MODEL QUESTION PAPER-I

Programme name : Computer Engineering **Semester: Three**

Course code: **Course name: Digital Computer Fundamentals**

Time : 3 Hours *Max.Marks : 75*

1. Answer all the following questions (9 x 1 = 9 Marks)

1	ASCII is the acronym for ……..	M1.04	R
2	Give an example for a non-weighted binary code	M1.04	R
3	What is the algebraic function of NAND gate output	M2.03	R
4	Write the canonical form of A+B' in SOP form	M2.05	U
5	What is Two valued Boolean algebra?	M2.01	U
6	A half adder adds.....number of bits	M3.02	R
7	What is the maximum number of unique outputs for a decoder of 4 inputs ?	M3.04	U
8	Define state table of a sequential circuit	M4.04	U
9	Show the output of a T flip flop on the next clock pulse if the input is 1 and current output is 1	M4.02	U

2. Answer any Eight questionsfrom the following 8 x 3= 24 Marks)

1	Convert the following (1) $(267.125)_8$ to $(\ldots)_{10}$ (2) $(AC9.1A)_{16}$ TO $(\ldots)_8$	M1.01	A
2	Define binary codes and list its types with example for each	M1.04	R
3	Develop an XNOR gate using NAND gates where output function of XNOR gate with two inputs A & B is $F_{(A,B)}=AB+A'B'$	M2.03	A
4	Compare minterms and maxterms	M2.05	U
5	Simplify the Boolean function F (w, x, y, z) = ∑(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14) using K-map method	M2.05	U
6	Convert the following function to the other canonical form: F(x, y, z) = ∑(1, 3, 5)	M2.02	U

7	Explain the characteristics of a multiplexer with the help of the logic diagram of a two-to-one line multiplexer	M3.04	R
8	Explain the working of a 2-to-4 line decoder	M3.04	U
9	List different types of Shift registers with logic diagrams	M4.03	R
10	Compare the behavior of synchronous and asynchronous counter	M4.04	U

3. Answer all questions from the following (6x 7 = 42 Marks)

1	Illustrate error correction using hamming code	M1.04	U
	OR		
2	Add the following BCD numbers 0001 1000 0111 + 0010 1001 0100 Justify the process	M1.05	U
3	Explain properties of basic and universal gates with suitable diagrams	M2.03	R
	OR		
4	State and explain basic theorems and postulates of two valued Boolean algebra	M2.01	R
5	Explain the working of a binary parallel adder-subtractor circuit with the help of a neat sketch	M3.03	U
	OR		
6	Explain the analysis and design procedure of a combinational circuit using Gray to binary convertor	M3.01	U
7	What is the function of a full adder. Draw the circuit diagram of a full adder using XOR and basic gates and explain the truth table.	M3.02	U
	OR		
8	What is the function of an encoder? Illustrate the function of an octal-to-binary encoder with the help of truth table	M3.04	U
9	Design a 3-bit synchronous binary counter	M4.05	A
	OR		
10	Design an asynchronous BCD counter	M4.05	A
11	Compare the working of an SR latch with NOR gates and NAND gates	M4.02	U
	OR		
12	Compare the behavior of latches and flip flops. Explain how a D-FF can be designed using D-latches.	M4.02	U

Blue Print

Mark Distribution

Module	Hours/Module (hi)	Marks/Module ($h_i/\sum H^i$) * 123 (±5%)	Type of Questions							
			Part A		Part B		Part C		Total	
			No. of questions	Marks	No. of questions	Marks	No. of questions	Marks	No. of questions	Marks
1	8	23	2	2	2	6	2	14	6	22
2	11	32	3	3	4	12	2	14	9	29
3	12	34	2	2	2	6	4	28	8	36
4	12	34	2	2	2	6	4	28	8	36
Total	43	123	9	9	10	30	12	84	31	123

Cognitive Level Distribution

Cognitive Level	Marks	% of Marks
Remembering	27	21.95
Understanding	76	61.78
Applying	20	16.26
Total	123	100