			CBCS S	GHEME		
USN	[1		18EE35
		Third Semester	r B.E. Degree Digital Syst	Examination, J tem Design	une/July 2024	4
Tin	ne: 3	hrs.			Max. N	Marks: 100
	N	ote: Answer any FIVE	full questions, cho	osing ONE full que	stion from each m	odule.
			Mod	ule-1		
1	a.	Using the K-map determines $\sum m (0, 2, 3, 5, 7, 8, 9)$	ermine the minimative $+ d.c \sum m (10, 11, 1)$	l sum of the Boole 2, 13, 14, 15).	ean function f(A,	B, C, D) = (06 Marks)
	b.	Convert the following (i) $x = A + BC + AH$	expression to its ca BC	nonical form		
	c.	ii) $f = A(B + C) (A$ Using Quine Mc Clusk	+ B + C) (ey method obtain a 12, 15)	a minimal SOP expr	ession for f(A, B,	(04 Marks) $C, D) = \sum m$
		(0, 1, 4, 5, 6, 5, 10, 11,	15, 15).	namen en e		(10 1414185)
2	a.	Using the K-map dete	rmine the minimal	sum of the Boolea	n function f(A, B,	, C, D, E) =
	b.	$\sum m (0, 4, 5, 8, 12, 13, What is a K-map? Wh$	16, 20, 21, 24, 28, 2 ich is the code use	29). d to number cells/bo	oxes, row and colu	(07 Marks) umn heading
	c.	of a K-map. Write a ne Using K-map, evaluate	at numbered 3-vari the minimal POS e	able K-map. expression of	and a second	(06 Marks)
		$f(w, x, y, z) = \pi M (0, 2)$, 3, 8, 12, 14) . d.c	πΜ (1, 4, 5, 11, 15).	G ^y	(07 Marks)
			Mod	<u>ule-2</u>	-	
3	a. b.	With a neat diagram, e. Implement full adder u	xplain the operation sing TWO 4:1 MU	n of a carry look ahe X.	ad adder circuit.	(08 Marks) (05 Marks)
	с.	Design two 2-bit magr	nitude comparator a	and implement the c	circuit with only N	AND gates. (07 Marks)
		and the second s	0	R		
4	a.	Explain the operation of	of a decimal to BCE	priority encoder.		(08 Marks)
	b. c./~	Implement full subtract Implement 16:1 MUX	tor with two half su using five numbers	btractor with extern of 4:1 MUX.	al circuit.	(05 Marks) (07 Marks)
	69		Mod	ule-3		
5	a.	Explain the working o	of master slave (M-	-S) J-K flip flop wi	th functional table	and timing
		diagram also explain he	ow race around con	dition is eliminated.		(10 Marks)
	b. с.	How an S-R flip flop is	s converted to J-K flip f	lip flop?		(04 Marks) (06 Marks)
			o 0	R		
6	a.	What is a flip flop? Exp	plain the types of fl	ip flops any three.	a	(06 Marks)
	b. с.	With the neat diagram, Explain the gated latch	in a flip-flop. Obta	in characteristic equ	ation of S-R flip-f	(08 Marks) lop. (06 Marks)
				•		(11.11.11)
		Contraction of the second seco		1 of 2		
		- J 4				
	R	and the second second				
		й.				

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(10 Marks)

Module-4

- 7 a. What are registers? Explain the four modes of operation of a shift register with suitable logic diagram. (08 Marks)
 - b. Explain working of 3-bit binary ripple counter with suitable logic and timing diagram. (06 Marks)
 - c. With logic diagram and truth table explain mod-4 ring counter. (06 Marks)

OR

- 8 a. Design mod-6 synchronous counter using S-R flip flop. Consider the count as $0 \rightarrow 2 \rightarrow 3 \rightarrow 6 \rightarrow 5 \rightarrow 1 \rightarrow 0$
 - b. Design a synchronous counter to count from 0000 to 1001 using J-K flip-flop using minimal combination gating. (10 Marks)

Module-5

- 9 a. With the neat block diagram, explain the Mealy and Moore clocked synchronous sequential circuits. (10 Marks)
 - b. Analyze the following synchronous sequential circuit to obtain input equations, excitation table and state diagram as shown in Fig.Q.9(b). (10 Marks)



OR

10 a. Explain the following: Read Only Memory (ROM) Read/Write Memory (R/W M) Flash Memory.

(12 Marks)

b. Using the 3:8 decoder of 74138, design the ROM for given truth table, explain its operation

	I/P's		O/P'S			
A_3	A ₂	A_1	D ₄	D_3	D ₂	D_1
0	0	0	0	0	0	1
0	0	1	0	1	0	1
0 ^		0	1	0	0	0
0	1	1	1	1	0	1
1	0	0	0	1	1	0
1	0	1	0	0	0	0
1	1	0	1	0	1	0
1	1	1	1	0	0	1

(08 Marks)

