



# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

## B.Sc. DEGREE EXAMINATION – COMPUTER SCIENCE

FIRST SEMESTER – NOVEMBER 2023

### UCS 1502 – COMPUTER ORGANIZATION AND ARCHITECTURE

Date: 01-11-2023

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

#### SECTION A - K1 (CO1)

**Answer ALL the Questions**

**(10 x 1 = 10)**

#### 1. Multiple Choice Questions

- a) \_\_\_\_\_ is used to store one bit of data  
a) Flipflop                      b) Decoder                      c) Encoder                      d) Register
- b) \_\_\_\_\_ memory is used to speed up the computer processing  
a) Virtual                      b) Cache                      c) Random access                      d) Read only
- c) The address in the main memory is known as \_\_\_\_\_  
a) Logical address                      b) Physical address                      c) Memory address                      d) None of the above
- d) Which of the following is a combinational logic circuit, which sends data from two or more inputs to single destination?  
a. Multiplexer                      b) Demultiplexer                      c) Encoder                      d) Decoder
- e) The addressing mode used in an instruction of the form ADD X Y, is  
(A) Absolute                      (B) indirect                      (C) index                      (D) none of these

#### 2. Answer the following

- a) Define Encoder.
- b) State DeMorgan's theorem.
- c) What is known as Indirect address?
- d) List any four Register reference instructions.
- e) Give examples for zero address instructions.

#### SECTION A - K2 (CO1)

**Answer ALL the Questions**

**(10 x 1 = 10)**

#### 3. True or False

- a) SR flip flop is constructed with two NOR gates and only one AND gate.
- b) The combinational circuit that change the n bit binary information to  $2^n$  output lines is known as decoder
- c) The Program counter has 16 bits address and it holds the address of the next instruction to be executed.
- d) The BSA instruction performs the function referred to as subroutine call.
- e) Status bit is also called as flag bits

#### 4. Fill in the blanks

- a) The quad in the K-Map reduces \_\_\_\_\_ number of variables.
- b) A register capable of shifting both right and left is known as \_\_\_\_\_
- c) An \_\_\_\_\_ is a group of bits that instruct the computer to perform a specific operation
- d) The \_\_\_\_\_ instruction transfers the memory word specified by the effective address to accumulator

e)	In _____ mode, the operands are implicitly specified in the definition of the instruction
<b>SECTION B - K3 (CO2)</b>	
<b>Answer any TWO of the following (2 x 10 = 20)</b>	
5.	Solve the following function by using map method $F(w,x,y,z) = \Sigma(1,3,7,11,15)$ $D(w,x,y,z) = \Sigma(0,2,5)$
6.	Describe in detail about the JK flip flop with a neat diagram.
7.	How the Octal to binary converter is implemented using encoder? Explain
8.	Discuss the usage of Bidirectional Shift registers and its types.
<b>SECTION C – K4 (CO3)</b>	
<b>Answer any TWO of the following (2 x 10 = 20)</b>	
9.	Describe in detail about the different types of Instructions available in memory.
10.	Explain the applications of Logic micro operations with examples.
11.	Analyse the instructions involved in Shift micro operations.
12.	Make use of flowchart to describe the memory reference instructions.
<b>SECTION D – K5 (CO4)</b>	
<b>Answer any ONE of the following (1 x 20 = 20)</b>	
13.	What is known as Multiplexer? Implement the following Boolean function using Multiplexer. $F(A,B,C) = \Sigma(1,3,5,6)$
14.	Define Interrupt. Summarize the various types of Interrupts.
<b>SECTION E – K6 (CO5)</b>	
<b>Answer any ONE of the following (1 x 20 = 20)</b>	
15.	Build the phases involved in Instruction Cycle.
16.	Write the various types of addressing modes with examples.

&&&&&&&&&&