Reg. No. : ....

Code No. : 30312 E   **Sub. Code : JMPH 61/ SMPH 61**

B.Sc. (CBCS) DEGREE EXAMINATION,
APRIL 2020.

Sixth Semester

Physics – Main

DIGITAL ELECTRONICS

(For those who joined in July 2016 onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The number of bits in a binary number of length 2 bytes is ——————.

    (a)   8   (b)   4

    (c)   16   (d)   none

2. The one's complement of 10010 is —————.

   (a) 01101   (b) 011100

   (c) 11111   (d) none

3. According to De Morgan's first theorem, $\overline{A+B}$ =

   (a) $\overline{A.B}$ (b) $\overline{A}+\overline{B}$

   (c) $\overline{A}\cdot\overline{B}$ (d) none

4. The OR gate is equivalent to ————— of inputs.

   (a) Product   (b) Sum

   (c) Subtraction   (d) None

5. A flip flop is a bistable electronic device that has ————— stable states.

   (a) three   (b) one

   (c) two   (d) none

6. The condition for carrier in a Half Adder is —————.

   (a) $C = A + B$ (b) $C = A - B$

   (c) $C = A \cdot B$ (d) none

7. For a *n*-variable problem there can be ———— minterms.

   (a) $2n$ (b) $2/n$

   (c) 2^n (d) none

8. The don't care condition in a Karnaugh map is referred by ————.

   (a) 1   (b) 0

   (c) X (d) none

9. Shift Register is used to ———— pulses.

   (a) Add   (b) Subtract

   (c) Count   (d) None

10. The A/D converter, converts ———— in to ————.

    (a) analog, digital   (b) digital, analog

    (c) decimal, binary   (d) none

PART B — (5 × 5 = 25 marks)

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

Answer should not exceed 250 words.

11. (a) Convert the hexadecimal numbers 2F59 and AB10 into binary numbers.

Or

(b) Explain the excess three code with an example.

12. (a) State and prove De Morgan's theorems.

Or

(b) Draw the symbols and truth tables for AND and OR gates.

13. (a) Explain the working of Half adder.

Or

(b) Explain the working of R–S flip-flop.

14. (a) Explain two variable Karnaugh map.

Or

(b) Explain the implementation of POS form using NAND gate.

15. (a) What are the types of Registers?

Or

(b) Explain the working of Asynchronous counter.

PART C — (5 × 8 = 40 marks)

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

Answer should not exceed 600 words.

16. (a) Explain the conversion of

(i) hexadecimal number into binary number and

(ii) binary number into hexadecimal number.

Or

(b) Explain binary subtraction by 2's complement method with an example.

17. (a) Explain the postulate and theorems of Boolean algebra.

Or

(b) Explain the universality of NOR gate.

18. (a) Explain the working of Full adder.

Or

(b) What are the types of flip-flop? Explain the working of Master Slave flip-flop.

19. (a) Explain the SOP form of Boolean functions.

Or

(b) Using Karnaugh map simplify :

$$Y = F(A,B,C,D) = \sum M (7,9,10,11,12,13,14,15)$$

20. (a) Explain the working of decade counter.

Or

(b) Explain the working of D/A converter.

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