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

Utilization of Electric Energy

P. Pages : 2

Time : Three Hours

0012

Max. Marks : 80

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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. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.

1. a) Give the classification of various electric heating methods and explain it in brief. **7**

 b) The power required for dielectric heating of a slab of resin $200\,\text{cm}^2$ in area and 2cm thick is 200W, frequency of 30MHz. Material has relative permitivity of 5 and pf of 0.05. Determine the 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. **6**

OR

2. a) Derive the mathematical expression used for design of circular and rectangular heating element. **6**

 b) Describe the construction and operation of Ajax wyatt furnace. **7**

3. a) Explain with neat sketch Electric arc welding in detail. **8**

 b) Explain with neat sketch spot welding and projection welding. **6**

OR

4. a) Describe with neat sketch the process of ultrasonic welding. Also mention its applications. **6**

 b) Explain advantages of electric welding compare between flash butt welding and upset butt welding. **8**

5. a) Define and explain the following terms. **6**

 i) Illumination.   ii) Polar Curves.   iii) Utilisation factor.

 b) An illumination on the working plane of 75 lux is required in a room 72m✕15m in size. The lamps are required to be hung 4m above the work bench. Take a suitable space height ratio of 0.9 to unity, a utilisation factor of 0.5, a lamp efficiency of 14 lumens/watt and a candle power depreciation of 20%. Estimate the number, rating and disposition of lamps. **7**

OR

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6.	a)	Explain the different types of lighting schemes.	**6**
	b)	The front of a building measuring 60m✗15m is to be flood lighted by projectors placed at a distance of 8m from the wall. The average illumination required is 50 lux. Determine the no. and size of projectors required. Assume waste light factor of 1.2, depreciation factor of 0.8 and co-efficient of utilization 0.5. Take a lamp of 500w, with lumen output of 9000.	**7**
7.	a)	Describe with neat sketch vapour compression refrigeration system.	**7**
	b)	Describe with neat sketch the working of drinking water cooler.	**6**

OR

8.	a)	Discuss various factors involved in air conditioning and also explain comfort air conditioning.	**7**
	b)	Explain in detail about central air conditioning.	**6**
9.	a)	Explain detail the energy saving opportunities in fans.	**7**
	b)	Explain in detail the various air flow control strategies of fans.	**7**

OR

10.	a)	What is reciprocating pump. Enlist the classification of reciprocating pump.	**7**
	b)	List and explain the factors affecting pump performance.	**7**
11.	a)	Explain various compressed air system components.	**7**
	b)	Define different compressor efficiencies.	**6**

OR

12.	a)	Explain the principle of a four stroke diesel engine.	**6**
	b)	Describe the factors affecting energy performance assessment of DG set.	**7**

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