

Total No. of Questions : 12]

SEAT No. :

P4426

[Total No. of Pages : 3

[4859]-1115
B.E. (Mechanical Sandwich)
Power Plant Engineering
(2012 Pattern) (Self Study - IV)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) *Answer any three from section 1 and 2.*
- 2) *Neat diagram 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) A steam turbine receives steam at 15 bar and 350°C and exhaust to condenser at 0.06 bar. Determine the thermal efficiency, Specific steam consumption and work ratio of ideal Rankine cycle. [8]
- b) Explain the device which is used to find calorific value of liquid fuel. [8]

OR

- Q2)** a) A steam turbine receives steam at 20 bar and 400°C and exhaust to condenser at 0.06 bar. Determine the thermal efficiency, Specific steam consumption and work ratio of ideal Rankine cycle. [8]
- b) Explain the Boys gas calorimeter to find calorific value of gaseous fuel. [8]
- Q3)** a) What are the features of high pressure boilers. [4]
- b) Explain with neat sketch Benson boiler. What are the advantages of Benson boiler. [8]
- c) Explain the concept of fluidized bed combustion. [5]

OR

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- Q4)** a) Explain with neat sketch Velox boiler. What are the advantages of Velox boiler. [8]
b) Explain various methods of treatment of feed water. [5]
c) Compare induced draught and forced draught system. [4]

- Q5)** a) Discuss the parameters on which the selection of site for hydraulic power plant depend. [6]
b) Give comparison of hydraulic turbine. [6]
c) What do you mean by spillway? What are various types? [5]

OR

- Q6)** a) Explain with neat sketch pumped storage plant. [6]
b) On what basis you will select Francis, Pelton and Kaplan turbine for particular site. [6]
c) What do you mean by draft tube? What are the various types of draft tube? [5]

SECTION - II

- Q7)** a) Explain with neat sketch BWR power plant. [6]
b) What do you mean by radioactive decays and radioisotopes. [6]
c) What is heat rate and incremental heat rate. [5]

OR

- Q8)** a) Differentiate between PWR and BWR. [6]
b) Discuss various factors while selecting a site for nuclear power plant. [6]
c) Differentiate between uncontrolled and controlled chain reaction. [5]

- Q9)** a) Give the classification of gas turbines. [6]
b) Compare open cycle and closed cycle gas turbines. [6]
c) What are the relative merits and demerits of tidal power plant. [5]

OR

Q10)a) What is regeneration? How it improves efficiency of open cycle gas turbine plant. [6]

b) Explain fuel cell power plant. [6]

c) What are the limitations solar thermal, and wind power plant. [5]

Q11)a) Explain what you understand by base load and peaking load. Why are base load plants loaded heavily? [6]

b) Explain the effect of load factor on the cost of electricity generated. [4]

c) What do you understand by depreciation? How is the depreciation rate determined? [6]

OR

Q12)a) Explain the following.

i) Demand factor

ii) Average load

iii) Diversity factor [6]

b) How is load duration curve constructed. [4]

c) A 2000 MW thermal power station supplied power to a system having maximum and minimum demand of 1900 MW and 1200 MW respectively in a year. By assuming load duration curve to be straight line over year, calculate i) Load factor ii) Capacity factor iii) Reserve factor. [6]

