DE-2923
First Year B. Sc. (Sem. I) Examination
March / April – 2016
Electronics : Paper - II
(Digital Electronics)

Time : 2 Hours] [Total Marks : 50

Instructions :

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

Name of the Examination :
FIRST YEAR B. Sc. (SEM. 1)
Name of the Subject :
ELECTRONICS - 2
Subject Code No. : 2 9 2 3 Section No. (1, 2,.....) 1,2,3

(2) This exam contains 28 multiple choice questions.

(3) Figure on the right indicates full marks

(4) All symbols and abbreviations have their usual meaning.

(5) Non-programmable calculators are allowed.

(6) Assume data if necessary.

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 भरणा अंगेली अनतपानी सूचनाएँ आपेक्ष
O.M.R. Sheet-ली पावले अपेक्ष से।

Important instructions to fillup O.M.R. Sheet
is given back side of provided O.M.R. Sheet.
1 Which of the examples below expresses the distributive law of Boolean algebra?

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

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

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

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

2 Which of the examples below expresses the commutative law of multiplication?

(A) \( AB = A \times B \)

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

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

(D) \( AB = BA \)

3 Most de-multiplexers facilitate which type of conversion?

(A) odd parity to even parity

(B) decimal-to-hexadecimal

(C) single input, multiple outputs

(D) ac to do

4 One application of a digital multiplexer is to facilitate:

(A) data selector

(B) data generation

(C) serial-to-parallel conversion

(D) parity checking
5 The primary use for Gray code is:
   (A) to convert the angular position of a shaft on rotating machinery into hexadecimal code
   (B) coded representation of a shaft's mechanical position
   (C) turning on/off software switches
   (D) to represent the correct ASCII code to indicate the angular position of a shaft on rotating machinery

6 Which of the following decimal number is equivalent to binary number 110111₂?
   (A) 57
   (B) 65
   (C) 55
   (D) 75

7 Which of the following binary number is equivalent to decimal number 20?
   (A) 11111
   (B) 10001
   (C) 10101
   (D) 10100

8 What is the difference between binary coding and binary coded decimal?
   (A) BCD has no decimal format
   (B) Binary coding is pure binary
   (C) BCD is pure binary
   (D) Binary coding has a decimal format
9. The code which can represent numbers, characters and special characters are called
   (A) Alphanumeric code
   (B) Gray code
   (C) BCD code
   (D) EBCDIC code

10. If a 3-input OR gate has eight input possibilities, how many of those possibilities will result in a HIGH output?
   (A) 8
   (B) 1
   (C) 2
   (D) 7

11. What is the circuit number of the IC that contains four two-input AND gates in standard TTL?
   (A) 7432
   (B) 7402
   (C) 7404
   (D) 7408

12. The logic expression for a NOR gate is ________.
   (A) \( X = \overline{A + B} \)
   (B) \( X = \overline{A} + B \)
   (C) \( X = A + \overline{B} \)
   (D) \( X = A + B \)
A basic multiplexer principle can be demonstrated through the use of a:

(A) linear stepper
(B) single-pole relay
(C) DPDT switch
(D) rotary switch

A+(B+C)=(A+B)+C and A.(B+C)=(A.B)+(A.C) are _____ and _____ law of Boolean algebra

(A) consensus, distributive
(B) commutative, associative
(C) associative, distributive
(D) commutative, distributive

A binary code that progresses such that only one bit changes between two successive codes is:

(A) Gray code
(B) nine's-complement code
(C) 8421 code
(D) excess-3 code

How many select lines would be required for an 8-line-to-1-line multiplexer?

(A) 8
(B) 2
(C) 3
(D) 4

Most de multiplexers facilitate which type of conversion?

(A) odd parity to even parity
(B) decimal-to-hexadecimal
(C) single input, multiple outputs
(D) ac to dc
18 Which of the following decimal number is equivalent to octal number \((125)_8\)
   (A) 85
   (B) 95
   (C) 65
   (D) 75

19 3428 is the decimal value for which of the following binary coded decimal (BCD) groupings?
   (A) 110100001101010
   (B) 11010001001000
   (C) 11010000101000
   (D) 01101001000010

20 What is binary code of 0110 and 0111 gray code?
   (A) 1010,0011
   (B) 0100,0101
   (C) 0101,0101
   (D) 1111,0001

21 What is the gray code of decimal number 12?
   (A) 0001
   (B) 1110
   (C) 1010
   (D) 1111

22 One of De Morgan's theorems states that \(\overline{X+Y} = \overline{X} \cdot \overline{Y}\). Simply stated, this means that logically there is no difference between:
   (A) a NOR and a NAND gate with inverted input
   (B) a NOR and an AND gate with inverted inputs
   (C) a NAND and an OR gate with inverted inputs
   (D) an AND and a NOR gate with inverted inputs
23. Simplify: \( A + BC = \) ______
   (A) \( A(B+C) \)
   (B) \( (A.C)+(A.B) \)
   (C) \( (A+B)(A+C) \)
   (D) \( AB+A \)

24. Simplify \( A+0 = \) ______ \( A+A = \) ______ and \( A+1 = \) ______
   (A) \( A, A, A \)
   (B) \( A, A, 1 \)
   (C) \( 1, 1, A \)
   (D) \( A, A, 0 \)

25. It u, apply \( A=0, B=1 \) as input and \( C_i = 1 \) is the carry of the previous stage in full adder circuit then \( S = \) _____ and \( C = \) _____
   (A) \( S=1, C=0 \)
   (B) \( S=0, C=1 \)
   (C) \( S=0, C=0 \)
   (D) \( S=1, C=1 \)
26 If u apply A = 1, B = 1 as input and B_i = 0 is the borrow in full subtractor circuit then difference D = _______ and B_0 borrow out = _______

(A) S =1 C = 01
(B) D = 0 B_0 = 0
(C) D = 0 B_0 = 1
(D) D = 1 B_0 = 0

27 Which of the following Octal number is equivalent to decimal number 543.26?

(A) (1037.205)_8
(B) (1027.105)_8
(C) (1037.201)_8
(D) (1037.200)_8

28 What is the decimal value of the hexadecimal number 3C9A?

(A) 13414
(B) 15524
(C) 15514
(D) 14414