



- Notes :
1. All questions carry marks as indicated.
  2. Solve Question 1 OR Questions No. 2.
  3. Solve Question 3 OR Questions No. 4.
  4. Solve Question 5 OR Questions No. 6.
  5. Solve Question 7 OR Questions No. 8.
  6. Solve Question 9 OR Questions No. 10.
  7. Solve Question 11 OR Questions No. 12.
  8. Assume suitable data whenever necessary.
  9. Illustrate your answers whenever necessary with the help of neat sketches.
  10. Use of non programmable calculator is permitted.
  11. Use of Mollier chart and steam table permitted.

1. a) A residential load of a locality is given below : 10

Time (Hrs)	Load (KW)
0 - 5	02
5 - 6	06
6 - 9	20
9 - 18	00
18 - 21	12
21 - 24	18

Draw the load curve and find out the load factor and energy consumed during 24 hrs.

- b) What are the effects of variable load on power plant design and operation. 4

**OR**

2. a) What is the significance of two part tariff and three part tariff ? Explain the advantages of each over other. 5

- b) The following data pertains to a power plant of 120 MW capacity. 9

The capital cost = Rs. 15000/kw

Interest and depreciation = 10% on capital

Annual running charges = Rs.  $20 \times 10^6$

Profit to be gained = 10% of the capital

The energy consumed by power plant auxiliaries = 5% of generated.

The annual load factor = 0.6

Annual capacity factor = 0.5

Calculate :

i) The reserve capacity of plant

ii) Cost of generation per kwh

3. a) Draw and explain layout of steam power plant. 6

- b) Explain rankine cycle with regeneration and reheating. 7

**OR**

4. a) Explain combined power generation & explain its significance & its advantages. **7**  
b) Explain the following in steam power plant - **6**  
i) Feed water heater  
ii) Cogeneration
5. a) Write a short note on analysis of coal. **6**  
b) What are the various fuel firing methods in a boiler ? Explain any one in detail with neat sketch. **7**

**OR**

6. a) Define high pressure boiler ? Explain any one high pressure boiler with neat diagram. **7**  
b) Explain the following in brief in steam generation with suitable diagram. **6**  
i) Economiser  
ii) Air preheater
7. a) Explain the factor considered for site selection of hydro-electric power plant. **7**  
b) Give the classification of hydroelectric power plant. **7**

**OR**

8. The mean monthly discharge for 12 months at a particular site of a river is tabulated below. **14**

Month	Discharge in millions of m <sup>3</sup> /month
A (April)	500
M (May)	200
J (June)	1500
J (July)	2500
A (Aug)	3000
S (Sept)	2400
O (Oct)	2000
N (Nov)	1500
D (Dec)	1500
J (Jan)	1000
F (Feb)	800
M (Mar)	600

Draw

- a) Hydrograph for given discharge and find average monthly flow.  
b) Find the power available at mean flow of water, if its available head is 80 meter at the site and overall efficiency of the generation is 80%. Take 30 days in month.
9. a) What are the various solid wastes generated in nuclear power plant ? How they are disposed off ? **7**

b) What do you understand by the term binding energy ? Explain its significance. 6

**OR**

10. a) Explain the working of CANDU type reactor and gives its advantages and disadvantages over other types. 7

b) Draw neat sketch of Boiling water reactor (BWR) Explain its working mentions its advantages and limitations. 6

11. a) Explain various method to improve thermal efficiency of gas turbine. 7

b) Explain the working of diesel power plant with neat sketch & mention its advantages & disadvantages. 6

**OR**

12. Write a short notes on the following **any three**. 13

i) Photovoltaic power generation.

ii) Wind energy.

iii) Ocean energy

iv) Geothermal energy

v) MHD power generation.

\*\*\*\*\*

