Total No. of Questions : 12

SEAT No. :

P-1701

[Total No. of Pages :3

[4859]-42
BE (Mechanical)
Power Plant Engineering
(Semester -II) (2008 course)

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

Instructions to the candidates

1) ***Answer three questions from each section.***
2) ***Answer to the two sections should be written in separate answer books***
3) ***Draw diagrams wherever necessary.***
4) ***Use of scientific calculator is allowed.***
5) ***Assume suitable data Wherver necessary.***

SECTION-I

Q1) a) Discuss in detail how unit electricity cost is calculated. What are Fixed and variable costs **[8]**

b) Discuss various factors considered for site selection of 'Thermal power plant'. **[4]**

c) Explain various Tariff Methods for electrical energy in brief. **[4]**

OR

Q2) a) Explain the principle of economic scheduling. **[8]**

b) A thermal power plant consists of two 60 MW units, each running for 8000 hours and one 30 MW unit running for 2000 hours per year. The energy produced by the plant is 876 X 10^6 kWh per year. Determine the plant load factor and plant use factor. Consider the maximum load as equal to the plant capacity. **[8]**

Q3) a) Explain the following: **[8]**

i) Coal - Oil mixture (COM)

ii) Dust collectors.

b) What do you understand by fluidized bed combustion (FBC)? Explain its working principle with neat sketch.

OR

P.T.O.

Q4) a) In a condenser test, the following observation were recorded: **[8]**

Vacuum =715mm of mercury

Barometer = 765mm of mercury

Mean temperature of condensation = 34 deg C

Hot well temperature =29degC

Inlet temperature of cooling water=15degC

Outlet temperature of cooling water = 25degC

Determine:

1) Vacuum corrected to standard barometer of 760 mm.
2) Vacuum efficiency.
3) Undercooling of condensate.
4) Condenser efficiency.

b) Explain the working of electro- static precipitator with neat sketch. What are its advantages and disadvantages? **[8]**

Q5) a) Discuss the various methods to improve the thermal efficiency of gas turbine power plant. **[6]**

b) Write a note on Selection of Hydraulic turbine.' **[6]**

c) Discuss in detail on: 'Free piston engine plant'. **[6]**

OR

Q6) a) Explain with neat sketch combined cycle gas turbine power plant. **[6]**

b) Explain with neat sketch the pumped storage peak load plant. **[6]**

c) Discuss the performance characteristics of gas turbine power plant. **[6]**

SECTION-II

Q7) a) Explain with neat sketch the construction and working of CANDU reactor. **[8]**

b) Diesel power plants are more suitable as peak load plants than base load plants. Justify. **[4]**

c) Classify nuclear reactor. Also state the functions of nuclear reactor. **[4]**

OR

Q8) a) Draw a line diagram to show the layout of Diesel Power plant and describe it in brief. State the function of each component. **[8]**

b) Write note on nuclear waste disposal **[4]**

c) State the functions of any two of the following: **[4]**

i) Moderator

ii) Control rod.

iii) Coolant

Q9) a) Classify Tidal Power plants. What are the advantages and limitations of Tidal Power plant? Explain any one Tidal Power plant with neat sketch **[8]**

b) What is a Circuit breaker? How are circuit breakers classified? Explain any one circuit breaker with neat sketch. **[8]**

OR

Q10)a) State the function of relay system. How are relays classified? Explain any one relay with neat sketch. **[8]**

b) Discuss briefly the principle of Magneto Hydro Dynamic (MHD) Power generation system. **[4]**

c) State the advantages and disadvantages of full cell. **[4]**

Q11) a) Explain the causes and effects of acid rain. **[6]**

b) Write short note on: Thermal Pollution **[6]**

c) What is particulate emission? How is it controlled? **[6]**

OR

Q12) a) Write a note on 'Pollution from Atomic Power Station'. **[6]**

b) Discuss the harmful effects of following on human health and environment **[8]**

i) CO_2

ii) CO

iii) Compounds of sulphur

iv) Oxides of Nitrogen

c) What is Thermal Discharge Index (TDI) **[4]**