

Code: 9A04401

B.Tech III Year I Semester (R09) Supplementary Examinations June 2017

SWITCHING THEORY & LOGIC DESIGN

(Mechatronics)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 A receiver with even parity hamming code receives the data 1110110. Determine the correct code.
- 2 (a) Convert the given expression into canonical SOP form;
(i) $f = AB + BC + CA$
(ii) $f = A + AB + ABC$.
(b) $F(A, B, C, D) = \bar{B}D + \bar{A}D + BD$ express them as SOP and POS forms.
- 3 Obtain minimal SOP expression for the logic function $F = \sum m(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$ using K-map and realize using NOR gates.
- 4 Design a combinational logic circuit for BCD-to-seven segment decoder.
- 5 Implement the given functions using PAL:
(i) $Y_0 = ABCD$.
(ii) $Y_1 = \bar{A}.B.\bar{C} + ABC + AC + AB\bar{C}$
(iii) $Y_2 = \bar{A}BC\bar{D} + \bar{A}BCD + ABCD$
(iv) $Y_3 = \bar{A}BC\bar{D} + \bar{A}BCD + ABCD + ABC\bar{D}$
- 6 Design a 3-bit synchronous counter.
- 7 Determine the minimal state equivalent of the state table given below using partition technique. Also determine the minimum length of sequence that distinguishes state B from state C.

PS	NS,Z	
	X=0	X=1
A	A,0	E,1
B	A,1	E,1
C	B,1	F,1
D	B,1	F,1
E	C,0	G,0
F	C,0	G,0
G	D,0	H,0
H	D,0	H,0

- 8 Obtain the ASM charts for the following state transitions:
If $X = 1$, control goes from T_1 to T_2 and then to T_3 . If $X=0$ control goes from T_1 to T_3 .
