



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 following with a neat sketch: 10
 - i) Thermoelectric power generation
 - ii) Harnessing of Tidal energy
- b. The annual peak load on a 30 MW power station is 25 MW. The Power station supplies loads having maximum demands of 10 MW, 8.5 MW, 5 MW and 4.5 MW. The annual load factor is 45%. Find; 10
 - i) Average load
 - ii) Energy supplied per year
 - iii) Diversity factor
 - iv) Demand factor
- 2 a. Explain the working of hydrogen-oxygen fuel cell with a neat sketch. 10
- b. A power station is to supply three region of load whose peak loads are 20 MW, 15 MW and 25 MW. The annual load factor is 50% and the diversity factor of the load at the station is 1.5. Determine the following; 10
 - i) Maximum demand on the station
 - ii) Installed capacity suggesting number of unit
 - iii) Annual energy supplied
- 3 a. Define run-off and list the factors which affect run-off. 4
- b. Write the classifications of hydroelectric power plants. 6
- c. Explain various elements of general arrangements for a hydroelectric power plant with a neat sketch. 10
- 4 a. The run off data of a river at a particular site is tabulated below:

Month	Mean discharge in millions of m ³ /month	Month	Mean discharge in millions of m ³ /month
January	200	July	2000
February	450	August	2400
March	600	September	1800
April	1200	October	1200
May	1500	November	800
June	1600	December	400

- i) Draw hydrograph ii) Draw Flow duration curve
- b. With the help of neat diagram, explain the working of spreader stoker. 10

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| 5 a. | Discuss with a neat sketch, the working of Lamont Boiler. | 10 |
| b. | Explain the working principle of Pneumatic ash handling system with a neat sketch. | 10 |
| 6 a. | Explain Forced draught system. | 8 |
| b. | Describe the working of the Wet cooling tower with suitable sketch. | 8 |
| c. | Sketch and explain screw conveyor. | 4 |
| 7 a. | List the factors to be considered for site selection of diesel power plant. | 4 |
| b. | Explain the importance of lubrication system in diesel power plant. | 4 |
| c. | List the methods of starting diesel engine. Explain any one. | 4 |
| d. | Draw a neat diagram of a cooling system used for diesel power plant showing all the essential components. | 8 |
| 8 a. | With necessary sketches, explain Direct closed cycle and Indirect closed cycle gas turbines. | 10 |
| b. | List the advantages, disadvantages and applications of gas turbine power plants. | 10 |
| 9 a. | Write short notes on Nuclear fission and Nuclear fusion reactions. | 10 |
| b. | With a neat sketch, explain the components of a nuclear reactor. | 10 |
| 10 a. | Explain with a neat sketch Boiling Water Reactors (BWR). | 10 |
| b. | Explain Gas cooled reactor with a neat sketch. | 10 |

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