

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS

II–B.TECH–I–Semester End Examinations (Supply) – June - 2025

COMPUTER ORGANIZATION AND ARCHITECTURE

(Common to CSE, IT, CSC & CSM)

[Time: 3 Hours]

[Max. Marks: 70]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(20 Marks)

1. a) Draw the basic functional units of computer. [2M]
- b) What is bus? What are the different types of buses in a cpu? [2M]
- c) What is a branch field? [2M]
- d) What is reverse polish notation? Give an example. [2M]
- e) Obtain the 9's complement of 12349876. [2M]
- f) Explain the floating point representation with an example [2M]
- g) List the difference between static RAM and dynamic RAM. [2M]
- h) Define Virtual memory. [2M]
- i) What is parallel processing? [2M]
- j) What do you mean by vector interrupt? Explain. [2M]

PART-B

(50 Marks)

2. Describe the Arithmetic Logic shift unit with neat diagram. Explain its working with an example. [10M]

OR

- 3.a) Draw the block diagram for the hardware that implements the following statements [5M]
 $x+y: AR \leftarrow AR+BR$
 where AR and BR are two n-bit registers and x,y and z are control variables. Include the logic gates for the control function.
- b) Using a 4-bit counter with parallel load and a 4-bit adder, draw a block diagram that shows how to implement the following statements: [5M]
 $x: R1 \leftarrow R1+R2$ Add R2 to R1
 $x'y: R1 \leftarrow R1+1$ Increment R1 where R1 is a counter with parallel load and R2 is a 4-bit register.

4. What is an addressing mode? Explain any four types of addressing modes, with suitable examples. [10M]

OR

- 5.a) Describe the conditional branching with block diagram [5M]
- b) Explain the computer hardware configuration with neat diagram [5M]
6. Explain steps to perform the arithmetic operations of $(+42) + (-13)$ and $(-42) - (-13)$ in binary using signed-2's complement representation for negative numbers. Draw the flow chart for it. [10M]

OR

- 7.a) Draw the Flow chart of add and subtract operations. [6M]
- b) Write the algorithm for adding and subtracting numbers in signed-2's complement representation. [4M]

8. Discuss the Memory Hierarchy in computer system with regard to Speed, Size and Cost. [10M]

OR

9. Explain the following. [5M]

- a) Auxiliary Memory. [5M]
- b) Associative Memory.

10.a) Describe RISC and CISC characteristics. [5M]

b) Demonstrate the solution for Cache Coherence. [5M]

OR

11. Discuss the implementation of Instruction pipeline with an example. [10M]
