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 \( \text{signs} \) 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
Seat No. :
Student's Signature

(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 Choise Questions : (2 marks)
Q. 23 to 28 Multiple Choice Questions : (3 marks)

\textbf{O.M.R. Sheet अंगेली अंलाली सुरुजनो अथे O.M.R. Sheet-वी पाच अंसे हे.}
Important instructions to fillup O.M.R. Sheet is given back side of provided O.M.R. Sheet.

DE-2923_A ] 1 [ Contd...
1. Which of the following decimal number is equivalent to binary number $110111_2$?
   (A) 65
   (B) 55
   (C) 75
   (D) 57

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

3. What is the difference between binary coding and binary coded decimal?
   (A) Binary coding is pure binary
   (B) BCD is pure binary
   (C) Binary coding has a decimal format
   (D) BCD has no decimal format

4. The code which can represent numbers, characters and special characters are called
   (A) Gray code
   (B) BCD code
   (C) EBCDIC code
   (D) Alphanumeric code
5. If a 3-input OR gate has eight input possibilities, how many of those possibilities will result in a HIGH output?
   (A) 1
   (B) 2
   (C) 7
   (D) 8

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

7. The logic expression for a NOR gate is ________.
   (A) \( X = \overline{A} + B \)
   (B) \( X = A + \overline{B} \)
   (C) \( X = A + B \)
   (D) \( X = A + B \)

8. 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) \( A(BC) = (AB) + C \)
9 Which of the examples below expresses the commutative law of multiplication?
   (A) \( A + B = B + A \)
   (B) \( AB = B + A \)
   (C) \( AB = BA \)
   (D) \( AB = A \times B \)

10 Most de-multiplexers facilitate which type of conversion?
   (A) decimal-to-hexadecimal
   (B) single input, multiple outputs
   (C) ac to do
   (D) odd parity to even parity

11 One application of a digital multiplexer is to facilitate:
   (A) data generation
   (B) serial-to-parallel conversion
   (C) parity checking
   (D) data selector

12 The primary use for Gray code is:
   (A) coded representation of a shaft's mechanical position
   (B) turning on/off software switches
   (C) to represent the correct ASCII code to indicate the angular position of a shaft on rotating machinery
   (D) to convert the angular position of a shaft on rotating machinery into hexadecimal code
13  Which of the following decimal number is equivalent to octal number (125)$_8$
   (A)  95
   (B)  65
   (C)  75
   (D)  85

14  3428 is the decimal value for which of the following binary coded decimal (BCD) groupings?
   (A)  11010001001000
   (B)  11010000101000
   (C)  011010010000010
   (D)  110100001101010

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

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

17  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 an AND gate with inverted inputs
    (B)  a NAND and an OR gate with inverted inputs
    (C)  an AND and a NOR gate with inverted inputs
    (D)  a NOR and a NAND gate with inverted input
18 A basic multiplexer principle can be demonstrated through the use of a:
   (A) single-pole relay
   (B) DPDT switch
   (C) rotary switch
   (D) linear stepper

19 \( A+(B+C) = (A+B)+C \) and \( A.(B+C) = (A.B)+(A.C) \) are _____ and _____ law of Boolean algebra
   (A) commutative, associative
   (B) associative, distributive
   (C) commutative, distributive
   (D) consensus, distributive

20 A binary code that progresses such that only one bit changes between two successive codes is:
   (A) nine's-complement code
   (B) 8421 code
   (C) excess-3 code
   (D) Gray code

21 How many select lines would be required for an 8-line-to-1-line multiplexer?
   (A) 2
   (B) 3
   (C) 4
   (D) 8

22 Most de multiplexers facilitate which type of conversion?
   (A) decimal-to-hexadecimal
   (B) single input, multiple outputs
   (C) ac to dc
   (D) odd parity to even parity
23 Which of the following Octal number is equivalent to decimal number 543.26?

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

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

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

25 Simplify: A+BC =

(A) (A.C)+(A.B)
(B) (A+B)(A+C)
(C) AB+A
(D) A(B+C)
26  Simplify $A+0 =$ _______ $A+A =$ _______ and $A+1 =$ _______

(A)  $A,A,1$

(B)  $1,1,A$

(C)  $A,A,0$

(D)  $A,A,A$

27  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)  $S=0 \ C=1$

(B)  $S=0 \ C=0$

(C)  $S=1 \ C=1$

(D)  $S=1 \ C=0$

28  If u apply $A = 1$, $B = 1$ as input and $B_i = 0$ is the borrow in full substractor circuit then difference $D =$ _______ and $B_0$ borrow out = _______

(A)  $D = 0 \ B_0 = 0$

(B)  $D = 0 \ B_0 = 1$

(C)  $D = 1 \ B_0 = 0$

(D)  $S =1 \ C = 01$