QP Code : **6088**

(3 Hours) [Total Marks : 80

N.B.: (1) Question **No. 1** is compulsory.
(2) Answer any three from the remaining five questions.
(3) Assume suitable data if required and mention it clearly.
(4) Figures to the right indicate full marks.

1. Write short notes on any **four** of the following. 20
   a) Base load and Peak load plants.
   b) Advantages of combined cycle power plant.
   c) Mini and Micro hydel power plants.
   d) Closed cycle gas turbine power plant.
   e) Components of nuclear reactor.

2. a) Prove that for economical load sharing in a power plant, the incremental 10
   rate (dI/dL) of all power generating units must be equal.
   b) The average rate of inflow during 12 months for river are as follows 10

month	Inflow Q (m³/s)	month	Inflow Q (m³/s)	month	Inflow Q (m³/s)
Jan	700	May	600	Sep	1200
Feb	1000	June	1100	Oct	600
Mar	600	July	2200	Nov	600
Apr	500	Aug	2400	Dec	1100

   i) Plot hydrograph and find average flow.
   ii) Draw flow duration curve and,
   iii) Find power developed in MW under head of 155 m if overall efficiency
   is 87%. Take each month of 30 days.

3. a) What factors should be considered while selecting the site for steam power 10
   plant?
   b) The yearly load duration curve of power plant is considered as straight line 10
   from maximum 340 MW to minimum 90 MW. Power is supplied by one
   unit of 200 MW and two units of 120 MW each. Determine-
   i) Installed capacity. ii) Plant factor. iii) Load factor. iv) Utilisation factor.

4. a) Describe the various methods to improve performance of gas turbine power 10
   plant.
   b) Explain coal handling system in detail. 10

[TURN OVER

5. a) The compressor and turbine unit of a small gas turbine plant have an   10
        isentropic efficiency of 88%. The inlet air temperature of compressor is
        at 20 °C and maximum temperature during the cycle is limited to 750 °C.
        The pressure ratio is 4. Calculate specific output, overall efficiency of
        cycle. Take $\gamma = 1.4$ and neglect all losses.
    b) What is radioactivity and radioactive decay? Prove that halftime is inversely   10
        proportional to decay constant λ.

6. Explain any **four**   20
    a) Combined gas turbine cycle with nuclear power plant.
    b) Fluidized bed combustion system.
    c) CANDU reactor.
    d) Tariff methods.
    e) Modified Rankine cycle.