

# COMPUTER SYSTEMS ARCHITECTURE

## Masters in Computer Applications

UPC : 223401104

MCAC-104

Dec 2020

Maximum Marks 70 Time: Three Hours

Attempt any Four questions

All Questions carry Equal Marks

Q1

- a) Realize the expression for full adder with the truth table and logic diagram.
- b) Differentiate between ring counters and Johnson counters.
- c) Explain 3-to-8 line decoder using logic diagram and truth table.
- d) Explain the working of J-K flip flop using its characteristics table and explain the race around condition.
- e) Explain the tri-state logic circuit with its applications.

Q2. Perform the subtraction with the following unsigned decimal numbers by taking the 10's complement of the subtrahend:

a.  $5250 - 1321$

b.  $1753 - 8640$

c.  $20 - 100$

d.  $1200 - 250$

Construct a 16-to-1 line multiplexer using two 8-to-1 line multiplexers and one 2-to-1 line multiplexer. Use block diagrams for the above three multiplexers.

Q3. Explain various types of instruction formats. Write the program in assembly language that evaluates  $X = (A + B) \times (C + D)$ , together with comments that explain the register transfer operations for each instruction format.

Q4. Show the operation of Input-Output Configuration with suitable diagram. Explain the various procedures for handling the priority interrupts.

Q5. Explain the different types of primary and secondary. Memory. What is associative memory? Show its operation using the match logic.

.Q6. Data transfer between the Central Processing Unit and I/O devices may be performed in a variety of modes. What are such different kinds of modes. Explain the DMA mode of data transfer..