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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 Vortex boiler. (08 Marks)
- b. Draw the neat sketch of Induced Draught 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 cfd/month	Month	Mean Discharge in millions of cfd/month
Jan	40	July	70
Feb	25	Aug	100
Mar	20	Sept	105
Apr	10	Oct	80
May	0	Nov	50
June	50	Dec	40

- 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°C. 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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