R20

B.Tech II Year I Semester (R20) Supplementary Examinations August/September 2023
DIGITAL ELECTRONICS & MICROPROCESSORS
(Common to CSE (Cyber Security), IT, CSE, CSE (AI), CSE (AI&ML), AI&DS, CSE (IoT), CSE (DS), and AI&ML)

Time: 3 hours   Max. Marks: 70

PART – A
(Compulsory Question)
*****

1	Answer the following: (10 X 02 = 20 Marks)	
(a)	Realise OR gate using NAND gates.	2M
(b)	State the limitations of K-maps.	2M
(c)	Is the PAL same as the PLA? Justify.	2M
(d)	Compare and contrast Encoder and Multiplexers.	2M
(e)	What is triggering? What is the need for trigger in a flip-flop?	2M
(f)	Compare asynchronous and synchronous counters.	2M
(g)	What is pipelined architecture?	2M
(h)	What is the function of D flag in 8086?	2M
(i)	Give an importance of the assembler directive EVEN.	2M
(j)	What are the flags available in 8051?	2M

PART – B
(Answer all the questions: 05 X 10 = 50 Marks)

2	(a)	Convert $(19.625)_{10}$ to binary and octal number systems.	5M
	(b)	Implement the following Boolean function with NAND gates $F(x, y, z) = \sum m(1, 2, 3, 4, 5, 7)$.	5M

OR

3	Simplify the expression using K map technique. $F = \sum m(0, 2, 4, 5, 6, 7, 8, 10, 11, 12, 14, 15)$.	10M

4	(a)	Design a half subtractor circuit.	5M
	(b)	Design and explain the working of full adder.	5M

OR

5	Design a 3 o 8 line decoder with necessary diagram.	10M
6	Design and explain the working of an up-down ripple counter.	10M

OR

7	Explain the operation of serial in parallel out shift register.	10M
8	Name and explain about the different addressing modes used in 8086 with suitable examples.	10M

OR

9	Explain the interrupts of 8086 in detail.	10M
10	Give the operation of the following 8086 instructions. (i) ADC, (ii) DEC, (iii) MUL, (iv) XOR.	10M

OR

11	Explain about the different addressing modes supported by 8051 microcontroller.	10M

*****

R20

B.Tech II Year I Semester (R20) Supplementary Examinations April/May 2024
DIGITAL ELECTRONICS & MICROPROCESSORS
(Common to CS&IT, IT, AI&DS, CSE(AI), CSE(DS), CSE(AI&ML), CSE(IoT), CSE(CS), CSE and AI&ML)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)
*****

1   Answer the following: (10 X 02 = 20 Marks)
- (a)   State De-Morgan's theorem.   2M
- (b)   Define 'Minterm' and 'Maxterm'.   2M
- (c)   State the concept of parallel binary adder.   2M
- (d)   Identify the function of select inputs of a MUX.   2M
- (e)   What is the primary drawback of an RS flip-flop, and how it overcomes using clocked RS flip-flop?   2M
- (f)   Differentiate between a JK flip-flop and a D flip-flop in terms of their functionality.   2M
- (g)   Compare Min and Max modes of 8086.   2M
- (h)   List the flags present in the 8086 processor.   2M
- (i)   What is an Assembler directive?   2M
- (j)   Define Microcontroller.   2M

PART – B
(Answer all the questions: 05 X 10 = 50 Marks)

2   Simplify the following function using five variable mapping;   10M
     F = (8, 9, 10, 11, 13, 15, 16, 18, 21, 24, 25, 26, 27, 30, 31).
OR
3   Explain the different types of codes and conversions with your own example.   10M

4   Draw and explain the working of 4 bit adder – subtractor circuit.   10M
OR
5   Implement the following function with a Multiplexer   10M
     f (a, b, c, d) = Σ (0, 1, 3, 4, 8, 9, 15).

6   Describe the operation of universal shift register with neat block diagram.   10M
OR
7   Explain the operation of a BCD ripple counter and provide a detailed explanation along with a   10M
     timing diagram to illustrate its functioning.

8   Describe the internal architecture of 8086 Microprocessor with neat diagrams.   10M
OR
9   Explain the pin diagram of 8086 Microprocessor.   10M

10   Explain the instruction set of 8086 processor with examples.   10M
OR
11   Write an ALP to compute multiplication of two 8 bit numbers and store it in memory location   10M
     using 8051 instruction set.

*****