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SARDAR PATEL UNIVERSITY

B.Sc. (3rd Semester) Examination

Wednesday,27th November 2019

2:00 p.m. to 5:00 p.m.

US03CELE22 - Instrumentation & Digital Electronics

Total Marks : 70

Q.1 Choose the correct answer **[10]**

1. Which type of error is said to be human error ?
   (a) Gross error (b) Random Error (c) Systematic error
2. The Probable Error r is given by_____.
   (a) 0.674σ (b) ± 0.6745 σ (c) 0.6754 σ
3. Subtract 0001_2 from 0100_2_____.
   (a) 011_2 (b) 0101_2 (c) 999_{10}
4. $2C_{16} + 4D_{16}$_____.
   (a) 79_{16} (b) 78_{16} (c) 77_{16}
5. Full form of LSB is_____.
   (a) Least significant bit (b) Least significant byte (c) Least significant digit
6. Decoding means the conversion from _____.
   (a) Binary to Decimal (b) Decimal to Binary (c) Decimal to Hexadecimal
7. The Universal building blocks are _____.
   (a) AND & OR (b) NAND & NOR (c) AND & NAND
8. Demorgan's theorem is break the line _____.
   (a) Change the number (b) Change the sign (c) Complement the output
9. Add $1010_2 + 0011_2$=_____.
   (a) 1101_2 (b) 1000_2 (c) 1100_2
10. The full form of CRT is _____.
    (a) Cathode Ray tube (b) Cathode Ray Oscilloscope
    (c) Cathode Ray time

Q.2 Answer any TEN questions in brief **[20]**

1. Define Accuracy and Resolution.
2. List the blocks of CRO.
3. List the radix for each number system.
4. What is positive zero and negative zero?
5. What do you mean by reflective code? Write two reflective codes.
6. List the steps to perform BCD addition.
7. What is Boolean algebra?
8. Draw the K map for two variables.
9. Prove $A + \bar{A}B = A + B$.
10. Draw the truth table and logic symbol of two input NOR gate.
11. Convert 1101_2 binary number to gray code.
12. Express the decimal number -16,000 in 16-bit Two's complement form.

(P.T.O)

Q.3 Explain different types of errors in detail. [10]

OR

Q.3 Explain CRT in detail with necessary diagram. [10]

Q.4 (a) Multiply 1010_2 by 1011_2 using computer method. [05]
(b) Add -17 and -15 in 2's complement form. [03]
(c) Add -4 and $+7$ in 1's complement form. [02]

OR

Q.4 (a) Divide 0010 1011 by 0110 using computer method. [05]
(b) What negative value does 1001 1011 represents? [03]
(c) Add +3 to -2 in 1's complement form. [02]

Q.5 (a) Explain the weighted and non weighted binary codes in detail. [07]
(b) Subtract 175 from 267 in XS3 code. [03]

OR

Q.5 (a) Add 247.6 to 359.4 in XS3 code. [04]
(b) Add 547 and 999 in BCD form. [03]
(c) Convert Gray code 1110111 to Binary. [03]

Q.6 (a) Find the POS and SOP form of $y=\sum m(0,1,3,6,7,8,9,13,15)$. [07]
(b) Discuss in detail Universal building blocks. [03]

OR

Q.6 (a) Explain Demorgan's Theorems in detail with necessary diagram. [07]

(b) Find the SOP form of $F=\sum m(0,1,2,3,6,7,13,15)$ and implement in NAND logic. [03]

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