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:
ELECTRONICS - 2

Subject Code No.:
2
Seat No.:
2923

(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)

O.M.R. Sheet भरने अंगेली अंतर्यांनी सूचनाच्या आपेक्ष
O.M.R. Sheet-नी पाहून काढू शकू.
Important instructions to fill up O.M.R. Sheet is given back side of provided O.M.R. Sheet.
1 One application of a digital multiplexer is to facilitate:
   (A) serial-to-parallel conversion
   (B) parity checking
   (C) data selector
   (D) data generation

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

3 Which of the following decimal number is equivalent to binary number \(110111_2\)?
   (A) 55
   (B) 75
   (C) 57
   (D) 65

4 Which of the following binary number is equivalent to decimal number 20?
   (A) 10101
   (B) 10100
   (C) 11111
   (D) 10001
5 What is the difference between binary coding and binary coded decimal?
   (A) BCD is pure binary
   (B) Binary coding has a decimal format
   (C) BCD has no decimal format
   (D) Binary coding is pure binary

6 The code which can represent numbers, characters and special characters are called
   (A) BCD code
   (B) EBCDIC code
   (C) Alphanumeric code
   (D) Gray code

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

8 What is the circuit number of the IC that contains four two-input AND gates in standard TTL?
   (A) 7404
   (B) 7408
   (C) 7432
   (D) 7402
9 The logic expression for a NOR gate is ________.

(A) \( X = A + \overline{B} \)

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

(C) \( X = \overline{A} + B \)

(D) \( X = \overline{A} + B \)

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

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

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

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

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

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

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

(B) \( AB = BA \)

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

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

12 Most de-multiplexers facilitate which type of conversion?

(A) single input, multiple outputs

(B) ac to do

(C) odd parity to even parity

(D) decimal-to-hexadecimal
13. What is binary code of 0110 and 0111 gray code?
   (A) 0101, 0101  
   (B) 1111, 0001  
   (C) 1010, 0011  
   (D) 0100, 0101

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

15. 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 NAND and an OR gate with inverted inputs  
   (B) an AND and a NOR gate with inverted inputs  
   (C) a NOR and a NAND gate with inverted input  
   (D) a NOR and an AND gate with inverted inputs

16. A basic multiplexer principle can be demonstrated through the use of a:
   (A) DPDT switch  
   (B) rotary switch  
   (C) linear stepper  
   (D) single-pole relay

17. \( A + (B + C) = (A + B) + C \) and \( A \cdot (B + C) = (A \cdot B) + (A \cdot C) \) are ______ and ______ law of Boolean algebra.
   (A) associative, distributive  
   (B) commutative, distributive  
   (C) consensus, distributive  
   (D) commutative, associative
18  A binary code that progresses such that only one bit changes between two successive codes is:
(A) 8421 code
(B) excess-3 code
(C) Gray code
(D) nine's-complement code

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

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

21  Which of the following decimal number is equivalent to octal number (125)₈?
(A) 65
(B) 75
(C) 85
(D) 95

22  3428 is the decimal value for which of the following binary coded decimal (BCD) groupings?
(A) 11010000101000
(B) 011010010000010
(C) 110100001101010
(D) 11010001001000

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23. What is the decimal value of the hexadecimal number 3C9A?
   (A) 15514
   (B) 14414
   (C) 13414
   (D) 15524

24. Simplify: \( A+BC = \) ________
   (A) \( (A+B)(A+C) \)
   (B) \( AB+A \)
   (C) \( A(B+C) \)
   (D) \( (A.C)+(A.B) \)

25. Simplify \( A+0= \) ________ \( A+A= \) ________ and \( A+1= \) ________
   (A) 1,1,A
   (B) A,A,0
   (C) A,A,A
   (D) A,A,1
26. It u, apply A=0, B=1 as input and C₁ = 1 is the carry of the previous stage in full adder circuit then S = _____ and C = _____

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

27. If u apply A = 1, B = 1 as input and B₁ = 0 is the borrow in full substractor circuit then difference D = ______ and B₀ borrow out = ______

(A) D = 0 B₀ = 1
(B) D = 1 B₀ = 0
(C) S =1 C = 01
(D) D = 0 B₀ = 0

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

(A) (1037.201)₈
(B) (1037.200)₈
(C) (1037.205)₈
(D) (1027.105)₈