DE-2931
First Year B. Sc. (Sem. I) Examination
March / April – 2016
Applied Electronics : Paper - II
(Digital Electronics)

Time : 2 Hours] [Total Marks : 50

Instructions :

(1) Fill up strictly the details of signs on your answer book.

Name of the Examination :
FIRST YEAR B. Sc. (SEM. 1)

Name of the Subject :
APPLIED ELECTRONICS - 2

Subject Code No. : 2 9 3 1
Section No. (1, 2, .......) : 1, 2, 3

(2) All 28 questions are compulsory.

(3) Symbols and abbreviations used in the paper have their usual meaning.

(4) Non-programmable calculators are allowed.

Q. 1 to 12 Multiple choice questions : (1 mark)
Q. 13 to 22 Multiple Choice Questions : (2 marks)
Q. 23 to 28 Multiple Choice Questions : (3 marks)

O.M.R. Sheet भरवा अंश-नी अंग-नी सूचनाओ अंपै सृजनाे। O.M.R. Sheet-ल साज भरेब। च।
Important instructions to fill up O.M.R. Sheet is given back side of provided O.M.R. Sheet.
1. What are the symbols used to represent digits in the binary number system?
   (A) 0, 1
   (B) 0, 1, 2
   (C) 0 through 8
   (D) 1, 2

2. A full subtracter circuit requires ______.
   (A) two inputs and two outputs
   (B) two inputs and three outputs
   (C) three inputs and one output
   (D) three inputs and two outputs

3. The output of an AND gate is LOW ______.
   (A) all the time
   (B) when any input is LOW
   (C) when any input is HIGH
   (D) when all inputs are HIGH

4. Give the decimal value of binary 10010.
   (A) 6
   (B) 9
   (C) 18
   (D) 20
5 The output of an AND gate with three inputs, A, B, and C, is HIGH when _______.
   (A) A = 1, B = 1, C = 0
   (B) A = 0, B = 0, C = 0
   (C) A = 1, B = 1, C = 1
   (D) A = 1, B = 0, C = 1

6 If a 3-input NOR gate has eight input possibilities, how many of those possibilities will result in a HIGH output?
   (A) 1
   (B) 2
   (C) 7
   (D) 8

7 The output of a NOR gate is HIGH if _______.
   (A) all inputs are HIGH
   (B) any input is HIGH
   (C) any input is LOW
   (D) all inputs are LOW

8 The Boolean expression for a 3-input AND gate is _______.
   (A) X=AB
   (B) X = ABC
   (C) X=A+B+C
   (D) X=AB+C
What does the small bubble on the output of the NAND gate logic symbol mean?
(A) open collector output
(B) tristate
(C) The output is inverted.
(D) None of these

Logically, the output of a NOR gate would have the same Boolean expression as a(n):
(A) NAND gate immediately followed by an inverter
(B) OR gate immediately followed by an inverter
(C) AND gate immediately followed by an inverter
(D) NOR gate immediately followed by an inverter

The basic logic gate whose output is the complement of the input is the:
(A) OR gate
(B) AND gate
(C) inverter
(D) comparator

Which of the following equations would accurately describe a four-input OR gate when \(A = 1, B = 1, C=0,\) and \(D=0\)?
(A) \(1 + 1 + 0 + 0 = 01\)
(B) \(1 + 1 + 0 + 0 = 1\)
(C) \(1 + 1 + 0 + 0 = 0\)
(D) \(1 + 1 + 0 + 0 = 00\)
13 Which of the following is not a basic Boolean operation?
   (A) OR
   (B) NOT
   (C) AND
   (D) FOR

14 When does the output of a NAND gate = 1?
   (A) Whenever a 0 is present at an input
   (B) Only when all inputs = 0
   (C) Whenever a 1 is present at an input
   (D) Only when all inputs = 1

15 Convert binary number 01011 to decimal.
   (A) 11
   (B) 35
   (C) 15
   (D) 10

16 Convert decimal 64 to binary.
   (A) 01010010
   (B) 01000000
   (C) 00110110
   (D) 01001000

17 The BCD number for decimal 347 is ______.
   (A) 1100 1011 1000
   (B) 0011 0100 0111
   (C) 0011 0100 0001
   (D) 1100 1011 0110
18 The sum of 1101 + 1011 equals _____.
   (A) 110011
   (B) 100001
   (C) 110100
   (D) 100100

19 A decimal 11 in BCD is _____.
   (A) 00001011
   (B) 00001100
   (C) 00010001
   (D) 00010010

20 The difference of 111 - 001 equals _____.
   (A) 100
   (B) 111
   (C) 001
   (D) 110

21 Which of the following is an invalid BCD code ?
   (A) 0011
   (B) 1101
   (C) 0101
   (D) 1001

22 The binary number 11001110 is equal to the decimal number_____.
   (A) 12
   (B) 206
   (C) 127
   (D) 66
23. The base of the hexadecimal system is _____.

(A) eight

(B) sixteen

(C) ten

(D) two

24. Which of the following expressions is in the sum-of-products (SOP) form?

(A) \((A + B)(C + D)\)

(B) \((A)B(CD)\)

(C) \(AB(CD)\)

(D) \(AB + CD\)

25. How many gates would be required to implement the following Boolean expression before simplification?

\(XY + X(X + Z) + Y(X + Z)\)

(A) 1

(B) 2

(C) 4

(D) 5
The NAND or NOR gates are referred to as "universal" gates because either:

(A) can be found in almost all digital circuits

(B) can be used to build all the other types of gates

(C) are used in all countries of the world

(D) were the first gates to be integrated

Which of the examples below expresses the distributive law of Boolean algebra?

(A) \( (A + B) + C = A + (B + C) \)

(B) \( A(B + C) = AB + AC \)

(C) \( A + (B + C) = AB + AC \)

(D) \( A(BC) = (AB) + C \)

Which of the following combinations cannot be combined into K-map groups?

(A) corners in the same row

(B) corners in the same column

(C) diagonal

(D) overlapping combinations