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B.E / B.Tech ( Full Time ) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2013

B.E (MECHANICAL ENGINEERING) – ARREAR EXAMINATION

21

VII Semester

ME 9401 POWER PLANT ENGINEERING  
(Regulation 2008)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

**PART-A (10 x 2 = 20 Marks)**

1. What is the maximum efficiency reported in OTEC plants?
2. Give any 2 examples of combined cycle power plants
3. List any 4 advantages of FBC in boilers
4. What type of nuclear reactor is used in Kalpakkam Atomic Power System?
5. Gist on the concept of Hybrid power plants
6. How hydro electric power plants are classified?
7. Mention the techniques used for quantifying the excess air supplied in combustion systems
8. State the necessity of modern control systems for power plants
9. List the deliverables of load duration curves
10. Mention the various cost components involved in fixing the cost of power generation in a typical power plant

**Part – B ( 5 x 16 = 80 marks)**

11. Compare the principle, construction, working, merits and demerits of open and closed cycle of the following power plants
  - (i) Ocean Thermal Energy Conversion systems
  - (ii) Magneto Hydro dynamic generator systems
12. a) (i) Detail on the chemistry of coal gasification in a updraught system  
(ii) Compare the advantages and disadvantages of updraught and down draught gasification systems

OR

- b) With a suitable sketch explain the principle, construction and working of a typical nuclear reactor with all its elements. Also compare the pros and cons of PWR and CANDU nuclear reactor

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13. a) (i) Explain with relevant sketch the working of a typical horizontal axis wind mill with its control system (12)  
(ii) Compare the salient features of vertical axis wind mill vis-à-vis horizontal axis wind mill (4)

OR

- b) (i) With a suitable T-S plot explain the working of binary cycle plants generating power using geothermal energy (12)  
(ii) List the potential geothermal sites in India (4)
14. a) Discuss on any 4 principles employed for measurement of temperature of flue gas in modern thermal power plants

OR

- b) Detail on any 1 technique employed for measurement of ultra low pressure (as that encountered in Rankine cycle condensers) and very high pressure (as that encountered in super critical boilers) in power plants
15. a) The peak load on a power plant is 60 MW. The loads having maximum demands of 30 MW, 20 MW, 10 MW and 14 MW are connected to the power plant. The capacity of the power plant is 80 MW and the annual load factor is 0.50. Estimate (i) average load on the power plant (ii) energy supplied per year (iii) demand factor (iv) diversity factor

OR

- b) A power station supplies the following loads to the consumers :

Time in hours	0-6	6-10	10-12	12-16	16-20	20-22	22-24
Load in MW	30	70	90	60	100	80	60

- (i) Draw the load curve and estimate the load factor of the plant.  
(ii) What is the load factor of a standby equipment of 30 MW capacity if it takes up all loads above 70 MW and What is its use factor ?