Roll No…….. **Total No. of Printed Pages: [01]**
Total No. of Questions: [09]

B.Sc. (IT) (Semester – 2nd)
FUNDAMENTAL DIGITAL ELECTRONICS
Subject Code: BITE1-206
Paper ID: [130409]

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(2 marks each)**

Q1. Attempt the following:

a. Perform $(34)_{10}$ - $(13)_{10}$ by using 2's complement method.
b. What is the function of Half- adder?
c. What are the first five decimal digits in base 4?
d. State De-Morgan's second Theorem.
e. Compare latch and flip flop.
f. Why don't care conditions are required?
g. How combinational circuits are different from sequential circuits?
h. What is the disadvantage of J-K flip flop?
i. What are the applications of counters?
j. Realize the NAND gate using NOR gates only.

Section – B **(5 marks each)**

Q2. Draw the logic diagram of Master Slave J-K flip flop. Explain it in detail.

Q3. What is gate? Discuss various elements and functions of logic gates by taking suitable examples.

Q4. Implement the following Boolean function using 3:8 decoder and external gates.
F (A,B, C)=Σm(2,4,5,7)

Q5. Find the value of x in the following:
(a) $(111100011.0111)_2 = (x)_{10}$ (b) $(275)_{10} = (x)_2$
(c) $(706.23)_{10} = (x)_8$ (d) $(6327.4051)_8 = (x)_{16}$
(e) $(365)_x = (194)_{10}$

Q6. Explain clock pulse generator using 555 Timer as Multivibrator.

Section – C **(10 marks each)**

Q7. Implement the following Boolean function using 8:1 multiplexer
F(A,B,C,D) = Σm (2,4,5,7,10,14)

Q8. Design a Binary Adder/Subtractor circuit by using logic gates and explain it in detail.

Q9. Design a 3-bit, Asynchronous down counter.