(3 Hours)   **[Total 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   **[20]**

     a Compare between SCR and DIAC

     b Draw and Explain low pass filter

     c What is an operational amplifier? Explain its characteristics

     d Differentiate between microprocessor and microcontroller

     e State and prove De-Morgan's theorems

2 a. Explain 180 degree mode of operation of inverter   **[10]**

     b. Explain the architecture of MSP 430 microcontroller   **[10]**

3 a. Draw the circuit diagram of astable multivibrator and explain its operation.   **[10]**

     b. Define and Explain specification parameter of digital logic family.   **[10]**

4 a. Explain the working principle of single phase bridge inverter circuit.   **[10]**

     b. List various speed control methods of induction motor. Explain voltage control
        method with a suitable diagram.   **[10]**

5 a. What is a 555 timer? Write its applications and explain astable multivibrator with
       associated circuit diagram and waveforms.   **[10]**

     b. Write difference between assembly programming and C programming also write the
        applications of microcontroller as Speed Measurement using Proximity Sensor. **[10]**

6 a. Write a note on   a) BLDC Motor   b) Servo Motor   **[10]**

     b. Draw and explain the working of multiplexer and de-multiplexer.   **[10]**

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