



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – COMPUTER SCIENCE

FIRST SEMESTER – APRIL 2022

UCS 1502 – COMPUTER ORGANIZATION AND ARCHITECTURE

(21 BATCH ONLY)

Date: 24-06-2022

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

SECTION A

Answer ALL the Questions

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1.	Define	(5 x 1 = 5 Marks)	
a)	Define Multiplexer.	K1	CO1
b)	Mention the advantage of EPROM.	K1	CO1
c)	Give an example for Instruction code.	K1	CO1
d)	State the major difference between instruction cycle and interrupt cycle.	K1	CO1
e)	List out any four addressing modes.	K1	CO1
2.	Multiple Choice Questions	(5 x 1 = 5 Marks)	
a)	How many AND gates are required for a half - adder circuit? i) 3 ii) 1 iii) 2 iv) 4	K1	CO1
b)	Instruction code is a i) byte to instruct computer to do a specific operation ii) bit to instruct computer to do a specific operation iii) byte to define an operation iv) bit to define an operation	K1	CO1
c)	The two important phases of an instruction cycle are i) Bit and byte ii) Register and Counter iii) Fetch and Decode iv) Interrupt and return	K1	CO1
d)	Which IC is suitable for low power consumption systems? i) SSI ii) MSI iii) MOS iv) ECL	K1	CO1
e)	Status bits are also known as i) Flag bits ii) Position bits iii) Location bits iv) Standard bits	K1	CO1
3.	Fill in the blanks	(5 x 1 = 5 Marks)	
a)	J K flip flop is refinement of _____.	K2	CO1
b)	An encoder performs the inverse operation of _____.	K2	CO1
c)	The Program Counter is meant for _____.	K2	CO1

d)	An interrupt cycle is _____.	K2	CO1
e)	$AC \leftarrow M[ADR]$ is _____ address mode.	K2	CO1
4.	State True/False	(5 x 1 = 5 Marks)	
a)	Instruction code means _____ byte to instruct computer to do a specific operation	K2	CO1
b)	The Address of the next instruction to be executed is stored in address Register	K2	CO1
c)	BSA instruction is Branch and save instruction.	K2	CO1
d)	In I/O reference instructions the left most 4 bits always 1001.	K2	CO1
e)	A stack organized computer uses the instruction of three Addressing	K2	CO1

SECTION B

Answer any TWO of the following in 150 words				(2x 10 = 20 Marks)	
5.	Explain logic gates with suitable logical diagrams and truth tables.	K3	CO2		
6.	Illustrate the Instruction fetch cycle with a flow chart.	K3	CO2		
7.	Discuss the design of different Decoders.	K3	CO2		
8.	Classify Register Reference Instructions and Memory Reference Instructions.	K3	CO2		

SECTION C

Answer any TWO of the following in 150 words				(2 x 10 = 20 Marks)	
9.	Evaluate the design of various flip-flops.	K4	CO3		
10.	Analyse the usefulness of status bit conditions in a computer system.	K4	CO3		
11.	Discuss the various types of addressing modes with suitable examples.	K4	CO3		
12.	Articulate the design of a common bus system with neat diagram.	K4	CO3		

SECTION D

Answer any ONE of the following in 250 words				(1 x 20 = 20 Marks)	
13.	Apply the logic to design a register to hold a four-bit value. Draw the necessary diagrams for different types.	K5	CO4		
14.	Organize the different data manipulation instructions in detailed manner.	K5	CO4		

SECTION E

Answer any ONE of the following in 250 words				(1 x 20 = 20 Marks)	
15.	Construct K-map and design logical diagrams for the following functions: $F(p,q) = (0,1)$ $d(i,j) = (2,3)$ $F(x,y,z) = (0,1,2,3, 5,6)$ $F(a,b,c,d) = (0, 1, 2, 5,6,11,15)$	K6	CO5		
16.	Construct the Bi-directional shift register with Parallel load with neat diagram and explain it.	K6	CO5		
