

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- Feb. 2018

B.Tech IV Semester

COURSE CODE: 10B22CI421

MAX. MARKS: 15

COURSE NAME: Computer Organisation

COURSE CREDITS: 04

MAX. TIME: 1 Hr

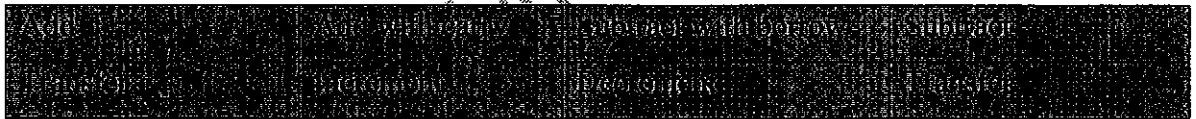
Note: All questions are compulsory. Each question carries equal marks. Carrying of mobile phone during examinations will be treated as case of unfair means.

1. (a) Implement the following Boolean function using 8X1 MUX.

$$F(A, B, C, D) = \sum (1, 3, 4, 11, 12, 13, 14, 15)$$

- (b) Implement the common bus architecture for 4 bits, 4 registers using three-state buffers and a decoder instead of the multiplexer

2. Design a 4-bit Arithmetic Circuit with Arithmetic Circuit Function Table to implement following Arithmetic Microoperations:



3. (a) Draw the block diagram for the hardware that implements the following statements:

$$x + yz: AR \leftarrow AR + BR$$

where AR and BR are two n-bit registers and x, y, and z are control variables. Include the logic gates for the control function. (Remember that the symbol + designates an OR operation in a control or Boolean function but that it represents an arithmetic plus in a microoperation.)

- (b) A digital computer has a common bus system for 16 registers of 32bits each. The bus is constructed with multiplexers.

- How many selection inputs are there in each multiplexer?
- What size of multiplexers are needed?
- How many multiplexers are there in the bus?