



Duration –Three Hrs.

Total Marks-80

- N. B.** 1. Question No. 1 is compulsory
2. Solve any three questions out of remaining five questions
3. Figures to the right indicate full marks

- Q. 1** Attempt Any four of the followings
- A Draw and explain V-I characteristics of SCR 5
 - B Explain the need of freewheeling diode in controlled rectifier with R-L load. 5
 - C Draw and explain equivalent circuit of an OP-Amp. 5
 - D Differentiate Between Multiplexer and De-multiplexer. 5
 - E Compare between DC Motor and AC Motor. 5
- Q.2**
- A Draw and explain functional block diagram of timer IC 555. 7
 - B Draw and explain fan regulator circuit using TRIAC and DIAC. Draw Waveforms. 7
 - C State and prove Demorgan's theorems in Boolean Algebra. 6
- Q.3**
- A Draw and explain semi-controlled rectifier. Draw waveforms. 7
 - B Draw and explain MSP430 architecture. 7
 - C Draw and explain Instrumentation amplifier State its advantages and disadvantages. 6
- Q.4**
- A Draw and explain BLDC motor. State its advantages. 7
 - B State and Define specification parameters of Digital logic family. 7
 - C Explain construction and characteristics of Power BJT 6
- Q.5**
- A With the help of connection diagram, derive the relation for voltage gain in inverting mode of operation of operational amplifier. 7
 - B With the help of circuit diagram and waveforms, explain the generation of output voltage in three phase inverter in 180° conduction mode of operation. 7
 - C What do you understand by servo motor. State its applications. 6
- Q.6**
- A Draw and explain slip-torque characteristics of three phase AC motor. 7
 - B Draw and explain CMOS NAND gate with the help of truth table. 7
 - C Differentiate between microprocessor and Microcontroller. 6
