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**Question Paper Code : X60859**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020

Sixth/Seventh Semester

Mechanical Engineering

ME 2403/ME 1353/10122 ME 704/ME 73 – POWER PLANT ENGINEERING

(Regulations 2008/2010)

(Common to PTME 2403 – Power Plant Engineering for B.E. (Part-Time) Seventh Semester – Mechanical Engineering – Regulations 2009)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What are the two basic parameters to decide while planning a power plant ?
2. What do you understand by load duration curves ?
3. Define air standard cycle efficiency.
4. What are the advantages of burning coal are in pulverized form ?
5. What is “half life” of nuclear fuels ?
6. Distinguish between ‘Storage’ and ‘Pondage’.
7. Name the various types of diesel engine used for diesel power plants.
8. What are the applications of gas turbine plant ?
9. Which are the non conventional sources of energy and why they are seriously thought throughout the world ?
10. Discuss in detail how the load between two alternators of generating station can be divided for the best economy.



## PART – B

(5×16=80 Marks)

11. a) i) A residential load of a locality is given below :

Time (hours)	0-5	5-6	6-9	9-18	18-21	21-24
Load (kW)	3	7	22	0	15	9

Draw the load curve and find out the load factor and energy consumed during 24 hours.

(10)

- ii) What do you understand by MHD ? Explain the working principle of MHD with neat sketch.

(6)

(OR)

- b) i) What do you understand by FBC ? Explain its working principle with a neat sketch.

(8)

- ii) Draw a neat line diagram of Benson boiler and discuss its relative merits and demerits.

(8)

12. a) i) List down the advantages of burning the fuels in pulverized form.

(8)

- ii) Explain with the help of a diagram, the working of a cyclone separator.

(8)

(OR)

- b) i) List the advantages and disadvantages of surface condensers.

(8)

- ii) Describe with a neat sketch the operation of a hyperbolic cooling tower.

(8)

13. a) Explain the construction and working of Nuclear power plant with a layout.

(16)

(OR)

- b) Describe the classification of turbines used in hydro electric power plants.

(16)

14. a) i) Explain the necessity of the cooling system in a diesel engine. What are the methods of cooling the IC engine ?

(8)

- ii) Discuss the wet sump lubrication system pertaining to a diesel engine.

(8)

(OR)



b) i) Explain with neat sketch the effect of inter-cooling and reheating in a gas turbine power plant. **(10)**

ii) Bring out the difference between the closed and open cycle gas turbine power plants. **(6)**

15.a) Discuss the different type of system used for generating power using geothermal energy.

(OR)

b) A power plant of 210 MW installed capacity has the following particulars :

capital cost = Rs. 18,000/kW,

installed interest and depreciation 12 %

Annual load factor 60%

Annual capacity factor = 54%

Annual running charges = Rs.  $200 \times 10^6$

Energy consumed by power plant auxiliaries 6%

Calculate :

i) the cost of power generation per kWh, and

ii) the reserve capacity.

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