University of Mumbai
Examinations Summer 2022

Time: 2 hour 30 minutes   Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which one is the most suitable power device for high frequency (>100 kHz) switching application?
Option A:	BJT
Option B:	Schottkey diode
Option C:	Microwave transistor
Option D:	Power MOSFET
2.	The closed loop speed control of DC motors is obtained by ,,,,,,,,
Option A:	field control with the armature voltage Increased near the rated value
Option B:	field control with the armature voltage maintained near the rated value
Option C:	field control with the armature voltage decreased near the rated value
Option D:	None of the above
3.	In an OP-AMP Inverting Amplifier circuit, the output voltage v_o is expressed as a function of _____
Option A:	Source voltage
Option B:	Input current
Option C:	Source current
Option D:	Input current
4.	In S-R flip-flop, if Q = 0 the output is said to be _____
Option A:	Set
Option B:	Reset
Option C:	Previous state
Option D:	Current state
5.	What is the maximum operating frequency of MSP430
Option A:	50 MHz
Option B:	12 MHz
Option C:	25 MHz
Option D:	10 MHz
6.	In BLDC motor field winding is kept on
Option A:	Stator
Option B:	Rotor
Option C:	Can be Rotor or Stator
Option D:	No field winding on Rotor or Stator
7.	An SCR is turned off when ....
Option A:	Anode current is reduced to zero
Option B:	Gate voltage is reduced to zero
Option C:	Gate is reverse biased
Option D:	None of the above
8.	If single phase full bridge voltage source square wave inverter is feeding a pure inductive load, then nature of current waveform will be

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Option A:	Trapezoidal
Option B:	Triangular
Option C:	Rectangular
Option D:	Sinusoidal
9.	In case of controlled rectifiers, the nature of the load current (continues or discontinuous) depends upon the
Option A:	Type of load and firing angle
Option B:	only on the type of load
Option C:	only on the firing angle
Option D:	it is independent of all the parameters
10.	What does a microprocessor understand after decoding opcode?
Option A:	Perform ALU operation
Option B:	Go to memory
Option C:	Length of the instruction and number of operations
Option D:	Go to the output device

Q2. (20 Marks)	
A	**Solve any Two** **5 marks each**
i.	Write short note on IGBT
ii.	Compare AC and DC motor
iii.	With the help of neat block diagram explain working of IC -555 timer
B	**Solve any One** **10 marks each**
i.	Classify and explain any one triggering methods of SCR with circuit diagram
ii.	Draw and Explain Architecture of MSP430.

Q3. (20 Marks)	
A	**Solve any Two** **5 marks each**
i.	Explain De-Morgan's Theorem
ii.	Compare DIAC and TRIAC.
iii.	What are dissimilarities of microprocessor and Microcontroller?
B	**Solve any One** **10 marks each**
i.	Draw and explain single phase fully controlled bridge rectifier with R-load.
ii.	Draw and Explain V-I characteristics of Zener diode

Q4. (20 Marks)	
A	**Solve any Two** **5 marks each**
i.	Explain In detail Instrumentation amplifier using OP-AMP.
ii.	Write selection criteria of motors for industrial application.
iii.	Compare CMOS and TTL logic families.
B	**Solve any One** **10 marks each**
i.	Write different applications of Microcontroller. Explain any one application in detail?
ii.	Explain the principle of the Three-Phase bridge Inverter