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10ME833

Eighth Semester B.E. Degree Examination, Dec.2014/Jan.2015

Power Plant Engineering

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Explain with a neat sketch the principle of "overfeed stoker". **(06 Marks)**

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

c. List the advantages of stoker firing over pulverized system of firing. **(04 Marks)**

2 a. Classify the ash handling system. Explain pneumatic or vacuum extraction ash handling system with a neat sketch. **(10 Marks)**

b. Explain with a neat sketch the working of a Benson boiler. Mention its advantages. **(10 Marks)**

3 a. Define draught. Sketch and explain induced draught. **(06 Marks)**

b. What is a cooling tower? Explain the working of natural draught hyperbolic cooling tower with a neat sketch. **(07 Marks)**

c. Explain the functions of economizer and air preheater. Also, differentiate between regenerative and recuperative air preheater. **(07 Marks)**

4 a. With a neat sketch, explain diesel engine exhaust system. **(05 Marks)**

b. With a neat sketch, explain thermostat cooling method employed in diesel engines. **(05 Marks)**

c. List the advantages of a gas turbine power plant. With a neat sketch, explain closed cycle gas turbine plant. **(10 Marks)**

PART – B

5 a. With a neat sketch, explain the pumped storage plant. Mention its advantages. **(07 Marks)**

b. What is a surge tank? Why is it important in a hydro-plant? **(03 Marks)**

c. The run off data of a river at a particular site is tabulated below:

Month	Mean discharge in millions of Cu m per month	Month	Mean discharge in millions of Cu m per month
Jan	80	July	150
Feb	50	Aug	200
Mar	40	Sep	250
Apr	20	Oct	120
May	0	Nov	100
June	100	Dec	80

i) Draw a hydrograph and find the mean flow.
ii) Draw the flow duration curve.
iii) Find the power in MW available at mean flow if the head available is 100 m and overall efficiency of generation is 80%. **(10 Marks)**

6 a. With the help of a neat sketch, show the important parts of a nuclear reactor describing briefly the function of each part. **(08 Marks)**

b. Sketch and explain Sodium-Graphite reactor. Mention its advantages. **(08 Marks)**

c. Write a short note on radiation hazards. **(04 Marks)**

7 a. What are the considerations to be made while selecting the suitable site for a power plant? **(04 Marks)**

b. What is a load curve? Give the graphical representation of a load curve. What is its significance in power generation? **(06 Marks)**

c. Explain the following terms:
i) Load factor
ii) Capacity factor
iii) Demand factor
iv) Diversity factor
v) Plant use factor **(10 Marks)**

8 a. Discuss in detail the performance and operating characteristics of power plants. **(10 Marks)**

b. What do you understand by the term "tariff"? List various types of tariffs and explain any two of them with graphical representation. **(10 Marks)**

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