

(3 Hours)

[Total Marks : 80]

- N.B: (1) Question no. 1 is compulsory  
 (2) Solve any **three** from remaining questions  
 (3) Assume **suitable** data if necessary  
 (4) **Figures** to the right indicate full marks

1. Solve any 4: 20
  - (a) State and prove DeMorgan's theorem.
  - (b) Draw the characteristics of power BJT, power MOSFET and IGBT.
  - (c) Mention the importance of Instrumentation amplifier and Voltage Follower.
  - (d) Compare A.C and D.C motors.
  - (e) Explain basic principle of single phase inverter.
  
2. (a) Draw and explain block diagram of closed loop speed control of DC motor. 7  
 (b) Write a short note on selection of motors for various industrial applications. 7  
 (c) Compare SCR and TRIAC. 6
  
3. (a) With neat circuit diagram and waveforms, explain single phase full wave half controlled rectifier circuit supplying a resistive load. 7  
 (b) Draw and explain architecture of MSP430 microcontroller 7  
 (c) Describe in detail Low Pass filter. 6
  
4. (a) Draw circuit diagram and waveform of 3 phase bridge inverter with R load (180 degree mode of conduction) 7  
 (b) Explain the working principle of a GTO with proper diagram. 7  
 (c) Compare Monostable and Astable multivibrators. 6
  
5. (a) Explain UJT triggering method of SCR. 7  
 (b) What is a flip flop? Explain the different types of flip flops. 7  
 (c) Compare microprocessor and microcontroller. 6
  
6. (a) Explain the application of microcontroller in Piezoelectric Actuator Drive. 7  
 (b) Explain any one method for the speed control of A.C induction motors. 7  
 (c) Write a short note on Multiplexer and Demultiplexer. 6

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