

B.C.A.- I CBCS Pattern Semester-I
UBCAT105.1 - Elective-I - Paper-V : Digital Electronics

P. Pages : 2

Time : Three Hours



GUG/W/23/11747

Max. Marks : 80

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

Either:

1. a) Explain Octal number system with their valid and invalid number system. 8
Convert following.
i) $(16)_8 = (?)_{10}$
ii) $(63)_8 = ()_{10}$
- b) Write note on. 8
i) Range ii) Accuracy
iii) Underflow iv) Overflow

OR

- c) Explain the following. 8
i) Excess-3 code.
ii) Gray code.
- d) Write down steps to convert octal number system to Hexadecimal system. 8
Convert the following.
i) $(125)_8 = (?)_{16}$
ii) $(17)_8 = (?)_{16}$

Either:

2. a) Explain Binary Addition and subtraction in detail with suitable example. 8
- b) Solve the following by using 1's complement method. 8
i) $9 - 7$ ii) $8 - 6$
iii) $(10011)_2 - (00111)_2$ iv) $(11001)_2 - (1110)_2$

OR

- c) What is logic gate? Explain derived gates in brief. 8
- d) Explain the method of 9's complement subtraction. 8

Either:

3. a) What is K-map? Explain the different terms associated with K-map. **8**
b) State the prove DeMorgan's theorem for 3 variable. **8**

OR

- c) Solve using DeMorgan's Theorem. **8**
i) $y = \overline{A \cdot B \cdot C \cdot D}$
ii) $y = \overline{(A \cdot B + C)} + \overline{(A + B)}$
d) Give the construction and working of 8:1 mux by using 4:1 mux. **8**

Either:

4. a) Differentiate between synchronous and asynchronous counter. **8**
b) Write construction and working of Asynchronous Mod-7 counter with their timing diagram. **8**

OR

- c) Explain Ring counter and Johnson counter. **8**
d) Give the short note on. **8**
i) Edge triggered Flip-Flop.
ii) Race Around condition.

5. Solve all the questions.
a) Explain BCD code with example. **4**
b) What is adder circuit? Explain Half adder in detail. **4**
c) What is Demultiplexer? Explain 1:4 demux. **4**
d) What is Flip-Flop? Explain D-Flip Flop. **4**
