

Duration – 3 Hours

Marks - 80

**N.B.:** - (1) Question No.1 is compulsory.

(2) Attempt any Three questions out of remaining five questions.

(3) Assume suitable data if necessary and justify the same.

- Q 1. Answer **all** questions.
- A) What are any four parameters used to select a semiconductor device? **04**
  - B) Derive the output equation of Full wave controlled rectifier using SCR. **04**
  - C) Explain the working of Voltage follower or Buffer using OPAMP. **04**
  - D) Describe Set Reset(SR) and Trigger(T) flip flop. **04**
  - E) Explain with block diagram the role of microcontroller in an industrial application **04**
- Q 2 a) Explain any one power electronic switch using construction, working principles and applications. **07**
- Q 2 b) Draw and explain advantages of closed loop speed control over open loop method of speed control in dc motor. **07**
- Q 2 c) Draw VI characteristic of Diac and explain all modes of operation. **06**
- Q 3 a) Identify and describe working of rectifier and inverter used in ac motor speed control. **07**
- Q 3 b) What are similarities and difference between SCR and GTO? **07**
- Q 3 c) Describe with circuit diagram the working OPAMP as an inverting amplifier and non-inverting amplifier **06**
- Q 4 a) Develop circuit using OPAMP for any one industrial application. **07**
- Q 4 b) Explain construction and working of IC555 timer. **07**
- Q 4 b) Compare TTL and CMOS logic families. **06**
- Q 5 a) Enlist any four digital circuits used for industrial applications and explain working of any one digital circuit. **07**
- Q 5 b) Compare active and passive filters. **07**
- Q 5 c) Explain in detail temperature measurement using MSP 430 microcontroller. **06**
- Q 6 a) Explain with block diagram the basic functioning of MSP 430 microcontroller. **07**
- Q 6 b) Draw and describe the working principle of Servo Motor. **07**
- Q 6 c) Explain with an application the use of pumps and conveyor. **06**