

**SVKM'S NMIMS**  
**MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT & ENGINEERING/**  
**SCHOOL OF TECHNOLOGY MANAGEMENT**

Academic Year: 2023-2024

Program/s: B TECH / MBA TECH / B. Tech Integrated

Year: II/IV Semester: IV /VIII

Stream/s : IT/Comp Engg/CSE CS

Subject: Computer Organization and Architecture

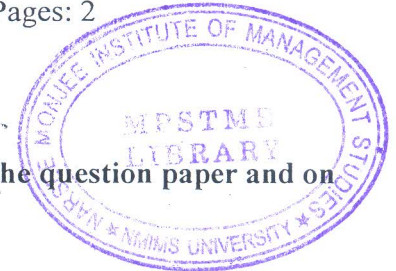
Time: 03 hrs (10:00am to 1:00pm)

Date: 25 / 4 / 2024

No. of Pages: 2

Marks: 100

**Final Examination/ Re-examination(2022-23)**



**Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.**

- 1) Question No. 1 is compulsory.
- 2) Out of remaining questions, attempt any 4 questions.
- 3) **In all 5 questions to be attempted.**
- 4) All questions carry equal marks.
- 5) **Answer to each new question to be started on a fresh page.**
- 6) **Figures in brackets on the right hand side indicate full marks.**
- 7) **Assume Suitable data if necessary.**

<b>Q1</b>		Answer briefly:	
CO1 SO1,2 BL3	a.	Describe the functional components of computer.	[5]
CO2 SO1,2 BL-1	b.	Define any five elements of cache design.	[5]
CO2 SO1,2 BL-2	c.	Explain memory hierarchy in brief.	[5]
CO3 SO1,2 BL-2,3	d.	Sketch and explain combinational circuit based ALU.	[5]
<b>Q2</b> CO1 SO1,2 BL-1,2	a.	What are the different types of system buses? Explain Bus hierarchy in brief.	[10]
CO2 SO1,2 BL5	b.	Consider a direct mapped cache of size 16 KB with block size 256 bytes. The size of main memory is 128 KB. Find 1. Number of bits in tag 2. Tag directory size	[10]

<b>Q3</b> CO3 SO1,2 BL-2	a.	Discuss the Hardwired control unit with suitable diagram.	[10]
CO3 SO1,2 BL-3,5	b.	Draw the flowchart of Booth's algorithm. Evaluate $(+7) * (+3)$ using Booth's algorithm.	[10]
<b>Q4</b> CO2 SO1,2 BL-2	a.	Describe functioning of Associative memory with its associated register.	[10]
CO4 SO1 BL1,2	b.	Explain how super-scalar processor helps in parallel computing. Describe the process with neat diagram.	[10]
<b>Q5</b> CO3 SO1,2 BL-1,5	a.	How do we represent the floating-point number in IEEE 754 format? Represent the number "263.3" in single precision format and double precision format.	[10]
CO3 SO1,2 BL-2,3	b.	Draw the instruction cycle and explain along with various registers involved in it.	[10]
<b>Q6</b> CO4 SO1,2 BL-2	a.	Describe the concept of Interrupt Driven I/O and its role in improving system performance.	[10]
CO1 SO1,2 BL-1,2	b.	What is Bus arbitration technique ? Explain any one arbitration method in detail.	[10]
<b>Q7</b> CO3,4 SO1,2 BL-2	a.	Discuss the following in brief 1. Graphics Processing Unit (GPU) 2. Direct Memory Access (DMA)	[10]
CO2 SO1,2 BL-2,3	b.	Draw and explain the architecture diagram of 8086 microprocessor	[10]