3 Yr. Degree/4 Yr. Honours 1st Semester Examination, 2023 (CCFUP)

Subject : Computer Science

Course: COMP1011 (MAJOR)

(Computer Fundamental & Digital Logic)

Time: 2 Hours **Full Marks: 40**

The figures in the right hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

1. Answer *any five* of the following questions: 2×5=10

(a) What is Flow Chart?

(b) Define Pseudo Code.

(c) State De Morgan's Theorem.

(d) Why NAND Gate is called Universal Gate?

(e) Define Latch.

(f) What do you mean by sequential circuit?

(g) Write the difference between Parity Generator and Parity Checker.

(h) What is Decision Table?

2. Answer *any two* of the following questions: 5×2=10

(a) What do you mean by Computer Programming Language? Discuss in brief Machine and Assembly Language. 1+2+2

(b) What is Gray Code? Write steps to convert Binary to Gray Code. Convert $(100110)_2$ to Gray Code. 2+2+1

(c) Discuss S–R and J–K Flip Flop with diagram and Truth Table. 2.5+2.5

(d) Design a four bit shift register with parallel load. 5

3. Answer *any two* of the following questions: 10×2=20

(a) (i) Simplify the following Boolean expression using 4 variable K-Map.

$f(A,B,C,D) = \sum m\ (2,3,6,7,8,10,13,15)$

(ii) Write the drawbacks of K-map. 8+2

(b) What do you mean by Decoder? Design a 4×16 decoder using 3×8 decoders and any additional logic gates. 2+8

(c) What is the difference between Synchronous and Asynchronous Counter? Design a 3 bit Asynchronous Up / Down Counter. 2+8

(d) Write shorts note on *any two* : 5×2=10

(i) ASCII

(ii) Single Error Detecting and Correcting Codes

(iii) Master–Slave J–K Flip Flop

(iv) Ripple Counter
