

# FACULTY OF ENGINEERING

B.E. 4/4 (E&EE) II – Semester (Make-up) Examination, August 2012

Subject: **Utilization**

Time: 3 Hours

Max. Marks: 75

**Note:** Answer all questions from Part – A. Answer any five questions from Part – B.

## PART – A (25 Marks)

1. Why coated electrodes are preferred for welding. 3
2. What are the different modes of heat transfer? 2
3. Write short notes on starting of synchronous motor. 3
4. What are the applications of float switches? 3
5. Why is tungsten selected as the filament material? 2
6. Define luminance and candle power. 2
7. What is meant by adhesive weight? 2
8. What are the advantages of electric traction over other form? 3
9. Explain suitability of 3-phase induction motor for traction work. 2
10. Name various parts in lead acid batteries. 3

## PART – B (5x10 = 50 Marks)

11. Describe with neat sketches the various methods of electric resistance welding. Give its merits and demerits with respect to arc welding.
12. Explain the following with neat schematic diagram.
  - (a) Direct reversing of 3-phase induction motor
  - (b) Two supply sources for 3-phase induction motor.
- 13.(a) Explain sodium vapour lamp with neat sketch.  
(b) Two 220 V lamps, one of 60 W and other 75 W are connected in serial across a 440 V supply, calculate the potential difference across each lamp, neglecting any variation in resistance.  
Assuming the candle power to be proportional to the fourth power of the voltage, calculate the candle power of each lamp under this condition as a percentage of its value under normal operation at 220 V.
14. Explain charging and rating of batteries, also explain maintenance of lead acid batteries.
15. A train weighing 200 tonnes in accelerated uniformly from rest to speed of 45 Km/hr up a uniform gradient of 1 in 500, in 30 sec. The power is then cut off and the train then costs down a uniform gradient of 1 in 1000 for a period of 40 secs, when the brakes are applied the train comes uniformly to rest in 15 sec. Calculate the maximum power output of the driving motor assuming an efficiency of 60%.
16. In a 3-phase arc furnace to melt 10 tonne steel in 2 hours, estimate the average input to the furnace, if overall efficiency is 50%. If the current input is 9000 A with the above KW input and the resistance and reactance of furnace leads (including transformer) are  $0.003\Omega$  and  $0.005\Omega$  respectively, estimate the arc voltage and total KVA taken from the supply.
17. Write short notes on the following: