

B. TECH
(SEM VII) THEORY EXAMINATION 2022-23
POWER PLANT ENGINEERING

Time: 3 Hours

Total Marks: 70

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

SECTION A

1. Attempt all questions in brief. 2x7 = 14

- (a) Differentiate between Renewable and non-renewable sources based power plants.
- (b) Define load factor.
- (c) Explain the working of super heater in a boiler.
- (d) Explain the function of coal pulverizer.
- (e) Explain fission reaction.
- (f) Discuss about geothermal energy.
- (g) Why cooling of transformer is required? Explain.

SECTION B

2. Attempt any three of the following: 7x3 = 21

- (a) With the help of a neat line diagram, explain the working of Benson boiler.
- (b) Draw a neat line diagram of a diesel power plant showing all the components and explain function of all its main components.
- (c) Explain the parameter to be kept in the mind while selecting a site for Gas turbine plant. Also compare Gas turbine plant with diesel power plant.
- (d) With the help of a neat line diagram, explain the working of Pressurized Water reactor (PWR).
- (e) Explain any three methods of cooling of power transformer.

SECTION C

3. Attempt any one part of the following: 7x1 = 7

- (a) Explain Load curve. State the method of drawing load duration curve with the help of load curve using suitable example.
- (b) Draw general layout of Steam power plant and explain function of its major components.

4. Attempt any one part of the following: 7x1 = 7

- (a) Classify and explain all the draft systems with neat sketches.
- (b) Explain Coal handling process and also draw flow diagram for coal handling plant.

5. Attempt any *one* part of the following: 7x1 = 7

- (a) With neat sketches, explain any two supercharging methods.
- (b) A gas turbine unit has a pressure ratio of 6:1 and maximum cycle temperature of 610°C. The isentropic efficiencies of the compressor and turbine are 0.80 and 0.82 respectively. Calculate the power output in kilowatts of an electric generator geared to the turbine when the air enters the compressor at 15°C at the rate of 16 kg/s. Take $c_p = 1.005$ kJ/kg K and $\gamma = 1.4$ for the compression process, and take $c_p = 1.11$ kJ/kg K and $\gamma = 1.333$ for the expansion process.

6. Attempt any *one* part of the following: 7x1 = 7

- (a) Draw layout of Nuclear power plant and explain function of all its vital components.
- (b) Classify Hydro electric power plants.

7. Attempt any *one* part of the following: 7x1 = 7

- (a) Explain any two methods of tariff.
- (b) Write an essay on power plant pollution and its remedies.

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