

## JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

## TEST -3 EXAMINATION- MAY 2018

## B.Tech IV Semester

COURSE CODE: 10B22CI421

MAX. MARKS: 35

COURSE NAME: Computer Organisation

COURSE CREDITS: 04

MAX. TIME: 2 Hrs

*Note: All questions are compulsory. Each question carries equal marks. Carrying of mobile phone during examinations will be treated as case of unfair means.*

1. (a) What are Interrupt Cycle Phases? Draw and explain the common bus with timing clock indicating Register transfers for the Interrupt Cycle.
- The fetch and decode phases of the instruction cycle must be:  
(Replace T<sub>0</sub>, T<sub>1</sub>, T<sub>2</sub> → R'T<sub>0</sub>, R'T<sub>1</sub>, R'T<sub>2</sub> (fetch and decode phases occur at the instruction cycle when R = 0))
  - Interrupt Cycle:
    - RT<sub>0</sub> : AR ← 0, TR ← PC
    - RT<sub>1</sub> : M[AR] ← TR, PC ← 0
    - RT<sub>2</sub> : PC ← PC + 1, IEN ← 0, R ← 0, SC ← 0
- (b) Draw and explain the Complete Computer Description flow chart with Instruction Cycle and Interrupt Cycle.
2. (a) Explain the following Control Functions and Microoperations in tabular form, for the Basic Computer:

(i) Fetch	(ii) Decode
(iii) Indirect	(iv) Interrupt:
(v) Memory-reference	(vi) Register-reference
(vii) Input-output	

- (b) Give the design of Accumulator Logic with:
- a. Circuits associated with AC
  - b. All the statements that change the content of AC
  - c. Gate structures for controlling the LD, INR, and CLR of AC
  - d. Flag connected with the AC.
3. (a) Draw and explain the flow diagram of Second Pass of assembler.
- (b) What are the program loops. WAP to add 100 numbers using basic computer instructions.

4. WAP for multiplication with four significant digits

X = 0000 1111            P  
 Y = 0000 1011    0000 0000  
      0000 1111    0000 1111  
      0001 1110    0010 1101  
      0000 0000    0010 1101  
      0111 1000    1010 0101  
      1010 0101

X holds the multiplicand  
 Y holds the multiplier  
 P holds the product

- (a) Give the algorithm in flow chart
  - (b) Write the assembly code to implement the proposed algorithm
5. (a) Explain the use of Control memory in Microprogrammed Control Organization. How the instructions are mapped in memory?  
 (b) Write the Micro operations for following Instruction Fields:

F1	Microoperation	Symbol
000		NOP
001		ADD
010		CLRAC
011		INCAC
100		DRTAC
101		DRTAR
110		PCTAR
111		WRITE

F2	Microoperation	Symbol
000		NOP
001		SUB
010		OR
011		AND
100		READ
101		ACTDR
110		INCDR
111		PCTDR

F3	Microoperation	Symbol
000		NOP
001		XOR
010		COM
011		SHL
100		SHR
101		INCPC
110		ARTPC
111		