USN | | | | | | | | | | 17ME71

Seventh Semester B.E. Degree Examination, July/August 2021
Energy Engineering

Time: 3 hrs.   Max. Marks: 100

Note: *Answer any FIVE full questions.*

1 a. Explain with sketch, overfeed and underfeed principle of firing coal. Mention their advantages and disadvantages. **(10 Marks)**

   b. Draw a line diagram of pneumatic ash handling system and explain its working. Mention its advantages. **(10 Marks)**

2 a. What are the function of i) Super heater ii) Economiser iii) Air preheater iv) Cooling tower v) Re - heater. **(10 Marks)**

   b. What do you understand by the term draught? Classify types of draughts. Explain with a neat sketch the balanced draught. **(10 Marks)**

3 a. List the applications of diesel electric power plant and explain with neat sketch air intake and exhaust system. **(10 Marks)**

   b. Explain the necessity of the cooling system in a diesel engine. With the help of neat diagram, explain the working of Thermostat cooling. **(10 Marks)**

4 a. Define i) Hydrograph ii) Flow duration curve iii) Surge tank iv) Water hammer. **(10 Marks)**

   b. 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
Jan	40	July	70
Feb	25	August	100
March	20	Sept	105
April	10	October	60
May	0	Nov	50
June	50	Dec	40

   i) Draw hydrograph and find the mean flow.

   ii) Draw flow duration curve.

   iii) Find the power is MW available at mean flow, if the head available is 100m and overall efficiency of generation is 80%. **(10 Marks)**

5 a. What is Beam radiation? Name solar radiation measuring instruments and explain with neat sketch pyrheliometer for measuring beam radiation. **(10 Marks)**

   b. Give classification of solar collectors. Explain with a neat sketch, solar flat plate collector. **(10 Marks)**

6 a. Write short note on :
      i) Solar pond   ii) Solar Air heater.

(10 Marks)

   b. Sketch and explain Vapour absorption solar Refrigeration system. **(10 Marks)**

7 a. Explain with neat sketch, vertical axis type wind mill. **(10 Marks)**

   b. A 10m/sec wind is at 1 standard atm pressure and 15^0C temperature. Calculate
   i)   The total power density in the wind stream.
   ii) The maximum obtainable power density.
   iii) A reasonable obtainable power density.
   iv) The total power in KW produced if the turbine diameter is 120m.
   v)   The Torque if the turbine operating at 40 rpm and maximum efficiency of 40%.

                                                                                 (10 Marks)

8 a. How Tidal power plants are classified? Draw a neat sketch and explain the working of double basin Tidal power plant. **(10 Marks)**

   b. Write short note on the following :
   i)   Wave Energy.
   ii) Advantages and disadvantages of Tidal power plant. **(10 Marks)**

9 a. What is meant by Anaerobic digestion? What are the factors which affect biodigestion? Explain any two in brief. **(10 Marks)**

   b. How are the gasifiers classified? With a neat sketch, explain the working of downdraft gasifier. **(10 Marks)**

10 a. Write short note on the following :
   i)   Fuel cell   ii)   Disposal of Nuclear waste. **(10 Marks)**

   b. What is Green Energy? With a neat sketch, explain the closed cycle OTEC system. **(10 Marks)**

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