Roll No. _____   Section_____

Digital Logic Design

Marks: 40   **Time: 25 mins**

<u>*Note:*</u>
- There are 2 printed sides in this question paper.
- This part of the paper comprises of 20 MCQ's
- Encircle the correct option to each question on this paper.
- Cutting or overwriting is not allowed.
- Once done, hand in the question paper with your roll no. and Section mentioned on top.

Q1) Odd parity of a word can be conveniently tested by
    A. OR gate   B. AND gate   C. NOR gate   D. XOR gate

Q2) Identify the logic function performed by the circuit shown in the given figure:
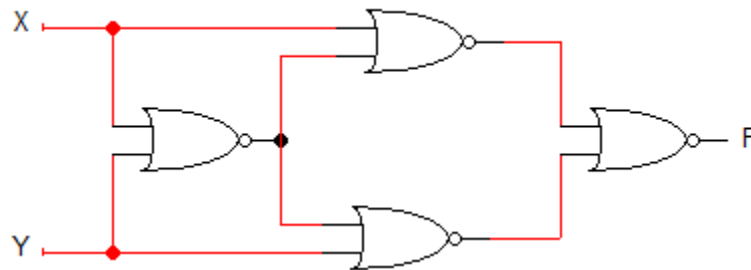
    A. XOR gate   B. XNOR gate   C. NOR gate   D. NAND gate

Q3) The number of full and half-adders required to add two 16-bit numbers is
    A. 8 half-adders, 8 full-adders   B. 1 half-adder, 15 full-adders
    C. 16 half-adders, 0 full-adders   D. 4 half-adders, 12 full-adders

Q4) Which of the following gates would output 1 when one input is 1 and other input is 0 ?
    A. OR gate   B. AND gate   C. NAND gate   D. both (A) and (C)

Q5) A demultiplexer is used to
    A. Route the data from single input to one of many outputs
    B. Select data from several inputs and route it to single output
    C. Perform serial to parallel conversion
    D. All of the above

Q6) An OR gate can be thought of as
    A. Switches connected in series   B. Switches connected in parallel
    C. MOS transistors connected in series   D. None of the above

Q7) Which combination of gates does not allow the implementation of an arbitrary boolean function?
    A. OR gates and AND gates only   B. OR gates and exclusive OR gate only
    C. OR gates and NOT gates only   D. NAND gates only

Q8) Parallel adders are
    A. combinational logic circuits   B. sequential logic circuits
    C. both (A) and (B)   D. None of these

Q9) A comparison between serial and parallel adder reveals that serial adder
    A. is slower   B. is faster   C. operates at the same speed as parallel adder
    D. is more complicated

Q10) What is the largest number of data inputs which a data selector with two control inputs can have ?
    A. 2   B. 4   C. 8   D. 16

Q11) A combinational circuit is one in which the output depends on the
    A. input combination at the time
    B. input combination and the previous output
    C. input combination at that time and the previous input combination
    D. present output and the previous output

Q12) The function of a multiplexer is
    A. to decode information
    B. to select 1 out of N input data sources and to transmit it to single channel
    C. to transmit data on N lines
    D. to perform serial to parallel conversion

Q13) If $A \oplus B = C$, then
    A. $A \oplus C = B$ B. $B \oplus C = A$ C. $A \oplus B \oplus C = 0$ D. All of these

Q14) The number of flip-flops required in a modulo N counter is
    A. $\log_2 (N) + 1$ B. $\log_2(N-1)$ C. $\log_2 (N)$ D. $N \log_2 (N)$

Q15) The number of clock pulses needed to shift one byte of data from input to the output of a 4-bit shift register is
    A.   10   B.   12   C.   16   D.   32

Q16) If the input J is connected through K input of J-K, then flip-flop will behave as a
    A. D type flip-flop   B. T type flip-flop   C. S-R flip-flop
    D. Master slave JK flip-flop

Q17) A Register is a
    A. set of capacitor used to register input instructions in a digital computer
    B. set to paper tapes and cards put in a file
    C. temporary storage unit within the CPU having dedicated or general purpose use
    D. part of the main memory

Q18) The 9's complement of 381 is
    A.   355   B.   508   C.   618   D.   390

Q19) A computer with a 32-bit word size uses signed 2's complement notation to represent numbers. The range of integers that can be represented by this computer is
    A.- 2^{32} to $+2^{32}$ B. -2^{32} to $+2^{31}$ C. -2^{31} to $+(2^{31}-1)$ D. $- 2^{32}$ to $+2^{31}$

Q20) How many different numbers can a 6-bit binary word represent?
    A.   63   B.   64   C.   124   D.   128