

BACHELOR OF COMPUTER APPLICATION
FIRST SEMESTER (REPEAT)
DIGITAL LOGIC & DESIGN
BCA-103
[USE OMR SHEET FOR OBJECTIVE PART]

SET
A

Duration: 3 hrs.

Full Marks: 70

(Objective)

Time: 30 mins.

Marks: 20

Choose the correct answer from the following:

1 × 20 = 20

- How many AND gates are required to realize $Y = CD + EF + G$?
a. 4
b. 5
c. 3
d. 2
- The NOR gate output will be high if the two inputs are:
a. 00
b. 01
c. 10
d. 11
- A decoder converts N inputs tooutputs.
a. N
b. N^2
c. 2^N
d. N^N
- How many truth table entries are necessary for a four-input circuit?
a. 4
b. 8
c. 12
d. 16
- A full adder can be made out of:
a. Two half adders
b. Two half adders and OR gate
c. Two half adders and NOT gate
d. Three half adders
- Which device has one input and many outputs?
a. De multiplexer
b. Multiplexer
c. Counter
d. Flip-flop
- In a sequential circuit, the output at any time depends only on the input values at that time.
a. Past output values
b. Intermediate values
c. Both past output and present input
d. Present input values
-device accepts or receives the data or instruction from outside.
a. Output device
b. Control unit
c. Input device
d. None of the above
- The D flip-flop hasinputs.
a. 1
b. 3
c. 2
d. 4
- The full form of SR is:
a. System rated
b. Set reset
c. Set ready
d. None of the above

11. What is the addition of the binary numbers 11011011010 and 010100101?
- 0111001000
 - 1100110110
 - 1110111111
 - None of the above
12. The decimal equivalent of the octal number $(645)_8$ is.....
- $(450)_{10}$
 - $(451)_{10}$
 - $(421)_{10}$
 - $(501)_{10}$
13. On subtracting $(01010)_2$ from $(11110)_2$ using 1's complement, we get.....
- 01001
 - 11010
 - 10101
 - 10100
14. The largest two digit hexadecimal number is.....
- $(FE)_{16}$
 - $(FD)_{16}$
 - $(FF)_{16}$
 - $(EF)_{16}$
15. Which of the following expressions is in the sum of product(SOP) form ?
- $(A+B)(C+D)$
 - $(A)B(CD)$
 - $AB(CD)$
 - $AB+CD$
16. DeMorgan's theorem states that.....
- $(AB)' = A' + B'$
 - $(A + B)' = A' * B'$
 - $A' + B' = A'B'$
 - $(AB)' = A' + B$
17. $(A + B)(A' * B') = ?$
- 1
 - 0
 - AB
 - AB'
18. The expression $Y=AB+BC+AC$ shows theoperation.
- EX-OR
 - SOP
 - POS
 - NOR
19. A K-map is a systematic way of reducing which type of expression?
- Product of sums
 - Exclusive NOR
 - Sum of products
 - None of the above
20. When A',B' are the inputs to a NAND gate, according to De- Morgan's theorem, the output expression could be:
- $X= A+B$
 - $X=(AB)'$
 - $X=(A)(B)$
 - None of the above

(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. How many types of shift registers are available? Explain each of them with diagram. 10
2. a) Write the truth table and draw logic circuit diagram for full adder. 5+5=10
b) Explain octal to binary encoder.
3. Write short notes on *any two*: 5+5=10
 - a) SR Flip Flop
 - b) Synchronous Down counter
 - c) 8:1 Multiplexer
4. a) Explain Master- Slave JK flip-flop. 4+6=10
b) Explain mod-13 negative edge asynchronous up counter with diagram.
5. a) Perform the following subtractions using 1's and 2's complement methods: 4+4+2=10
 - i) $1101_{(2)} - 1010_{(2)}$
 - ii) $10101_{(2)} - 10111_{(2)}$b) Convert $4AB_{16}$ to binary.
6. Minimize the following with the help of K-map and draw the logic circuit for the minimized expression. 5+5=10
 - a) $F = \Sigma(2,3,4,5,6,7,9,12,13,14,15)$
 - b) $F = ac' + a'b'c' + a'b + ab$
7. Simplify the following expression: 4+6=10
 - a) $X = [AB'(C+BD) + A'B']C$
 - b) $X = A' + AB + AC' + AB'C'$
8. Write truth table and logic diagram of all the following gates: 10
 - a) AND
 - b) OR
 - c) NAND
 - d) NOR
 - e) Ex-OR

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