salvage value at the end of its useful life of 15 years is Rs. 100,000. Find the value of the equipment at the end of 5 years of its use by the following methods: - (i) Straight line depreciation. (ii) Sinking fund depreciation, when it is compounded annually at 10%.	10	1
e.	What are the properties of materials used for conductor? Name the materials used for conductors	10	5

SECTION C

3. Attempt any one part of the following:

Q No.	Question	Marks	CO
a.	What do you understand by cost of electrical generation?	10	5
b.	Explain the working of FBC (Fluidized Bed Combustion) with neat sketch. State the advantages of FBC system over conventional system.	10	1

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4. Attempt any one part of the following:

Q No.	Question	Marks	CO
a.	What is depreciation? Describe the sinking fund method for calculating depreciation rate of any power plant equipment.	10	5
b.	Explain how reheating improves the efficiency of a simple open cycle gas turbine plant.	10	3

5. Attempt any one part of the following:

Q No.	Question	Marks	CO
a.	Discuss the effect of pressure ratio on Brayton cycle output and efficiency.	10	3
b.	With the help of a sketch, discuss the constructional detail of a generator. Why is there a need of generator cooling?	10	5

6. Attempt any one part of the following:

Q No.	Question	Marks	CO
a.	Explain different types of collectors used in a solar power plant.	10	3
b.	In an open cycle regenerative gas turbine plant, the air enters the compressor at 1 bar abs 32°C and leaves at 6.9 bar abs. The temperature at the end of combustion chamber is 816°C. The isentropic efficiencies of compressor and turbine are respectively 0.84 and 0.85. Combustion efficiency is 90% and the regenerator effectiveness is 60 percent, determine: (i) Thermal efficiency, (ii) Air rate, (iii)'Work ratio	10	2

7. Attempt any one part of the following:

Q No.	Question	Marks	CO
a.	What is a circuit breaker? What are the different types of circuit breakers that are employed in typical power stations?	10	5
b.	With the help of a sketch, discuss the ring and bridging Bus-Bar arrangement of electrical equipment.	10	5

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