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Eighth Semester B.E. Degree Examination, June/July 2014

Power Plant Engineering

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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PART – A

1 a. Draw a general layout of a steam power plant, showing the different circuits and system and explain them. **(10 Marks)**

b. Explain with a neat sketch of chain grate stoker. **(06 Marks)**

c. Write the merits and demerits of pulverized coal. **(04 Marks)**

2 a. What are the requirements of good coal handling plant? **(04 Marks)**

b. Explain with neat sketch: i) Benson boiler, ii) Loeffler boiler **(12 Marks)**

c. What are characteristics of a good ash handling plant? **(04 Marks)**

3 a. Explain the forced, induced, balanced draught chimneys. **(06 Marks)**

b. Explain with sketch: i) Air preheater, ii) Superheater. **(08 Marks)**

c. Calculate the mass of flue gases flowing through the chimney when the draught produced is equal to 1.9 cm of water. Temperature of flue gases is 290°C and ambient temperature is 20°C. The flue gases formed per kg of fuel burnt are 23 kg. Neglect the losses and take the diameter of the chimney as 1.8 m. **(06 Marks)**

4 a. Explain with neat sketch the air intake system and exhaust system of diesel power plant. **(12 Marks)**

b. Sketch and explain the layout of a diesel engine power plant. **(08 Marks)**

PART – B

5 a. Explain the following:
i) Water hammer ii) Pumped storage plant iii) Surge tank on ground level **(12 Marks)**

b. What are the advantages and disadvantages of hydro-electric plants? **(08 Marks)**

6 a. Give the classification of nuclear reactors. **(06 Marks)**

b. Sketch and explain gas cooled reactor and also list its advantages. **(10 Marks)**

c. What are safety measures for nuclear power plants? **(04 Marks)**

7 a. Define: i) Demand factor, ii) Load factor, iii) Diversity factor
iv) Utilization factor v) Capacity factor vi) Use factor **(12 Marks)**

b. A base load power station and standby power station share a common load as follows:
Base load station annual output = 180×10^6 KWh; Base load station capacity = 42 Mw; Maximum demand on base load station = 36 MW; Standby station capacity = 22 MW; Standby station annual output = 17×10^6 KWh; Maximum demand (peak load) on standby station = 18 MW.
Determine the following for both power stations:
i) Load factor ii) Capacity (or plant) factor. **(08 Marks)**

8 a. Explain the performance and operating characteristics of power plant. **(08 Marks)**

b. Give the requirements of Tariff. **(04 Marks)**

c. What are different types of tariffs? Explain any two of them. **(08 Marks)**

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