

(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID :120756

Roll No.

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B.Tech.

(SEM. VII) THEORY EXAMINATION, 2015-16

POWER STATION PRACTICE

[Time:3 hours]

[Total Marks:100]

SECTION-A

1. Attempt **all** parts. All parts carry equal marks. Write answer of each part in short. (2×10=20)
 - (a) Write the advantages of using pulverised coal in thermal plant.
 - (b) Why does the value of load factor is always less than one?
 - (c) Name the main parts of Diesel power plant.
 - (d) What is the function of moderator in Nuclear power plant?
 - (e) Define load factor related to power plant economics.
 - (f) What are the components of operating cost?
 - (g) Define penalty factor.

- (h) What do you mean by economic load scheduling?
- (i) What are the advantages of MHD generation?
- (j) What are the different sources of non- conventional energy?

SECTION-B

Attempt **any five** parts of the following. (10x5=50)

2. (a) A thermal power plant spends Rs.25 lakhs in one year on coal consumption. The coal has heating value of 5000 kcal/kg and costs Rs.500/ton. If the thermal efficiency is 35% and electrical efficiency is 90%, find the average load on the power plant.
 - (b) What are the factors which determine the location & site of hydro power plant?
3. What are the different types of hydroturbine? List their applications and discuss their construction features.
4. Discuss in detail open cycle and closed cycle gas turbine plants along with the methods to improve thermal efficiency of gas turbine plant.
5. Explain the working of diesel plant with the help of block diagram. Also mention its advantages, disadvantages & applications.
6. An electric supply system has maximum load of 70 MW. The annual expenses of the system are:
 - Generation Rs. 8,50,000
 - Fuel Cost Rs. 28, 00, 000
 - Transmission Rs. 3,45,000
 - Distribution Rs. 27,50,000
 - Repairs etc Rs. 3,00,000
 The number of units generated per year is 600×10^6 kWh. The consumers have an aggregate maximum demand of 75 MW. Evaluate a two part tariff to be charged from the consumers. Assume that the fixed charges for generation, fuel transmission distribution repairs etc are 90%, 15%, 85%, 95% and 50% respectively. Losses in transmission and distribution are 20%.
7. What do you mean by economic load scheduling? Explain economic load scheduling of thermal plants considering transmission losses.
8. (a) Explain thermionic and thermoelectric converters for direct conversion of solar heat to electricity.
 - (b) What is Geothermal energy? How it is utilized for power generation?
9. Explain generation of electricity by wind mills. What are different types of generators used in wind energy generation? Compare them with their advantages and disadvantages.

SECTION-C

Attempt **any two** parts of the following. (15x2=30)

10. (a) How can the most economical power factor be determined for a consumer installation?
- (b) What are the advantages and disadvantages of using synchronous condensers as compared to static capacitor?
11. Write short notes on the following for hydroelectric plants.
 - (a) Reservoir
 - (b) Trash rack
 - (c) Surge tank
 - (d) Penstock
 - (e) Spillway
12. (a) What are different types of substations? Also Explain different types of bus-bar arrangements at sub-stations.
- (b) Define tidal energy and tidal barrage. Name different tidal power schemes.

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