

Total No. of Questions :10]

SEAT No. :

**P3271**

**[5670]-540**

[Total No. of Pages :3

**B.E. (Mechanical Engineering)**

**ENERGY ENGINEERING**

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

*Time : 2½Hours]*

*[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 =711 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  $C_p=1$  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

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

