**Total No. of Questions : 12]**

SEAT No. :

**P3581**

[Total No. of Pages : 3

## [4959]-1051

### B.E. (Mechanical S/W)

# POWER PLANT ENGINEERING

## (2012 Pattern) (Self Study - IV)

*Time : 3 Hours]*

*[Max. Marks : 100*

***Instructions to the candidates:***

   *1) Answer any three questions from each section.*

   *2) Neat diagrams must be drawn wherever necessary.*

   *3) Figures to the right indicate full marks.*

   *4) Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*

   *5) Assume suitable data, if necessary.*

## SECTION - I

*Q1)* a) Explain pulverized coal firing system with neat sketch. **[8]**

   b) Write a short note on classification of fuels. **[8]**

OR

*Q2)* a) Explain with neat sketch what is Fluidized Bed combustion. **[8]**

   b) Explain the working of a Reheat cycle with a schematic layout and T-S diagram. **[8]**

*Q3)* a) Draw a neat sketch of Benson boiler and discuss its merits and demerits as compared with velox boiler. **[8]**

   b) Discuss various factors which are to be considered while selecting site for thermal power plants. **[8]**

OR

*Q4)* a) Explain with neat sketch working of Electrostatic precipitator. **[8]**

   b) Write a short note on a travelling Grate stoker. **[8]**

*P.T.O.*

*Q5)* a) Explain working of Pelton Wheel turbine with neat sketch. **[9]**

b) Explain working of Hydropower plant with a neat sketch. **[9]**

OR

*Q6)* a) Write a short note on working of Kaplan turbine. **[9]**

b) Explain advantages & disadvantages of Hydro-Power plant. **[9]**

### SECTION - II

*Q7)* a) Explain with neat sketch main parts of nuclear reactor & working of each part. **[8]**

b) Write a short note on Nuclear waste disposal. **[8]**

OR

*Q8)* a) Write a short note on Nuclear fission. **[8]**

b) Describe with neat sketch main components & working of diesel power plant. **[8]**

*Q9)* a) Explain with neat sketch working of simple gas power plant. **[8]**

b) Explain with neat sketch working of Bio mass plant. **[8]**

OR

*Q10)* a) Explain with neat sketch working of open cycle and closed cycle gas power plant. **[8]**

b) Write a short note on tidal power generation. **[8]**

*Q11)* a) Explain the terms : Load factor, Reserve factor, Plant use factor and Capacity factor. **[8]**

b) The rated capacity of power plant is 400 MW. The peak load on the plant is 350 MW. The various consumer groups having maximum demand of 120 MW, 100 MW, 80 MW & 90 MW are connected to the power plants. The annual load factor is 0.8. Calculate : **[10]**
   i) The average load
   ii) The capacity factor
   iii) Demand factor
   iv) Reserve factor
   v) The diversity factor

OR

**Q12) a)** A power station has to supply load as follows :

| Time (hours) | 0-6 | 6-8 | 8-10 | 10-12 | 12-16 | 16-20 | 20-22 | 22-24 |
|---|---|---|---|---|---|---|---|---|
| Load (MW) | 40 | 80 | 90 | 100 | 75 | 120 | 100 | 80 |

Capacity factor of the plant is 0.6

Work out following : **[9]**

i) Load Curve

ii) Average Load

iii) Load factor of the plant

iv) Reserve factor

v) Capacity of the plant

b) Prove that for economic load distribution between power plants A and B

$$\frac{dI_A}{dL_A} = \frac{dI_B}{dL_B}.$$  **[9]**

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