

[06 - 3220]

III/IV B.E. DEGREE EXAMINATION.

Second Semester

Electrical and Electronics Engineering

ELECTRICAL POWER GENERATION AND
UTILIZATION

(Effective from the admitted batch of 2006-2007)

Time : Three hours

Maximum : 70 marks

First question is compulsory.

Answer any FOUR from the remaining.

All questions carry equal marks.

1. (a) If energy produced during 24 hours is 38,750 kWh and the maximum demand and installed capacity are 2500 and 3500 kW respectively, calculate the load factor and plant capacity factor.
- (b) (i) Distinguish between peak load and base load type hydropower plants.
(ii) What is water hammer?
- (c) What are the advantages of MHD system of power generation over conventional methods of power generation?

- (i) The fixed charges are Rs. 80/ per kVA of the maximum demand of the consumer.
 - (ii) The fixed charges are 5 paise per unit consumed.
7. (a) Describe the construction and explain the principle of operation of florescent lamp with circuit diagram.
- (b) What is POLAR curve? State its application.
- (c) Four lamps each giving 200 C.P. uniformly below the horizontal plane are suspended 9 meters above the ground at the corners of a square 12 meters side. Calculate the illumination.
- (i) Directly under each lamp and
 - (ii) At the centre of the ground.
8. (a) State the advantages of resistance welding.
- (b) Explain briefly the different methods of electric arc welding.
- (c) Determine the amount of energy required to melt brass at the rate of one tonne per hour in a single phase Ajax-Wyatt furnace.
- Specific heat of brass = 0.094; Initial Temperature 24°C; Latent heat of fusion is 40 k.cal/kg and melting point of brass 920°C. Assume the efficiency to be 65%.

- (d) Give the layout of gas turbine plant and its advantages.
 - (e) Differentiate between open cycle MHD and closed cycle MHD system.
 - (f) State and explain the laws of illumination.
 - (g) What is the fundamental difference between electric arc welding and resistance welding?
- 2.
- (a) Sketch the layout of a modern steam power plant and explain each part therein.
 - (b) What is a condenser? Describe the operation of:
 - (i) Surface condenser and
 - (ii) Jet condenser with neat diagrams.
- 3.
- (a) On what factors does the choice of a site depend for a nuclear power plant?
 - (b) Explain the terms: Fission, chain reaction and fast breeder reactor.
 - (c) Explain the basic principle of operation of MHD power generation. What are the limitations of MHD generation?

4. (a) What are the various types of turbines used in a hydel station and compare each of them with others?
- (b) Explain the combined cycle operation of gas turbine plant.
- (c) What are the advantages of a gas power plant over steam plant?
5. (a) Explain the different tariff systems in use. What are their relative merits and demerits?
- (b) Explain how the size and number of generator units are decided in a generating station that is to be built.
- (c) Explain the method of constructing a load duration curve using a load curve.
6. (a) Define :
- (i) Demand factor
 - (ii) Load factor
 - (iii) Diversity factor
 - (iv) Load curve and
 - (v) Load duration curve.
- (b) What will be the annual bill of a consumer whose load factor is 70% and has total load of 400 kW at 0.8 power factor. The following is the two-part tariff of the supply system to which the consumer is connected.