K20U 0347

Reg. No. : .....

Name : .....

II Semester B.C.A. Degree (CBCSS – Supple./Improv.) Examination, April 2020
(2014-2018 Admissions)
CORE COURSE
2B02 BCA : Digital Systems

Time : 3 Hours Max. Marks : 40

SECTION – A

Answer **all** questions. **Half** mark **each** :

1. a) _____ waveform is one that repeats itself at a fixed interval.
   b) _____ is the unit of measurement of frequency.
   c) Name the IC with AND-OR logic.
   d) A diagram of input and output waveforms showing time relationships is called _____.
   e) ▷ in a flip-flop diagram is called _____.
   f) Combination of binary digits that represent numbers, letters or symbols are called _____.
   g) Write an invalid bit combination in excess-3 code.
   h) Modulus-10 Johnson counter requires _____ number of flip-flops.

SECTION – B

Answer **any 7** questions. **2** marks **each** :

2. What is multiplexing ?
3. Distinguish between encoder and decoder.
4. Draw a logic diagram to decode 1011 with active-low output.
5. State self-complementing property.
6. What is look-ahead-carry addition ?

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7. Draw the logic diagram and timing diagram of a gated D flip-flop.
8. What is mean by pulse-triggered flip-flop ?
9. Draw the logic diagram of a 2-bit asynchronous binary counter.
10. Explain DeMorgan's theorem.
11. Draw the circuit and truth table of an SR latch.

SECTION – C

Answer **any 4** questions. **3** marks **each** :

12. Simplify the following expressions using Boolean algebra.
    a) $(\bar{A}+B)C+ABC$
    b) $A\bar{B}C(BD+CDE)+A\bar{C}$.
13. Draw the logic diagram of a decimal keyboard encoder.
14. Perform the following binary operations.
    a) 10001 – 1101
    b) 1101 × 1011
    c) 1111 ÷ 110
15. Draw the logic diagram and timing diagram of an asynchronous decade counter.
16. Perform the following conversions :
    a) $(35.625)_{10}$ to binary
    b) $(1101.101)_2$ to decimal
    c) 723_8 to hexadecimal.
17. Explain up/down counter in detail.

SECTION – D

Answer **any 2** questions. **5** marks **each** :

18. Implement the functions of basic gates using universal gates.
19. Draw the logic symbol, logic diagram and truth table of half-adder and full adder.
20. Discuss about different types of shift registers.
21. Write a note on K-map. Minimise the following expression.
    $\bar{B}\bar{C}\bar{D}+\bar{A}B\bar{C}\bar{D}+AB\bar{C}\bar{D}+\bar{A}\bar{B}CD+A\bar{B}CD+\bar{A}\bar{B}C\bar{D}+ABC\bar{D}+A\bar{B}C\bar{D}$