

**N. B.**

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) State firing methods of SCR.
  - b) How bridge inverter circuit works?
  - c) Explain the operation of inverting adder circuit.
  - d) State advantages of analogue circuits.
  - e) Give applications of different motors with justification
- 2**
- a) State and describe power Diode on the basis of construction, principles of operation and characteristics (07)
  - b) What is MOSFET? Explain its working. What are similarities between MOSFET and IGBT? (07)
  - c) Derive the output voltage for full wave bridge rectifier with R-load (06)
- 3**
- a) Discuss speed torque characteristics of induction motor? (07)
  - b) Describe closed loop speed control of DC motor using block diagram (07)
  - c) Explain in detail the concept of R-L-E load in converters (06)
- 4**
- a) What are difference between digital and analogue circuits? (07)
  - b) How SCR commutation circuit work? (07)
  - c) Explain in detail first order low pass active filter (06)
- 5**
- a) Describe the functional block diagram and architecture MSP430 microcontroller? (07)
  - b) Explain different flip-flop circuits and compare TTL and CMOS IC technologies. (07)
  - c) Compare Microprocessor and Microcontroller (06)
- 6**
- a) Explain how to select a motor for any application and describe with the speed torque characteristics (07)
  - b) Explain different servo applications. (07)
  - c) Show interfacing of external input and output devices and MSP 430 (06)