OR

(b) What is an instruction cycle ? Explain flowchart for instruction cycle with the time executed at each step of the cycle. (CO1)

4. (a) Write an assembly language program to add and subtract two numbers. (CO2)

OR

(b) Write an assembly language program to perform multiplication and division of two numbers. (CO2)

5. (a) What are subroutines ? Write a program to demonstrate the use of subroutines. (CO2)

OR

(b) What is microprogrammed control ? Draw the block diagram of computer hardware configuration. (CO2)

H Roll No. .....

TBC–304/TBI–304

B. C. A./B. SC. (IT)
(THIRD SEMESTER)
MID SEMESTER
EXAMINATION, Oct., 2023

COMPUTER ORGANIZATION AND ARCHITECTURE

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any ***one*** of the sub-questions.

(ii) Each sub-question carries 10 marks.

1. (a) (i) Explain in brief arithmetic and logical microoperations with examples of each microoperation. (CO1)

(ii) The 8 bit values of registers R1 and R2 are given below. Tell how many opcodes and operands are being used

and what will be the final value stored in register R2.

R1 = 01001111, R2 = 10011101

R2 ← [{(R1 XNOR R2)′ + (R1′ + 1)} ^ (R1′ XOR R2′)′]

OR

(b) (i) Explain in brief shift microoperations with examples of each micro-operation. (CO1)

(ii) The 8 bit values of registers R1 and R2 are given below. Tell how many opcodes and operands are being used and what will be the final content stored in register R1.

R1 = 11101011, R2 = 01011011

R1 ← [{(R1 + 1)′ ∨ (R2′+1)′} XOR (R1 XNOR R2)']

2. (a) (i) What is a bus in terms of computer systems ? Explain in brief bus line with three state buffers. (CO1)

(ii) What will be value of the final content stored in the accumulator AC = 10010111, R1 = 00111011 ?

AC ← {(AC + 1) ∧ (R1′ + 1)′}′

OR

(b) (i) Explain in brief the concept of memory transfer. Describe different computer registers. (CO1)

(ii) What kind of operation is being done below ?

DR ← M [AR], M [AR] ← R1

If R1 = 110011, DR = 10111.

What will be the final value in DR ?

DR ← {(DR′ + 1)′ XNOR (R1′ + 1)}′

3. (a) Tell what kind of memory reference instruction is pointing to : (CO1)

(i) DR ← M [AR], AC ← AC ∧ DR, SC ← 0

(ii) DR ← M [AR], AC ← AC + DR, SC ← 0

(iii) DR ← M [AR], AC ← DR, SC ← 0

(iv) PC ← AC, SC ← 0

(v) M [AR] ← PC, PC ← AR + 1