Instructions:
Total Time: **3 Hrs**   Total Marks: **80**

1. Question No: **1** is **compulsory**.
2. Answer any **three** from the **remaining five** questions.
3. Figures to the right indicate full marks.

1   Solve **any four**:-   (20)
  a)   Draw application circuit of triac-diac and associated waveforms.
  b)   Enlist applications of inverter?
  c)   Draw buffer, integrator and Schmitt trigger circuit.
  d)   Define and describe logic operation, power dissipation and propagation delay in digital circuits.
  e)   Draw and explain generic microcontroller.

2   a)   Describe speed torque characteristics of dc and ac motors.   (07)
  b)   Explain three phase inverter operation with waveforms.   (07)
  c)   Describe in detail instrumentation amplifier. State its need and   (06)
        applications.

3   a)   Explain an ac to dc converter supplying resistive load. Derive equation for (07)
        calculating dc voltage.
  b)   Explain procedure to select a motor for an application and describe with   (07)
        the speed torque characteristics.
  c)   Explain in detail low pass active filter   (06)

4   a)   Explain need of digital to analogue conversion. How the ADC in MSP430   (07)
        works?
  b)   Compare analogue and digital circuits. Enlist some of them.   (07)
  c)   Describe closed loop speed control of DC motor.   (06)

5   a)   Draw and explain architecture MSP 430 microcontroller?   (07)
  b)   What is MOSFET? Explain its working. What are similarities between   (07)
        MOSFET and IGBT?
  c)   Explain IC 555 timer as Monostable Multivibrator.   (06)

6   a)   Explain with circuit diagram any forced commutation method of SCR.   (07)
  b)   Compare microprocessor and microcontroller.   (07)
  c)   Explain Demultiplexer and Decoder.   (06)