B.E. Electrical (Electronics & Power) Engineering Seven Semester

EP703 - Electrical Energy Utilization

P. Pages : 2 **GUG/W/18/1775**

Time : Three Hours * 1 3 8 7 * Max. Marks : 80

Notes : 1. All questions carry equal marks.
2. Answer **five** questions in all. As per internal choices mentioned.
3. Assume suitable data wherever necessary.
4. Illustrate your answers wherever necessary with the help of neat sketches.
5. Use of Non-programmable calculator is permitted.

1. a) Explain the role of mechanical load and load torque in selection of drives. **4**

b) D.C. drives are one of the better choices in industries than a.c. drives, justify the answer in brief. **6**

c) Differentiate the salient properties of shunt and separately excited motors in drive selection. **6**

OR

2. a) Compare the total annual cost of a group drive with a motor costing Rs. 18000 with that of ten individual motors, each costing Rs. 5000. With group drive annual electrical energy consumption is 80000 kWh. With separate drives the annual consumption is 55000 kWh, Electrical energy costs 20 Paise per kWh. Depreciation, maintenance and other fixed charges amount to 10% in case of group drive and 15% in case of individual drive. **10**

b) Explain the methods of d.c. motor speed control using thyristor. **6**

3. a) State the importance and advantages of electric heating over thermal heating and explain each modes of heat transfer in detail. **8**

b) Explain any one method of electric heating in detail with a neat diagram. **8**

OR

4. a) Classify Arc Furnaces and explain any one in detail with a neat diagram. **6**

b) Write brief with neat diagram on **any two.** **10**

1) Resistance Heating.

2) Induction Heating.

3) Arc Heating.

5. a) Discuss the important factors required for the length of the arc in electric arc welding. **8**

b) Explain the importance of resistance electric welding with its merits and demerits in detail. **8**

OR

6. a) Classify electric arc welding and explain any one in detail with neat diagram. **6**

b) Write brief note on **any two.** **10**

1) Butt welding.

2) Flash welding.

3) Spot welding and

4) Projection welding.

7. a) Explain the nature of light and the relation between human eye sensitivity & visibility spectrum? **8**

b) Explain and state **any one.** **8**

1) Inverse Square Law,

2) Lambert's Cosine Law.

OR

8. a) A lamp has a total flux of 1500 lumens and takes a current of 0.4 A. Calculate: Lumens per watt and M.S.C.P. per watt. 250 V lamp. **8**

b) Compare fluorescent tube and incandescent lamp including components used in. **8**

9. a) What are the different track electrification systems presently available in India? **8**

b) Compare pure AC and DC Traction Systems. **8**

OR

10. a) Explain the different components of speed – time curves for train movement in detail. **6**

b) A suburban train runs with an average speed of 36 kmph between two stations. 1.8 km apart. Values of acceleration and retardation are 1.8 km/h/s and 3.6 km/h/s respectively. Calculate the maximum speed of the train assuming trapezoidal speed – time curve. **10**

****