

Total No. of Questions :10]

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SEAT No. :

[Total No. of Pages :3

[5670]-540

B.E. (Mechanical Engineering)

ENERGY ENGINEERING

(2015 Course) (Semester-II) (402047) (End Sem.)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8 and Q.9 or Q.10
- 2) Use of thermodynamic table and charts are permitted.
- 3) Assume suitable data, if necessary.
- 4) Figures to right indicate full marks.
- 5) Use of non-programmable electronic calculator is allowed.

Q1) a) What are the factors you will consider for locating the conventional base load thermal power plant? [5]

b) Define condenser efficiency and vacuum efficiency. [5]

OR

Q2) a) What is FBC? Explain its stages with neat sketch. [5]

b) The following data were obtained from the test of a surface condenser- Condenser vacuum = 714 mm of Hg; Hot well temp = 32°C; inlet temp of circulating water = 12°C; Outlet temp of circulating water = 28°C; Barometer reading = 760 mm of Hg. Compute Vacuum and Condenser efficiencies. [5]

Q3) a) Write short notes on Nuclear power plant. State its merits and demerits. [5]

b) Explain with neat sketch hydrograph and hydrological cycle. [5]

OR

Q4) a) Explain with neat sketch working of BWR plant. [5]

b) Write a short note on Flow duration curve. [5]

Q5) a) What are the advantages and disadvantages of Diesel power plant? [8]

b) List the methods of improving efficiency and specific output of the gas turbine. [8]

OR

P.T.O.

Q6) a) In a gas turbine plant, the air is compressed in a single stage compressor from 1 bar to 9 bar and from initial temperature of 300 K. the same air is then heated to a temperature of 800 K and then expanded in the turbine. The air is then reheated to a temperature of 800 K and then expanded in the second stage turbine. Find the maximum power that can be obtain from the installation, if the mass of air circulated per second is 2 kg. Take $C_p = 1 \text{ kJ/kgK}$. [10]

b) Discuss the losses related to diesel power plant. [6]

Q7) a) Write short notes on; [10]

i) Solar flat plate collector

ii) Geothermal power plant

b) Discuss the parameters to be considered for site selection of wind power plant. [6]

OR

Q8) a) What are the different challenges in commercialization of non-conventional power plant? [8]

b) Discuss any two types of the horizontal axis wind mills with neat sketch. [8]

Q9) a) State the various protective equipments and explain the working of switch gear in power plant. [8]

b) A power supply agency, supplies the following load to different consumers, its details given below; [10]

Sr.No.	Particulars	Domestic Load	Commercial Load	Industrial Load	System Diversity factor
1	Maximum Demand	20000kW	20000kW	50000kW	
2	Diversity Factor	1.5	1.4	1.2	1.6
3	Demand factor	0.7	0.8	0.9	

If overall diversity factor is 1.6, determine; 1. maximum Demand of the system.

2. Connected load of each type of consumer.

OR

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Q10)a) Write short notes on: [8]

- i) Circuit breaker
- ii) Control system.

b) A power station has the following daily load cycle: [10]

Time in Hours	6-8	8-12	12-16	16-20	20-24	24-6
Load in MW	20	40	60	20	50	20

Plot the load curve & Load Duration Curve. Calculate load factor, Average Demand & Energy Generated per day

