

Roll No																			
---------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



**PRESIDENCY UNIVERSITY
BENGALURU**

SET B

**SCHOOL OF ENGINEERING
END TERM EXAMINATION - JAN 2024**

Semester : Semester III - 2022

Course Code : CSE2009

Course Name : Computer Organization and Architecture

Program : B.Tech.

Date : 04-JAN-2024

Time : 9:30AM - 12:30 PM

Max Marks : 100

Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.*
 - (ii) Question paper consists of 3 parts.*
 - (iii) Scientific and non-programmable calculator are permitted.*
 - (iv) Do not write any information on the question paper other than Roll Number.*
-

PART A

ANSWER ALL THE QUESTIONS

4 X 5M = 20M

1. In a system with a word length of 32-bits, Illustrate the representation of the word 'BHARGAVI' in big-endian and little-endian storage formats.

(CO1) [Knowledge]
2. Define Addressing Modes. Explain with an example Auto increment and Auto decrement addressing modes.

(CO1) [Knowledge]
3. Define Interrupt and explain the concept of Interrupt Service Routine (ISR).

(CO2) [Knowledge]
4. Generate and explain the control sequence for execution of the instruction ADD (R2),R1 in a processor using single bus organization.

(CO3) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

5 X 10M = 50M

5. Discuss the factors that affect the performance of the computer. Let a processor operates by a frequency 10MHz and it executes a typical program in which 50% are register referenced instruction, 30% are memory reference instructions and 20% are branch instructions. Register referenced instruction, memory reference instructions and branch instructions take 4, 8 and 6 clock cycles respectively. then find out the total time taken by the processor to execute the program.
(CO1) [Comprehension]
6. In what ways do PROM, EPROM, and EEPROM differ from one another in terms of their characteristics and functionalities within the realm of programmable read-only memory?
(CO1) [Comprehension]
7. In a 32-bit machine, a Stack is used for integer operation. Currently, the stack contains values 32 and 43. Write the instructions to perform the following operations -
Pop the topmost elements of the stack,
Add 45 to the popped element
Push the result to the stack.
Also write the instructions to check for overflow and underflow conditions.
(CO3) [Comprehension]
8. Perform the multiplication on the following signed binary numbers using Booth's Algorithm:
12(Multiplicand) -15(multiplier)
(CO2) [Comprehension]
9. Illustrate the concept of pipelining. Explain the different types of hazards in pipelining.
(CO3) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS

2 X 15M = 30M

10. Consider a cache consisting of 256 blocks of 16 words each, for a total of 4096 words, and assume the main memory is addressable by 16-bit address and it consists of 4K blocks. How many bits are there in each of the Tag, block/set, and word fields for Direct, Associative, and Set-Associative mapping techniques? (2 cache blocks in each set)
(CO3) [Application]
11. Design the flow chart for binary division and Operate '15 divided by 3'. using Restoring Division algorithm.
(CO2) [Application]