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# P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

**Eighth Semester, B.E. - Mechanical Engineering**

**Semester End Examination; July - 2021**

**Power Plant Engineering**

Time: 3 hrs

Max. Marks: 100

**Note:** Answer any **FIVE** full questions.

- 1 a. Explain the method of harnessing tidal energy. Mention the advantage and disadvantages of tidal power generation. 10
- b. A power plant has the following annual factors:  
Load factor = 0.75, capacity factor = 0.65, maximum demand is 60 MW. Estimate;
- i) Annual energy production 10
- ii) Reserve capacity and above the peak load
- iii) The hours during which the plant is not in service per year
- 2 a. List the advantage and disadvantages of geothermal energy. Discuss problems associated with geothermal energy harvesting. 10
- b. What is fuel cell? Describe the principle of working of fuel cell with reference H<sub>2</sub>-O<sub>2</sub> cell. 10
- 3 a. Define the following:
- i) Hydrograph
- ii) Unit hydrograph 4
- iii) Flow duration curve
- iv) Mass curve
- b. How hydroelectric power plants are classified? 6
- c. With the help of neat diagram, explain the working of speeder stroker. Mention its advantages. 10
- 4 a. Sketch and explain the following pulverised fuel and handling system: 10
- i) Unit system                      ii) Bin system
- b. The run off data of a river at a particular site is tabulated below:

Month	Mean discharge per month (million of Cu.m)	Month	Mean discharge per month (million of Cu.m)
Jan	40	July	75
Feb	25	August	100
Mar	20	September	110
April	10	October	60
May	0	November	50
June	50	Dec	40

Draw a hydrograph and find the mean flow, also draw flow duration curve. Find the power in MW available at mean flow if the head available is 80 M and overall efficiency of the generation is 85%. Take each month of 30 days. 10

- 5 a. Discuss with a neat sketch working of La Mout Boiler. 10
- b. Clarify ash handling system. Explain the working of pneumatic ash handling system with neat sketch. 10
- 6 a. Define draught and explain forced draught with neat sketch. 6
- b. Explain the function of air pre heater and super heater in thermal power plant. 4
- c. Define cooling tower and explain the principle of operation of hyperbolic cooling tower with a neat sketch. 10
- 7 a. Draw a general layout of diesel power plant and explain all the system employed in it. 10
- b. Explain different methods of starting the diesel engine. 6
- c. State the application of diesel engine power plant. 4
- 8 a. Explain the necessity of cooling system in diesel engine with help of neat sketch. Explain thermostat and thermo siphon cooling system. 10
- b. Mention the important function of lubrication system. 4
- c. Mention the difference between open cycle gas turbine and closed cycle gas turbine. 6
- 9 a. Define Nuclear reactor. Explain Nuclear reactor with a neat sketch. 10
- b. Draw a schematic sketch of a gas cooled reactor, briefly explain its principle of working . List its merits and demerits. 10
- 10 a. Explain boiling water reactor with a neat sketch. 6
- b. Mention advantages and disadvantages of Nuclear power plant. 4
- c. Write a note on :
- i) Radiation Hazards 10
- ii) Radioactive Waste disposal

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