B.E. (Electrical Engineering (Electronics & Power)) Fifth Semester (C.B.S.)

Utilization of Electric Energy

P. Pages : 2 **NRT/KS/19/3419**

Time : Three Hours *0128* Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Diagrams and chemical equations should be given whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.

1. a) What are the desired properties of heating element material? **6**

b) The power required for dielectric heating of slab of resin 200 cm ^{2} in area and 2 cm thick is 200 W, frequency of 30 MHz, Material has relative permittivity of 5 and p.f. of 0.05 Determine voltage necessary and current flowing through the material. If the voltage is limited to 600V. What will be the value of frequency to obtain the same heating? **7**

OR

2. a) Explain design procedure of heating element when the voltage and electrical energy input is known. **6**

b) Describe the construction and operation of an electric are furnace. **7**

3. a) Describe with neat sketch the process of ultrasonic welding. Also mention its application. **7**

b) Explain the following: **6**

i) Submerged are welding ii) Projection welding.

OR

4. a) What are the requirement of good weld? State advantages of using coated electrodes. **6**

b) Explain Electric Resistance welding in detail with neat sketch. **7**

5. a) Define:

i) Polar curves **2**

ii) Luminous Intensity **2**

iii) Utilization factor **2**

b) The hall of 30x20 sq-m area is to be provided with an average illumination of 200 lux. The lamps are to be fitted 4 m from ground floor. Find the number of lamps and wattage/lamp for the lighting scheme. Efficiency of the lamps available is 25 lumens/watt, depreciation factor is 0.8 and co-efficient of utilization is 0.75. Give satisfactory spacing arrangement. **8**

OR

6. a) Discuss various factors to be considered while designing lighting scheme. **7**

b) State & Explain Laws of Illumination. **7**

7. a) Describe with neat sketch vapour absorption refrigeration system. Compare it with vapour compression system. **7**

b) Describe complete arrangement of centrally air conditioning plant. **6**

OR

8. a) Explain main requirement of good refrigerant. Explain primary and secondary refrigerant. Name the refrigerant generally used. **7**

b) Explain the factors on which air conditioning depends. **6**

9. a) Explain in detail various air flow control strategies of fan. **7**

b) What are the different types of pump curves? Explain any two of them in detail. **7**

OR

10. a) List the energy saving opportunities in a pumping system. **7**

b) How do you assess the performance of fan. **7**

11. a) What are the various operational factors in D.G. set? **6**

b) What is compressor? Give classification of compressors. **7**

OR

12. a) Define and Explain: **6**

i) Compressor efficiency

ii) Compressed air system.

b) Explain the principle of four stroke diesel engine. **4**

c) List energy saving opportunities in an industrial DG set plant. **3**

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