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Reg. No. : .....

Code No. : 41216 E      Sub. Code : JACS 21/  
JASE 21

B.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 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.  $(171)_{10}$  is equivalent to \_\_\_\_\_.

(a)  $(FD)_{16}$                       (b)  $(AA)_{16}$

(c)  $(AB)_{16}$                       (d)  $(AC)_{16}$

2. Which of the following logical operation is represented by the  $+ \sin n$  in Boolean algebra?
- (a) AND                              (b) OR  
(c) NOT                                (d) Inversion
3. Which of the examples below expresses the commutative Law of Multiplication?
- (a)  $A + B = B + A$               (b)  $A \cdot B = B + A$   
(c)  $A \cdot B = B \cdot A$               (d)  $A + B = B \cdot A$
4. The distributive Law,  $A(B + C) = \underline{\hspace{2cm}}$ .
- (a)  $(A + B) + C$                   (b)  $AB + AC$   
(c)  $A + (B + C)$                   (d)  $AB \cdot AC$
5. \_\_\_\_\_ are useful for decimal displays.
- (a) Encoders  
(b) Seven – Segment decoders  
(c) Multiplexers  
(d) None
6. A multiplexer with 4-bit data, selects input as a \_\_\_\_\_.
- (a) 4 : 1                                (b) 2 : 1  
(c) 16 : 1                                (d) 8 : 1

7. The 2's complement representation of -10 is \_\_\_\_\_.

- (a) 00001010                      (b) 00000110  
(c) 1111 0110                      (d) 1111 1010

8. The functional difference between RS and JK flip is that

- (a) JK flip-flop is faster than RS flip-flop  
(b) JK flip-flop has a feedback path  
(c) JK flip-flop accepts both inputs 1  
(d) None of them

9. Ripple counters are also called as \_\_\_\_\_.

- (a) Asynchronous counter  
(b) Synchronous counter  
(c) SSI counter  
(d) VLSI counter

10. An asynchronous 4-bit binary down counter changes from count 2 to count 3. How many transitional state are required?

- (a) Six                                      (b) Two  
(c) Four                                      (d) Fifteen

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Describe the logic gates with Truth tables.

Or

(b) What do you mean by positive and Negative Logic? Explain.

12. (a) Describe the Boolean Laws.

Or

(b) Discuss about Don't Care Conditions.

13. (a) Convert the following decimal numbers to an 8-bit sign-magnitude number.

(i) +5

(ii) -15

(iii) -23

(iv) -45

(v) 75

Also convert the answer to hexadecimal from.

Or

(b) The following hexadecimal numbers represent sign - magnitude numbers. Convert each to its decimal equivalent.

(i)  $(FF)_{16}$

(ii)  $(8F)_{16}$

14. (a) Describe RS Flip Flops.  
Or

(b) Discuss about Universal Shift Register.

15. (a) What is Decoding Gates? Explain.  
Or

(b) Define :

(i) Asynchronous counter

(ii) Synchronous counter.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

16. (a) Convert the following :

(i)  $(110111011)_2$  to Decimal

(ii)  $(155)_{10}$  to Binary

(iii)  $(4574)_{10}$  to Octal

(iv)  $(1235)_{10}$  to Hexa decimal.

Or

(b) Convert the following :

(i)  $(FFA)_{16}$  to Binary

(ii)  $(324)_8$  to Decimal

(iii)  $(256)_{10}$  to Binary

(iv)  $(111000101010)_2$  to Hexa decimal.

17. (a) Explain Karnaugh Maps with Two, Three and Four variable map examples.

Or

(b) Explain Pairs, Quads and Octets with Algebraic Proof.

18. (a) Explain about Multiplexers and De-Multiplexers.

Or

(b) Explain Seven - Segment Decoders with diagram.

19. (a) Explain JK Flip Flops.

Or

(b) Explain the Types of Registers in detail.

20. (a) Explain Ripple counter with block diagram.

Or

(b) Describe Synchronous Counter.