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10ME833

Eighth Semester B.E. Degree Examination, Dec.2015/Jan.2016

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. Draw the general layout of steam power plant and explain the component of it. (08 Marks)
- b. With a neat sketch and combustion equations explain overfeed and underfeed mechanism of burning coal. (06 Marks)
- c. List the advantages and disadvantages of pulverized fuel. (06 Marks)
- 2 a. Sketch and explain Loeffler coiler and also justify why forced circulation is necessary for high feature boiler. (10 Marks)
- b. List and explain in brief the feature and advantages of high process boiler. (07 Marks)
- c. List the steps in coal handling. (03 Marks)
- 3 a. With a neat diagram explain indirect dry cooling lower with conventional surface condensers and also draw temperature path lengths. (08 Marks)
- b. With a simple sketch explain brick type regenerative air preheater. (08 Marks)
- c. List and explain the different method of controlling the temperature of superheated steam. (04 Marks)
- 4 a. List advantages disadvantages and applications of direct engine power plant. (12 Marks)
- b. Sketch and explain open cycle gas turbine with T – S diagram. (08 Marks)

PART – B

- 5 a. Explain the terms hydrograph, Mass curve water hammer, surge tank and Penstocks. (10 Marks)
- b. The run off data of a river at a particulars site is tabulated below.

Month	Mean discharge in millions of m ³ / month	Month	Mean discharge in millions of m ³ / month
Jan	40	July	70
Feb	25	Aug	100
Mar	20	Sep	105
Apr	10	Oct	60
May	0	Nov	50
June	50	Dec	40

- 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)

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.

- 6** a. Sketch and explain liquid metal reactor. (03 Marks)
b. Define the terms Mass defect, fission reaction and nuclear fuels. (07 Marks)
c. Define multiplication Ratio and explain the conditions to be satisfied for self sustained chained reaction to calature. (10 Marks)
- 7** a. Define load factor, diversity factor, plant capacity factor demand factors and plant use factor. (10 Marks)
b. The peak load for a power station is 35MW the loads having maximum demands of 20MW, 10MW, 5MW and 7MW are connected to the power station. They are connected to the power station. The capacity of power station is 40MW and annual load factor is 55%
Find :
i) Average load on power station
ii) Annual energy supplied
iii) Demand factor
iv) Diversity factor (10 Marks)
- 8** a. Explain briefly straight line meter, step meter and block meter tariff. (09 Marks)
b. List the requirements of tariffs. (05 Marks)
c. Explain the performance and operating characteristics of power plant. (06 Marks)

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