

INDIRA UNIVERSITY, PUNE

SCHOOL OF INFORMATION TECHNOLOGY- BCA

Term End Examination (2025 Pattern) December – 2025 - Semester – I

Subject Name: - Computer Organization & Architecture
Subject Code: 25BCA112T

Max. Marks: 25
Time: 1:30 Hrs.

Instructions

- All Questions are Compulsory.

CO #	Cognitive Ability	Course Outcome
CO1	Remember	Recall the basic concepts of number systems & codes, terminology of computer organization, architecture, and system components.
CO3	Apply	Apply knowledge of SOP/POS equations & computer system architecture.
CO4	Analyse	Analyze the performance of different SOP/POS equations and system components.

Q1.	Attempt any 5 out of 7. (1 mark each) a) What is the base of the binary number system? b) What is the Octal code for Binary code (11101) ₂ ? c) What is the truth table of 2 i/p AND gate? d) What is the o/p of 2 i/p's A & B of NAND gate, if i/p B=1 Permanently? e) What is the last count at o/p of MOD-8 down counter before reset the counter? f) List the modes of DMA data transfer? g) Which technique is used for erasing the EPROM chip?	(5 Marks)	CO1
Q2.	Attempt any 2 out of 4. (5 marks each) a) Demonstrate subtraction of (10110) ₂ from (1101) ₂ using 2's complement method and comment on the result. b) Construct the logic circuit diagram with o/p Boolean equations & draw the truth table for Full Adder & Half subtractor. c) Construct & Explain the logic circuit diagram of 4:1 Multiplexer with active high strobe. d) Illustrate how Daisy chaining priority interrupts can be implemented in a system with multiple I/O devices.	(10 Marks)	CO3
Q.3.	Attempt all questions. (5 marks each) a) Examine the significance of 8-bit ASCII code over 7-bit ASCII code b) Examine the difference between Asynchronous & Synchronous Counter	(10 Marks)	CO4

OR

- a) Examine how cache memory improve the performance of CPU and find out the average access time, if 49 times data is available in cache memory out of 50 cache memory references. (Given main memory access time, $t_m = 100\mu\text{sec}$ & cache memory access time, $t_c = 10\mu\text{Sec}$).
- b) Examine how using K-map reduction reduces the number of gates required for a given equation.

$$Y = A' B' C' + A' B' C + A' B C' + A B' C' + A B' C$$

(Here A', B' C' are compliments of respective variables A, B & C).
