Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 11 – 12- 2025 **Time:** 09:30am – 12:30pm

School: SOCSE	**Program:** Common to all branches
Course Code: CSE2257	**Course Name:** Computer Organization and Architecture
Semester: III	**Max Marks**: 100 **Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**
Marks	**43**	**42**	**43**	**42**

Instructions:

(i) Read all questions carefully and answer accordingly.
(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	State two examples of secondary storage devices	**2 Marks**	**L1**	**CO1**
2.	List the types of a bus.	**2 Marks**	**L1**	**CO1**
3.	Represent -4 in sign and magnitude and 2's complement, 8 bit representation.	**2 Marks**	**L2**	**CO1**
4.	List any four types of addressing modes.	**2 Marks**	**L1**	**CO2**
5.	State the difference between SRAM and DRAM.	**2 Marks**	**L1**	**CO2**
6.	Write the disadvantage of Ripple Carry Adder	**2 Marks**	**L3**	**CO3**
7.	What is meant by quotient and remainder registers in division hardware?	**2 Marks**	**L1**	**CO3**
8.	Predict the number of gate delays are required to compute all sums in a 4-bit Carry Look-Ahead Adder.	**2 Marks**	**L2**	**CO3**
9.	Define fetch phase and execution phase.	**2 Marks**	**L1**	**CO4**
10.	Identify the role of the Memory Address Register	**2 Marks**	**L2**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Illustrate the data flow between memory and processor using an example.	**10 Marks**	**L2**	**CO1**
	b.	Construct a table showing the differences between sign-and-magnitude, 1’s complement, and 2’s complement representations.	**10 Marks**	**L3**	**CO1**
		Or			
12.	**a.**	Compare the four basic instruction types. Evaluate Y= (A+B) * (C+D) using all the basic instruction types.	**10 Marks**	**L2**	**CO1**
	b.	Evaluate the factors that affect the overall performance of a computer system.	**10 Marks**	**L4**	**CO1**

13.	**a.**	Illustrate the operation of immediate, register, and direct addressing modes with suitable examples.	**10 Marks**	**L2**	**CO2**
	b.	Explain with diagrams how PUSH and POP operations are implemented in assembly language.	**10 Marks**	**L2**	**CO2**
		Or			
14.	**a.**	Explain the different types of read only memories and explain the internal organization of 16*8 memory chip with neat diagram.	**10 Marks**	**L2**	**CO2**
	b.	Explain static RAM and dynamic RAM with necessary diagrams.	**10 Marks**	**L2**	**CO2**

15.	**a.**	Deduce Booths multiplication algorithm with the multiplicand 10111 and multiplier 10011.	**10 Marks**	**L4**	**CO3**
	b.	Explain the various I/O communication techniques used in computer systems and compare their advantages and disadvantages.	**10 Marks**	**L2**	**CO3**
		Or			
16.	**a.**	Deduce a schematic representation showing how the CPU, DMA controller, memory, and I/O devices interact during a DMA transfer.	**10 Marks**	**L4**	**CO3**
	b.	Explain the working of a 4-bit Carry Look-Ahead Adder with neat diagrams and derive carry equations up to C4.	**10 Marks**	**L2**	**CO3**

17.	**a.**	Illustrate with a neat diagram the single-bus organization of a CPU, and describe the function of key registers involved.	**10 Marks**	**L2**	**CO4**
	b.	Examine the control sequence for the instruction ADD R1, R2, R3, and explain the role of ALU and control signals.	**10 Marks**	**L3**	**CO4**
		Or			
18.	**a.**	Write the advantages of parallel data transfers in a three-bus structure.	**10 Marks**	**L3**	**CO4**
	b.	Develop a four-stage instruction pipeline diagram and determine the total number of cycles for four instructions.	**10 Marks**	**L3**	**CO4**