

(3 hours)

Total Marks : 80

- N.B. :**
- 1) Question No. 1 is compulsory.
  - 2) Attempt any three questions from remaining Five.
  - 3) Assume suitable Data wherever necessary.
  - 4) Justify your answers with diagrams and graphs.

- Q.1** Write short notes on any four:- 20
- i) Mechanical Dust collector.
  - ii) Run-off river plant
  - iii) Different types of Tariff methods.
  - iv) Classification of nuclear power plants.
  - v) Advantages of Gas power plant over other power plants.
- Q.2 (a)** Explain CANDU type nuclear reactor with neat sketch mentioning type of fuel, moderator used. Give advantages and disadvantages. 10
- Q.2 (b)** The incremental fuel costs for two generating units A and B of a power plant are given as: 10
- $$dF_A / dP_A = 0.065P_A + 25$$
- $$dF_B / dP_B = 0.08P_B + 20$$
- Where F is fuel cost in rupees per hour and P is power output in MW.  
Find: i) The economic loading of two units when the total load supplied by the power plant is 160 MW.  
ii) The loss in fuel cost per hr if the load is equally shared by both units.
- Q.3(a)** Explain BWR. How does it differ from PWR? 10
- Q.3(b)** What are the advantages of a pumped storage hydro-power plant? Draw a neat sketch and explain. 10
- Q.4 (a)** From the following data, estimate the generating cost of the power delivered by the station and find the reserve capacity available. 10
- |  |   |                            |
|--|---|----------------------------|
| Installed capacity of the plant:                       | = | 142.5Mw                    |
| Annual Load factor:                                    | = | 60%                        |
| Capacity factor:                                       | = | 50%                        |
| Capital cost of the plant:                             | = | Rs. 130 x 10 <sup>6</sup>  |
| Annual cost of coal, oil, tax and salary:              | = | Rs. 18.8 x 10 <sup>6</sup> |
| Rate of Interest and Depreciation each:                | = | 5 % of Capital             |
| Units of energy used to run plant auxiliary: supplied. | = | 6% of total units          |
- Q.4 (b)** Define the following: 10
- i) Load factor, ii) Diversity factor, iii) Plant capacity factor iv) Plant use factor and v) demand factor .

- Q.5 (a) With neat sketch explain combined cycle power generation with merits and demerits. 10
- Q.5 (b) Explain Sodium Graphite Reactor with its advantages and disadvantages. 10
- Q.6 Write short notes on any four of the following: 20
- i) Surge Tank
  - ii) Rainfall measurements
  - iii) Parameters affecting Thermodynamic efficiency of combined cycle
  - iv) Pneumatic ash handling system
  - v) Classification of power plants.

\*\*\*\*\*