(c) (i) Discuss different types of programming languages.

(ii) What is Gray code? Convert $(01001)_2$ to its equivalent Gray code. 6+2+2

(d) Write short notes on *any two*: 5+5

(i) Comparator circuit (2 bit)

(ii) Master slave J–K Flip Flop

(iii) Binary Coded Decimal (BCD)

(iv) Johson's counter

COMP1011

3 Yr. Degree/4 Yr. Honours 1st Semester Examination, 2024 (CCFUP)

Subject : Computer Science

Course: COMP1011 (MAJOR)

(Computer Fundamentals and Digital Logic)

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

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

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

(a) What is Mini Computer?

(b) Convert $(745)_8$ to Hexadecimal Number System.

(c) Why NOR Gate is called Universal Gate?

(d) Write the difference between Minterm and Maxterm.

(e) Write two disadvantages of K-Map.

(f) What is weighted code?

(g) What do you mean by sequential circuit?

(h) What is race around condition?

2. Answer *any two* questions: 5×2=10

(a) Simplify the following Boolean expression using K-map.

$f(A, B, C) = \Sigma m(1, 3, 5, 6, 7)$.

(b) (i) Design a full adder circuit with the help of half adders and logic gate.

(ii) What is BCD Adder? 3+2

(c) (i) Construct a 16×1 MUX using 8×1 MUX and logic gates.

(ii) What do you mean by parity bit? 4+1

(d) Discuss a single bit error detection and corrections code.

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

(a) Design mod 7 counter using T Flip Flop. 10

(b) (i) Explain clocked SR Flip Flop using NAND Gate and using NOR Gate.

(ii) What is Excitation table? 8+2