

Sem VII / CBGS / MECH / PPE / M-J-16  
EXTRA

05

QP Code : 31481

( 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
- Economic Load Sharing
  - Parameters affecting thermodynamic efficiency of combined cycles.
  - Nuclear waste disposal.
  - Rainfall measurement methods.
  - Electrostatic precipitator
2. a) With the help of flow chart explain coal handling system. 10  
 b) The following data pertains to a power plant of 120 MW capacity. 10
- |  |   |                          |  |
|--|---|--------------------------|--|
| Capital cost                               | = | Rs. 1500/kW              |  |
| Interest and Depreciation                  | = | 10% on Capital           |  |
| Annual Running charges                     | = | Rs. 20 x 10 <sup>6</sup> |  |
| Profit to be gained                        | = | 10% on Capital           |  |
| Energy consumed in power plant auxiliaries | = | 5% of generated          |  |
| Annual Load factor                         | = | 0.6                      |  |
| Annual capacity factor                     | = | 0.5                      |  |
- Calculate i) Reserve capacity ii) Cost of generation per kWh.
3. a) What is PWR? How it differs from BWR? 10  
 b) Classify Hydroelectric power plant. Explain pumped storage power plant with neat sketch. 10
4. a) With a neat sketch explain combined cycle power generation with merits and demerits. 10  
 b) What are the advantages of fluidised bed combustion? Explain PFBC with neat diagram. 10

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5. a) The run off data of a river at a particular site is tabulated below as shown in The Table: 10

Month	Mean Discharge per month ( millions of cu m)	Month	Mean Discharge per month (millions of cu m)
January	40	July	75
February	25	August	100
March	20	September	110
April	10	October	60
May	0	November	50
June	50	December	40

- i) Draw the hydrograph and find the mean flow  
 ii) Draw the flow duration curve.  
 iii) Find the power in MW available at mean flow if the head available is 80 m and overall efficiency of generation is 85%. Take each month of 30 Days.
6. a) What are the advantages of Gas turbine power plant over Diesel and Thermal Power plant? 8  
 b) State the methods to improve Thermal efficiency of Gas turbine. 4  
 c) Write a note on tariffs of electrical energy. 8