

Katwa College
Internal Assessment – 2022

SEM-III

Sub : DIGITAL SYSTEMS AND APPLICATIONS

Paper - CC- VII

Full marks – 10

Time – 30 mins

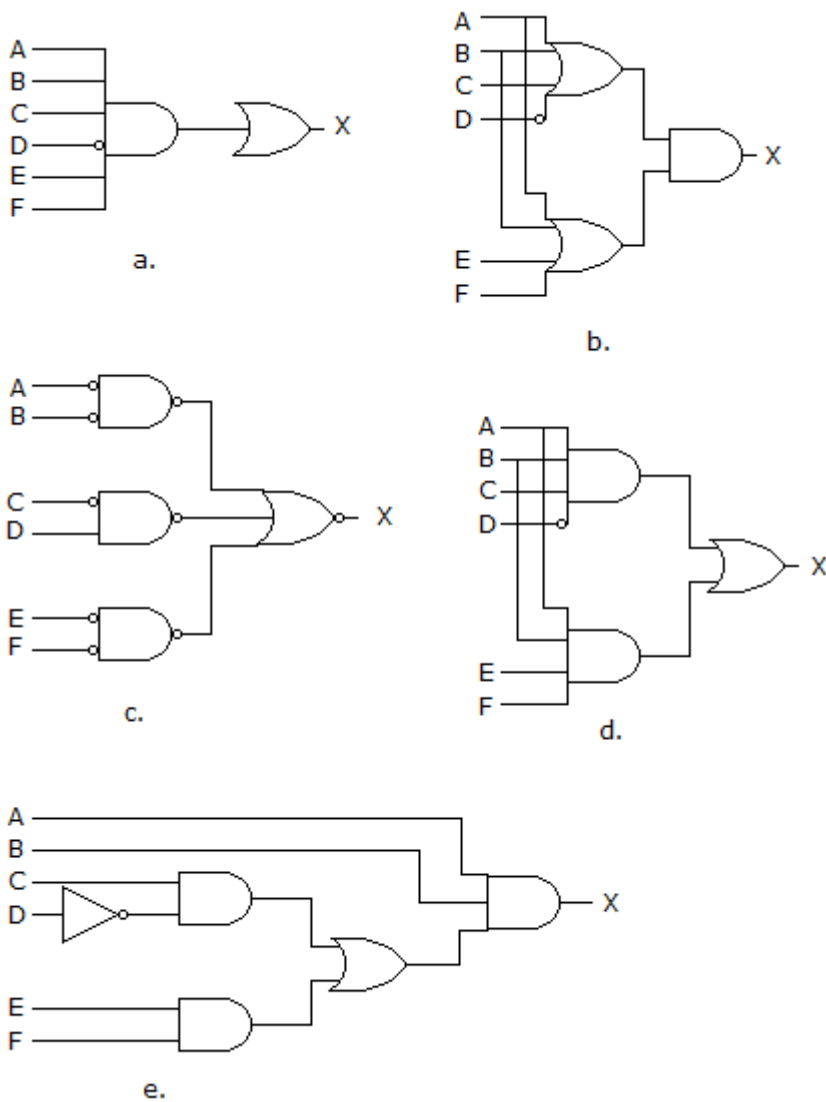
Answer any five questions.

1. The output of an AND gate with three inputs, A, B, and C, is HIGH when _____.
 - A. $A = 1, B = 1, C = 0$
 - B. $A = 0, B = 0, C = 0$
 - C. $A = 1, B = 1, C = 1$
 - D. $A = 1, B = 0, C = 1$

2. If a 3-input NOR gate has eight input possibilities, how many of those possibilities will result in a HIGH output?
 - A. 1
 - B. 2
 - C. 7
 - D. 8

3. What are the pin numbers of the outputs of the gates in a 7432 IC?
 - A. 3, 6, 10, and 13
 - B. 1, 4, 10, and 13
 - C. 3, 6, 8, and 11
 - D. 1, 4, 8, and 11

4. Which of the circuits in figure (a to d) is the sum-of-products implementation of figure (e)?



- A. a
- B. b
- C. c
- D. d

5. The simplest equation which implements the K-map shown below is:

	\bar{C}	C
$\bar{A}\bar{B}$	0	0
$\bar{A}B$	1	1
AB	1	1
$A\bar{B}$	0	1

- A. $X = AC + B$
- B. $X = A\bar{B}$

C. $AB\bar{C} + ABC + A\bar{B}C$

D. $AB + \bar{A}B$

6. How is a J-K flip-flop made to toggle?

A. $J = 0, K = 0$

B. $J = 1, K = 0$

C. $J = 0, K = 1$

D. $J = 1, K = 1$

7. The bit sequence 0010 is serially entered (right-most bit first) into a 4-bit parallel out shift register that is initially clear. What are the Q outputs after two clock pulses?

A. 0000

B. 0010

C. 1000

D. 1111

Answer any one question.

5x1=5

1. What are sum of product (SOP) and product of sum (POS) forms of a Boolean function? Show that they are equivalent.

2+3=5

2. Modify an S-R flip-flop with two AND gates to form a J-K flip-flop. Give the truth - table and verify it. Convert a J-K flip-flop into a delay (D-type) unit. 5