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10ME833

Eighth Semester B.E. Degree Examination, June/July 2016
Power Plant Engineering

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer FIVE full questions, selecting at least TWO questions from each part.***
2. ***Use of steam tables/cost analysis charts/ TD handbook is permitted.***

PART – A

1 a. Explain the working of a spreader stoker with the help of a neat diagram and state its limitations. **(10 Marks)**

b. Sketch and explain the following pulverized fuel handling systems:
i) Unit system ii) Central or bin system **(10 Marks)**

2 a. Mention the important properties of coal used in power plant applications. **(05 Marks)**

b. What are the principal advantages of forced circulation boilers? **(05 Marks)**

c. What are the factors to be considered in selection of a boiler? Explain with a neat diagram, a Velox boiler. **(10 Marks)**

3 a. Explain Draught and give its classification. **(06 Marks)**

b. Explain the function of a superheater and mention its advantages. **(04 Marks)**

c. A chimney of 28 m high and the temperature of hot gases inside the chimney is 320°C. The temperature of outside air is 23°C and furnace is supplied with 15 kg of air per kg of coal burnt. Calculate:
i) Draught in mm of water
ii) Draught head in meters of hot gases. **(10 Marks)**

4 a. State the applications of diesel engines in power field. **(05 Marks)**

b. What are the advantages and disadvantages of diesel power plant and gas turbine power plant? **(05 Marks)**

c. Explain air intake and admission system of diesel power plant with a neat sketch and mention the precautions should be taken care while constructing it. **(10 Marks)**

PART – B

5 a. Hydro projects are developed for what purpose? List the advantages and disadvantages of hydro electric power plants. **(10 Marks)**

b. The mean monthly discharge at a particular site is given in table below. Draw the hydrograph and the flow duration curve.

Month	Discharge, m^3/s	Month	Discharge, m^3/s
January	200	July	2000
February	450	August	2400
March	600	September	1800
April	1200	October	1200
May	1500	November	800
June	1600	December	400

(10 Marks)

6 a. Explain Pressurized Water Reactor (PWR) power plant with a neat schematic diagram. **(08 Marks)**

b. Write short notes on disposal of radioactive wastes. **(04 Marks)**

c. Explain with a neat sketch the elements of the nuclear reactor. **(08 Marks)**

7 a. Define the following:

i) Load factor
ii) Utility factor
iii) Capacity factor
iv) Demand factor
v) Diversity factor **(10 Marks)**

b. A power station has to supply load as follows:

Time (hrs)	0-6	6-12	12-14	14-18	18-24
Load (MW)	45	135	90	150	75

i) Draw the load curve.
ii) Draw load duration curve.
iii) Choose suitable generating units to supply the load.
iv) Calculate the load factor.
v) Calculate the plant capacity factor. **(10 Marks)**

8 a. Name some important remedies to reduce the cost of power generation. **(05 Marks)**

b. For what purpose the expenses are made in a construction cost of a power plant? **(05 Marks)**

c. The capital cost of a power generating equipment in a steam power plant is RS 80×10^6. The useful life of the plant in 30 years and its salvage value is 5% of the capital cost. Determine by the sinking fund method the amount of money to be saved annually for replacement if yearly rate of compound interest is 6%. **(10 Marks)**

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