Sem VII /CBSGS/mech/ PPE/ m-J-17

07|06|17

(3 Hours) [Total Marks: 80]

N.B.: (1) Question No. 1 is compulsory.
     (2) Answer any three from the remaining five questions.
     (3) Assumptions made if any should be justified.
     (4) Figures to the right indicate full marks.

1. Write short notes on any four of the following.   20
   a) Ash Handling System
   b) Pressurized Water Reactor
   c) Surge tank
   d) Combined Cycle using PFBC
   e) Load Curves

2. a) Discuss the various method of improving the performance of a gas turbine   10
    power plant.
   b) The following data relate to a 2000 kW Diesel power station: 10

The peak load on the plant	= 1500 kW
Load factor	= 0.4
Capital cost per kW installed	= Rs 1200
Annual costs	= 15% of capital
Annual operating costs	= Rs 50000
Annual maintenance costs:	
i) Fixed	= Rs 9000
ii) Variable	= Rs 18000
Cost of fuel	= Rs 0.45 per kg
Cost of lubricating oil	= Rs 1.3 per kg
C.V. of fuel	= 41800 kJ/kg
Consumption of fuel	= 0.45 kg/kWh
Consumption of lubricating oil	= 0.002 kg/kWh

    Determine the following
    i) The annual energy generated.
    ii) The cost of generation per kWh.

[TURN OVER]

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3. a) Draw the schematic layout of a Hydro Electric Power Plant and discuss the   10
function of each component and operation of plant.

   b) Discuss Rankine cycle with the help of schematic, (T-s) and (h-s) diagram.   10
Write the expressions for efficiency, work ratio, heat rejected.

4. a) The data for monthly flow for a Hydel plant at a site for 12 months is given   10
below.

Month	1	2	3	4	5	6	7	8	9	10	11	12
Flow in m³/sec	6	4	5.4	2	1.5	1	1.2	4.5	8	4	3	2

Find the size of the reservoir and possible rate of available flow. Also draw the
hydrograph and flow duration curve.

   b) With the help of a neat diagram, explain working of Pulverized Coal system   10
with its advantages and disadvantages.

5. a) Steam enters the high pressure turbine at 12 MPa and 600°C and is condensed 10
in the condenser at a pressure of 10 kPa. If the moisture content of the steam at
the exit of low pressure turbine is not to exceed 12 percent. Determine pressure
at which the steam should be reheated upto temperature 600 °C and thermal
efficiency of the cycle.

   b) With a neat diagram discuss the working of a Liquid Metal Sodium Graphite   10
Reactor (LMSGR) power plant . Write its advantages and disadvantages.

6. a) What do you understand by the term tariff ? Explain the Blockmeter rate,   10
Hopkinson demand rate, and Doherty rate of tariffs.

   b) Briefly explain CANDU Reactor and Dust Collection System.   10

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