Total No. of Questions : 12]

SEAT No. :

P3319

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[4959]-42
B.E.(Mechanical)
POWER PLANT ENGINEERING
(2008 Coures) (Semester-II) (402047)

Time :3Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answer any three questions from each section.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data if necessary.***

SECTION-I

Q1) a) Discuss in details various factors which must be considered in selecting a site for Thermal Power plant? **[6]**

b) Discuss the role & participation of private sector in development of power sector in India. **[6]**

c) Write a short note on Load scheduling. **[6]**

OR

Q2) a) Write a short note on current status of power generation in India **[4]**

b) Write a detail note on carbon credit. **[4]**

c) The peak load on a power plant is 60 MW. The loads having maximum demands of 30 MW, 20MW,10MW and 14MW are connected to the power plant. The capacity of the power plant is 80 MW and the annual load factor is 0.50. Estimate **[10]**

i) the average load on the power plant.

ii) the energy supplied per year

iii) the demand factor

iv) the diversity factor

P.T.O.

Q3) a) Explain construction and working of Fluidized bed combustion system for power plant with its merits and demerits. **[10]**

b) What do you understand by coal beneficiation? **[6]**

OR

Q4) a) Explain principle working of Electrostatic dust collector with the help of neat diagram also enlists merits and demerits. **[10]**

b) What are the various system of ash handling? Explain any one with neat sketch. **[6]**

Q5) a) Discuss various types of dams with neat sketch bring out clearly their applications. **[8]**

b) In an open cycle gas turbine power plant, the maximum pressure and temperature are limited to 5 bar and 650K. The pressure and temperature of the gas entering the compressor are 1 bar & 300K. The exit pressure of the turbine is also 1bar. Assuming isentropic efficiency of the compressor and the turbine to 80% & 85% respectively, calculate the thermal efficiency of the cycle. Take overall A:F ratio as 60:1. Assume Cp=1kJ/kg- °C. Also γ =1.4. If the plant consumes 5 kg of fuel/ sec, find the power generating capacity of the plant. **[8]**

OR

Q6) a) Compare the steam hydro gas power plant on the basis of site, initial cost fuel cost, maintenance cost, cooling water requirements. **[8]**

b) A simple gas turbine takes in air at 1 bar 15 °C and compresses to 6 bar with an isentropic efficiency of 80%. The maximum temperature of the cycle is 750 °C. The isentropic efficiency of turbine being 80%. If the net power developed is 1.1 MW. Estimate the flow rate of gases and air. Assume that there is fall in pressure of 0.1 bar in the combustion system and Cp= 1kJ/kg-K & γ = 1.4. Neglect additional mass flow rate of the fuel in the combustion chamber. The calorific value of the fuel used is 20,000kJ/kg. **[8]**

SECTION-II

Q7) a) Describe the boiling water reactor with the help of neat sketch and explain its chief characteristics. **[10]**

b) What are the desirable properties of a good moderator? **[6]**

OR

Q8) a) Give the layout of diesel engine power plant. What are the advantages and disadvantages of diesel power plants? **[10]**

b) Describe briefly the commonly used starting system in large and medium size engines. **[6]**

Q9) a) Write a note on Magneto Hydrodynamic Power Generation Technology. **[8]**

b) Sketch a typical layout of Geothermal Power Plant and state its advantages and disadvantages. **[8]**

OR

Q10) a) Compare different types of switchgear installations used in a power plant. **[8]**

b) Draw a typical layout of tidal power plant and discuss their advantages. **[8]**

Q11) a) Write a note on Different pollutants from power plants and their effects on human health. **[10]**

b) Discuss various ways to control pollutants which are of particulate matter type. **[8]**

OR

Q12) Write notes on any three. **[18]**

a) Acid Rain: causes, effects & precautions

b) Thermal pollution and its control

c) Global warming and greenhouse effect

d) Pre & Post treatments for SO_2 control.