

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE SEM-V Examination-Nov/Dec.-2011**

**Subject code: 150203**

**Date: 26/11/2011**

**Subject Name: Power Electronics and Control Engineering**

**Time: 2.30 pm -5.00 pm**

**Total marks: 70**

**Instructions:**

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

- Q.1** (a) 1) Write the differences between SCR & transistor. **03**  
2) Describe the different modes of operation of thyristor with the help of its V-I characteristics. **04**  
(b) Explain construction & characteristics of UJT with neat diagram. **07**

- Q.2** (a) Explain different methods of triggering a SCR. Which method is normally used & why? **07**  
(b) For an UJT with  $V_{BB}=20V$ ,  $\eta=0.65$ ,  $R_{B1}=2K\Omega$  &  $V_d=0.7V$  determine  $R_{B2}$ ,  $R_{BB}$ ,  $V_{RB1}$ , &  $V_p$  **07**

**OR**

- (b) Explain with diagram construction & operation of Ignitron (Mercury pool tube). Where it is used? **07**

- Q.3** (a) Explain all bits of flag register of 8085. Explain when they are set/reset? **07**  
(b) Draw & explain torque-speed characteristics of DC motor. Show how SCRs can be used to control the speed of DC motor above/below rated speed. **07**

**OR**

- Q.3** (a) Draw the circuit diagram of single phase fully controlled bridge rectifier with resistive load & derive the expression for average load voltage, average load current & RMS load voltage. **07**  
(b) Explain with diagram important components of resistance welding system. What are the advantages of resistance welding over other type of welding? **07**

- Q.4** (a) Draw the circuit diagram of ignitron contactor & explain its working. Where it is used? **07**  
(b) What is supply frequency for a case of hardening of a shaft having specific resistivity  $5 \times 10^{-5} \Omega\text{-cm}$  and the relative permeability equal to 1 for depth of penetration 2mm. **07**

**OR**

- Q.4** (a) Write main features of 8085 microprocessor & explain its programming registers model. **07**

- Q.4** (b) Explain the principle of dielectric heating & derive the expression power dissipation per unit volume. **07**

- Q.5** (a) Explain the following instruction of 8085 with example- 1)MVI 2) LDA 3) STA 4) RAR 5) JNC 6) HLT 7) CMA **07**

- (b) Write assembly language program to store data 35h & 4Ah in memory location 4280h and 4281h respectively. Add them & store the result in memory location 4282h. **07**

**OR**

- Q.5** (a) Explain binary weighted resistor type of digital to analog converter with diagram. **07**
- (b) Write assembly language program to add five numbers in memory array starting from 452Ah to 452Eh & store the result in location 452Fh. **07**

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