Roll. No: NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA (An Autonomous Institute Affiliated to AKTU, Lucknow) **B.Tech SEM: III - THEORY EXAMINATION (2024 - 2025)** Subject: Logic Design and Microcontroller **Time: 3 Hours** Max. Marks: 100 **General Instructions: IMP:** *Verify that you have received the question paper with the correct course, code, branch etc.* 1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice *Questions (MCQ's) & Subjective type questions.* 2. Maximum marks for each question are indicated on right -hand side of each question. 3. Illustrate your answers with neat sketches wherever necessary. 4. Assume suitable data if necessary. 5. Preferably, write the answers in sequential order.

Subject Code:- ACSIOT0302

20

1

1

1

1

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

## **SECTION-A**

**Printed Page:-03** 

1. Attempt all parts:-

One byte is equivalent to how many bits? (CO1,K3) 1-a.

- (a)
- 4 (b)
- (c) 8
- (d) 1
- What is a multiplexer? (CO1,K3) 1-b.
  - It is a type of decoder which decodes several inputs and gives one output (a)
  - A multiplexer is a device which converts many signals into one (b)
  - It takes one input and results into many output (c)
  - It is a type of encoder which decodes several inputs and gives one output (d)
- The register is a type of \_\_\_\_\_. (CO2,K4) 1-c.
  - Sequential circuit (a)
  - Combinational circuit (b)
  - CPU (c)
  - (d) Latches
- Ring shift and Johnson counters are \_\_\_\_\_. (CO2,K4) 1-d.
  - (a) Synchronous counters
  - (b) Asynchronous counters
  - (c) True binary counters

## Page 1 of 3

	(d)	Synchronous and true binary counters	
1-e.	Microprocessor consists of (CO3,K3)		1
	(a)	ALU	
	(b)	register array	
	(c)	control unit	
	(d)	All of the above	
1-f.	T	he accumulator is 16 bit wide and is called (CO3,K3)	1
	(a)	AX	
	(b)	AH	
	(c)	AL	
	(d)	DL	
1-g.	When an interrupt is enabled, then where does the pointer moves immediately after this interrupt has occurred? (CO4,K1)		1
	(a)	to the next instruction which is to be executed	
	(b)	to the first instruction of ISR	
	(c)	to a fixed location in memory called interrupt vector table	
	(d)	to the end of the program	
1-h.	Calculate the address line required to interface 4KB of external memory. (CO4,K1)		1
	(a)	10	
	(b)	11	
	(c)	12	
	(d)	13	
1 <b>-i</b> .	W	hich of the following interrupt is having highest priority? (CO5,K3)	1
	(a)	EXTIO	
	(b)	EXTI1	
	(c)	Timer 0	
	(d)	Timer 1	
1-j.	V	ector address for Serial Interrupt is (CO5,K3)	1
	(a)	000BH	
	(b)	0013H	
	(c)	001BH	
	(d)	0023H	
2. Atte	empt a	all parts:-	
2.a.	W	That are the universal logic gates? (CO1,K3)	2
2.b.	W	That do you mean by sequential circuits? (CO2,K4)	2
2.c.	W	That is a Microprocessor? (CO3,K3)	2
2.d.	N	ame the interrupts available in microcontroller 8051. (CO4,K1)	2

## Page 2 of 3

•

2.e.	What is sensor? (CO5,K3)	2
<b>SECTIO</b>	<u>N-B</u>	30
3. Answe	r any <u>five</u> of the following:-	
3-a.	What is Full adder? Explain with truth table and circuit diagram. (CO1,K3)	6
3-b.	Draw the logic diagram for 4:1 Multiplexer and explain 16:1 multiplexer. (CO1,K3)	6
3-c.	Differentiate between latches & flip flops. (CO2,K4)	6
3-d.	Explain ripple counter. (CO2,K4)	6
3.e.	Explain 8085 register in detail. (CO3,K3)	6
3.f.	Explain the different jump instruction in 8051. (CO4,K1)	6
3.g.	Explain TCON register in 8051 Microcontroller. (CO5,K3)	6
<b>SECTIO</b>	<u>N-C</u>	50
4. Answe	r any <u>one</u> of the following:-	
4-a.	Design 32:1 MUX using 2:1 MUX. (CO1,K3)	10
4-b.	Design and explain priority encoder. (CO1,K3)	10
5. Answe	r any <u>one</u> of the following:-	
5-a.	Realize a JK flip flop using SR flip flop. (CO2,K4)	10
5-b.	Explain T to D and D to T conversion. (CO2,K4)	10
6. Answe	r any <u>one</u> of the following:-	
б-а.	Explain arithmetic and logical instruction of 8085 microprocessor in detail. (CO3,K3)	10
6-b.	Define addressing modes. With suitable examples explain 8085 addressing modes in detail. (CO3,K3)	10
7. Answe	r any <u>one</u> of the following:-	
7-a.	Explain the architecture of 8051 microcontroller with a neat block diagram. (CO4,K1)	10
7-b.	Explain the different addressing modes of 8051. Give an example for each one of them. (CO4,K1)	10
8. Answe	r any <u>one</u> of the following:-	
8-a.	Write a program to generate a square wave of 50 Hz frequency on pin P2.3 in 8051. (CO5,K3)	10
8-b.	Draw the diagram to interface a stepper motor with 8051 microcontroller and Write its assembly language program to run the stepper motor in forward direction with delay. (CO5,K3)	10

•