

B.Sc. - I (Information Technology) (CBCS Pattern) Semester-I
UBITT105.1 - Elective-I - Paper-V - Digital Electronics

P. Pages : 2

Time : Three Hours



GUG/S/25/10915

Max. Marks : 80

- Notes :
1. All questions are compulsory and carry equal marks.
 2. Draw neat and labelled diagram and use supporting data wherever necessary.
 3. Avoid vague answer and write specific answer related to question.

Either:

1. a) Explain Hexadecimal number system and convert the following into its equivalent. 8
- i) $(16)_{16} = (?)_{10}$
 - ii) $(38)_{16} = (?)_{10}$
- b) State any four binary codes and explain each of them briefly. 8

OR

- c) What is Excess-3 Code? Explain with example & perform the following Excess-3 addition. 8
- i) $19+21$
 - ii) $64+78$
- d) Convert the following. 8
- i) $(2BC)_{16} = (?)_8$
 - ii) $(0.145)_{10} = (?)_2$

Either:

2. a) What is Logic gate? Give the construction of EX-OR gate by using NOR gate. 8
- b) Perform the binary Arithmetic 8
- i) $(101010101)_2 / (1010)_2$
 - ii) $(10101)_2 \times (1011)_2$

OR

- c) Explain how derived gate can be constructed by using universal gate. 8
- d) Explain binary addition and subtraction with suitable example. 8

Either:

3. a) State and prove DeMorgan's theorem for three variable. 8
- b) Minimize the following logical equation using k-map 8
- $f(a, b, c, d) = \sum m(2, 4, 8, 6, 9, 10, 11, 14)$
- $f(a, b, c) = \pi M(4, 6, 7)$

OR

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|------|--|---------------------|
| c) | Describe the following Boolean law's | 8 |
| i) | And law | ii) OR law |
| iii) | Associative law | iv) Commutative law |
| d) | What is subtractor? Explain Half subtractor circuit in detail. | 8 |

Either:

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|----|----|--|---|
| 4. | a) | Draw a block diagram of 3-bit ripple counter? Explain it's construction and working. | 8 |
| | b) | Differentiate between Asynchronous and synchronous counter. | 8 |

OR

- | | | |
|----|--|---|
| c) | What is Race-around condition? Explain how is it overcome using JKMS FF. | 8 |
| d) | What is Ring counter? Explain. | 8 |

5. Solve all the questions.

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|----|---|---|
| a) | Describe in brief about Real number Representation. | 4 |
| b) | Draw and give truth table of Basic gates. | 4 |
| c) | What is multiplexer? Draw 4:1 MUX. | 4 |
| d) | Explain D-flipflop in detail. | 4 |
