

POSSESSION OF MOBILE IN EXAMINATION IS UFM PRACTICE

Name of Student -----

Enrolment No. -----

Department -----

BENNETT UNIVERSITY, GREATER NOIDA

Supplementary Examination, August 2018

COURSE CODE: **ECSE104L**

MAX. DURATION: **TWO HOUR**

COURSE NAME: **DIGITAL DESIGN**

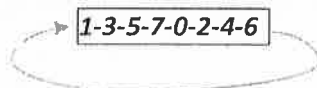
COURSE CREDIT: **5**

MAX. MARKS: **50**

Note:

- All the questions are compulsory.
- Please write precisely and neatly. Please make clear diagram wherever required.

1. Design an adder and 1's complement subtractor in a single unit. The beauty of the unit is that same unit has the capability to perform addition and subtraction based on the given input. (10 Marks)
2. Design a 8-to-1-multiplexer using 2-to-1 multiplexer. (5 Marks)
3. Design the synchronous counter using T flip flop which count numbers as follows: (10 Marks)



Please give details of the following steps:

- a. Develop state diagram
 - b. Create excitation table
 - c. Identify function using k maps
 - d. Design counter circuit
4. Write short note on any two: (2*2.5=5 Marks)
 - i. Issues in SR latch.
 - ii. The advantage of D flip-flop over S-R flip-flop.
 - iii. Difference between edge trigger and level trigger
 5. Simplify the following Boolean expressions/minterms using the K-map. (10 marks)
 - a) $F = AB'C + A'BC'D + AB'CD' + A'B'C'D$
 - b) $F = (1, 2, 5, 8, 9, 10, 12)$
 6. Multiple choice questions. (5*2=10 marks)
 - i. What is the result when a decimal 5238 is converted to base 16?
 - a. 1388
 - b. 12166
 - c. 327.375
 - d. 1476

ii. Which combinational circuit is renowned for selecting a single input from multiple inputs & directing the binary information to output line?

- (a) Multiplexer
- (b) Demultiplexer
- (c) Both a and b
- (d) None of the above

iii. Consider the following Boolean expression for F:

$$F(A, B, C, D) = AB + A'BC + A'BC'D$$

The minimal sum-of-products form of F is

- a. $AB + BC + CD$
- b. $A + B + C + D$
- c. $A' + B' + C' + D'$
- d. $A'B + A'C'S + A$

iv. In an SR latch made by cross-coupling two NAND gates, if both S and R inputs are set to 1, then it will result in

- a. $Q = 0, Q' = 1$
- b. $Q = 1, Q' = 0$
- c. Memory
- d. Not allowed

v. Equation of carry in full adder is (a, b are inputs, and c is carry input).

- a. $\text{carry} = ab + bc + ca$
- b. $\text{carry} = ab + (a \oplus b) c$
- c. Both a and b
- d. None of the above