Student Exam No:-_____

GANPAT UNIVERSITY
B.TECH SEM-VI (ELECTRICAL)
REGULAR EXAMINATION MAY-JUNE 2014
2EE614: ELECTRICALPOWER UTILIZATION & TRACTION

Time: 3 Hours **Total Marks:-70**

Instructions: - 1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

SECTION-I

Q:1 (A) Explain the working principle of arc furnaces and describe with the help of a sketch the construction and working of any one type of arc furnace (6)

(B) A Resistance oven employing nichrome wire is to be operated from 220V single phase supply and is to be rated at 16kW. If the temperature of the element is to be limited to 1170°C and average temperature of charge is 500°C find the diameter and length of the element wire. Assume emissivity=0.9 and radiating efficiency=0.57 Specific resistance of nichrome=$109\times10^{-8}\Omega m$ (6)

OR

Q:1 (A) Explain different methods of induction heating. Give some applications of induction heating. (6)

(B) A 20KW ,230V single phase resistance oven employs chrome wire fot its heating elements. If the wire temperature is not to exceed 1200℃ and the temperature of the charge is to be 600℃, calculate the diameter and the length of the wire. Regarding Efficiency =0.6 and resistivity of nickel chrome =101.6×10-8Ωm (6)

Q:2 (A) Discuss the principle of arc welding and the difference between carbon and metallic arc welding and their relative merits. (6)

(B) Write Short Note on flash welding (5)

OR

Q:2 (A) With neat sketches explain MIG welding process (6)

(B) Compare A.C. and D.C. welding. (5)

Q:3 (A) Write short note on Plasma arc welding process (4)

(B) State and explain faraday's law of electrolysis (4)

(C) State different Transition methods and explain any one. (4)

SECTION-II

Q:4 (A) What are the requirements of Ideal traction system? and what are the advantages and disadvantages of Electrical traction? (6)

(B) Draw and explain speed-time for main-line service, urban and Sub-urban service. (6)

OR

Q:4 (A) Explain construction and working of Fluorescent lamp with neat sketch. (6)

(B) A room size of 15 x 10 meters is to be illuminated by twenty 200W lamps. The mscp of each lamp is 250. Assume a depreciation factor 1.2 and Utilization factor 0.6. Find average illumination produced on floor. (6)

Q:5 (A) Derive expression for overall starting efficiency of Rheostatic starting. (6)

(B) Explain regenerative braking. (5)

OR

Q:5 (A) Two 600v motor each having a resistance of 0.1 ohm are started on the series-parallel system, the mean current per motor throughout the starting period being 250 A. the starting period is 15 seconds and the train speed at the end of this period is 30 km per hour. Calculate (1) the Rheostatic losses (in Kwh) during (a) the series and (b) the parallel combustions of motor (2) the train speed at which transition from series to parallel must be made. (6)

(B) Write a Short note on Electro plating. (5)

Q:6 (A) What do you mean by electro deposition? Explain factors affecting the process of electro deposition. (6)

(B) Briefly explain various track electrification systems (6)

END OF PAPER

Best of Luck