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10ME53

Fifth Semester B.E. Degree Examination, Dec.2014/Jan.2015
Energy Engineering

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART - A

1 a. With a neat sketch, explain the working of spreader stoker. State the advantages and disadvantages. **(10 Marks)**

b. With a neat sketch, explain hydraulic ash handling system. **(06 Marks)**

c. List the different types of fuels used for steam generation. **(04 Marks)**

2 a. Explain with a neat sketch, working of Volex boiler. **(08 Marks)**

b. Draw the neat sketch of Induced Draugh system. Explain. **(08 Marks)**

c. What are Super heaters and Economiser? **(04 Marks)**

3 a. Explain the necessity of cooling system in diesel engine. With the help of neat sketch, explain thermostat cooling and thermisiphon cooling. **(08 Marks)**

b. Draw schematic layout of diesel power plant and explain function of the components. **(12 Marks)**

4 a. Classify Hydro – electric power plant. **(04 Marks)**

b. Explain with neat sketches, any three different types of surge tank. **(06 Marks)**

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

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

i) Draw 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 100m and overall efficiency of generation is 80%. **(10 Marks)**

PART - B

5 a. With the help of neat diagram, explain the working of Liquid Metal Cooled Reactor. **(08 Marks)**

b. Explain about disposal of solid, liquid and gaseous wastes produced by Nuclear Power Plant. **(07 Marks)**

c. Explain advantages and disadvantages of Nuclear power plant. **(05 Marks)**

6 a. Draw a neat sketch, explain Solar Pond Electric Power Plant. Draw concentration and temperature profile. **(08 Marks)**

b. Briefly explain the working of solar cell. **(04 Marks)**

c. Wind blows with velocity of 16m/s at 15^0C. The turbine diameter is 115m with operating speed of 40 rpm at maximum efficiency. Assume 1 standard atmospheric pressure and propeller wind turbine. Calculate the following :
i) Total power density in the wind stream ii) Maximum obtainable power density
iii) Reasonably obtainable power density, $\eta = 35\%$ iv) Total power
v) Torque and axial thrust. **(08 Marks)**

7 a. With a neat sketch and TS diagram, explain closed cycle OTEC. **(07 Marks)**
b. Draw a neat sketch and explain the working of Double basin tidal power plant. **(06 Marks)**
c. With a neat sketch, explain the working of Vapour dominated – total flow concept Geothermal system. **(07 Marks)**

8 a. Explain the factors affecting Biogas generation. **(10 Marks)**
b. With a neat sketch, explain the working of Updraft gasifier. Mention the temperature ranges. **(07 Marks)**
c. Write a note on Energy plantation. **(03 Marks)**

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