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 180^0 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**

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