

Duration: 3hrs

[Max Marks: 80]

- N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

- 1** Attempt any FOUR
- a** Write note on speed control of 3 phase induction motor. [05]
 - b** What is the necessity of inner current loop control circuit for speed control of DC motor [05]
 - c** Draw and explain Architecture of generic microprocessor. [05]
 - d** Explain Astable Multi-vibrator using IC 555. [05]
 - e** State and prove Demorgan's theorems. [05]
- 2**
- a** With neat circuit diagram and waveforms, explain single phase full wave half controlled rectifier circuit supplying a resistive load [10]
 - b** Compare SCR, Triac, Power BJT, Power MOSFET and IGBT. [10]
- 3**
- a** State and describe IGBT on the basis of construction, principles of operation, applications, rating, input and output characteristics. [10]
 - b** Realize basic digital gates using NOR and NAND universal gates. [10]
- 4**
- a** Explain with the help of a neat circuit diagram how diac can be used to trigger a triac. What are the applications of this circuit? [10]
 - b** What are similarities and dissimilarities of microprocessor and micro-controller ? [10]
- 5**
- a** Draw and explain torque-speed characteristics of Induction motor. State various methods of speed control of Induction motor. [10]
 - b** With neat circuit diagram and waveforms, explain 180° mode of conduction for a three phase bridge inverter circuit. [10]
- 6**
- a** What are inverting and non-inverting amplifiers? Write their gain equations. Draw the circuit diagram for OPAMP as summing amplifier and also write its output voltage equation. [10]
 - b** Draw and explain functional diagram of MSP430 micro-controller. [10]
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