Code: 15A02402



Max. Marks: 70

B.Tech II Year II Semester (R15) Regular & Supplementary Examinations May/June 2018

ELECTRICAL POWER GENERATING SYSTEMS

(Electrical & Electronics Engineering)

Time: 3 hours

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PART – A

(Compulsory Question)

- Answer the following: (10 X 02 = 20 Marks)
- (a) What is feed water?
- (b) Write the advantages and disadvantages of a thermal power station.
- (c) What are the factors of selection of site for hydroelectric stations?
- (d) Discuss about the hydrograph.
- (e) Define collector efficiency.
- (f) What is meant by pitch angle?
- (g) Distinguish between tidal and wave power generation.
- (h) What is geothermal power?
- (i) Discuss the effect of load factor on the cost of generation in a power system.
- (j) Define diversity factor and demand factor.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 (a) What are the functions of economizer, superheater and airpreheater?
 - (b) A thermal plant spends Rs. 25 lakhs in one year as coal consumption. The coal has heating value of 5000 kcal/kg and costs Rs. 600 per ton. If the thermal efficiency is 35% and electrical efficiency is 90%, find the average load on the power plant.

OR

3 Draw schematic layout of thermal power station. Explain briefly four main circuits of the plant.

UNIT – II

- 4 (a) Explain the working of Fast Breeder reactor.
 - (b) Discuss the main parts of a reactor and their functions.

OR

- 5 (a) Classify water turbines and describe them briefly.
 - (b) A river has a discharge of 500 lit/sec and the available head is 100 mt. Will it be advisable to use a Pelton wheel running at 500 rpm? Assume machine efficiency to be 90%.

UNIT – III

- 6 (a) What is the principle of solar photovoltaic power generation?
 - (b) Explain the different characteristics of PV system.

OR

- 7 (a) Explain briefly about the horizontal wind mills with neat sketch.
 - (b) Distinguish clearly between: (i) Constant speed constant frequency WTG unit. (ii) Variable speed constant frequency WTG system.

UNIT – IV

- 8 (a) Explain energy storage using flywheels.
 - (b) Explain how ocean tides are generated and low the power can be tapped.

OR

- 9 (a) Describe the different types of turbines in use for small scale hydroelectric power plants.
- (b) What are the advantages and limitations of small scale hydroelectric power?

UNIT – V

- 10 (a) Explain two-part tariff and maximum demand tariff.
 - (b) A generating station supplied the following loads: 150 MW, 120 MW, 85 MW, 60 MW and 5 MW. The station has a maximum demand of 220 MW. The annual load factor of the station is 48%. Calculate:
 (i) The number of units supplied annually. (ii) Diversity factor. (iii) Demand factor.

OR

- 11 (a) Enumerate and explain briefly various methods used to calculate the depreciation cost.
 - (b) The output of a generating station is 500 x 10⁶ kWh per year and average load factor is 0.7. If the annual fixed charges are Rs. 50 per kW of installed plant and annual running charges are 5 per kWh, what is the cost per kWh of energy at the busbar.