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Reg. No. :

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JASE 21

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2019.

Second Semester

Computer Science/Software Engineering – Allied

DIGITAL DESIGN

(For those who joined in July 2016 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. $(214)_8 = ?$

(a) $(140)_{10}$

(b) $(141)_{10}$

(c) $(142)_{10}$

(d) $(130)_{10}$

2. Output will be a Low for any case when one or more inputs are zero is _____.
- (a) OR gate (b) AND gate
(c) NOT gate (d) NOR gate
3. The Boolean expression $Y = AB$ is logically equivalent to _____ gate.
- (a) NAND (b) NOR
(c) AND (d) OR
4. The Associative Law is $A + (B + C) =$ _____.
- (a) $AB + AC$ (b) $(A + B) + C$
(c) $A + B + C$ (d) $A(B + C)$
5. $Y = \overline{AB} + A\overline{B}$ is a boolean equation for _____ Gate.
- (a) AND (b) OR
(c) XOR (d) NOR
6. The 2's complement representation for -15 is _____.
- (a) 00001111 (b) 11110000
(c) 11110001 (d) 00000001

7. In JK master - slave flip - flop, while the clock is _____, the master is _____ and the slave is inactive.

- (a) Low, inactive (b) High, active
(c) Low, active (d) High, inactive

8. A simple flip - flop is _____.

- (a) 2 bit memory
(b) 1 bit memory
(c) a four state device
(d) Nothing to do memory

9. In digital logic, a counter is a device which

- (a) Counts the number of outputs
(b) Stores the number of time a particular event or process has occurred
(c) Counts the number of times a clock pulse rises and falls.
(d) Counts the number of bits in memory.

10. What is the clock frequency if the period of wave form at ripple of counter is $24\mu\text{s}$?

- (a) 61 (b) 62
(c) 63 (d) 64

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Convert the following

(i) $(11101)_2$ to decimal

(ii) $(32)_{10}$ to Binary

(iii) $(43)_{10}$ to octal

(iv) $(16)_{10}$ to Hexadecimal

(v) $(24)_{10}$ to Hexadecimal

Or

(b) Draw the logic circuit for the following boolean equation.

$$y = ABC\bar{C} + \bar{A}BC + \bar{A}\bar{B}C + \bar{A}BC$$

12. (a) Explain sum of products method with examples.

Or

(b) Explain products of sum method with examples.

13. (a) Draw exclusive – OR gates diagram and Explain with truth table.

Or

- (b) Explain sign – magnitude numbers with 2's complement arithmetic. Give examples.

14. (a) What is flip – flop? Explain its uses.

Or

- (b) Describe it Types of Registers.

15. (a) What is decoding Gates? Explain.

Or

- (b) How many flip – flops are required to construct \Rightarrow a mod –128 and a mod –32 counter. Discuss.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Describe the basic and Universal Logic Gates with truth tables.

Or

- (b) What are Binary, Octal and Hexadecimal numbers? Explain and Give examples.

17. (a) Write the boolean Laws and prove the theorems.

Or

- (b) Describe how to construct a Karnaugh map? Give examples for Two, Three and Four variable maps.

18. (a) Explain seven – segment decoders with diagram.

Or

- (b) Convert each of the following decimal numbers to an 8 – bit sign – magnitude number.

(i) +36

(ii) –97

(iii) –55

(iv) +74

also convert the sing – magnitude numbers in to hexadecimal form.

19. (a) Explain about JK master slave Flip Flops.

Or

- (b) Explain (i) RS Flip – Flops

(ii) Edge Triggered D flip flops.

20. (a) What is Asynchronous counter? Explain.

Or

- (b) Explain about Decade and Presetable counters.