



CBCS SCHEME

18EC35

Third Semester B.E. Degree Examination, July/August 2021 Computer Organization and Architecture

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Explain following registers: (i) PC (ii) IR (iii) MAR (06 Marks)
b. Explain how user program and OS routine are sharing processor with printer. (08 Marks)
c. Explain basic performance equation. (06 Marks)
- 2 a. Perform using 2's complement arithmetic: (i) $-5 + (-2)$ (ii) Subtract -5 from -7 (06 Marks)
b. Explain BIG-ENDIAN and LITTLE-ENDIAN assignment. (06 Marks)
c. Illustrate instruction execution and straight line sequencing for the program $C \leftarrow [A] + [B]$.
[Assume that each instruction is 4 byte]. (08 Marks)
- 3 a. List the generic addressing modes with assembler syntax and addressing function. (10 Marks)
b. Explain shift and any two rotate instructions with relevant diagrams. (10 Marks)
- 4 a. Write assembly language program to add 'N' numbers and store the result in 'SUM'.
Assume the following address:
(i) Program should start from '100'.
(ii) 'N' is stored at 204
(iii) Numbers are stored in memory from the address 208. Each number is 4 bytes.
(iv) 'SUM' is stored at 200
(v) Assume each instruction is 4 byte (08 Marks)
b. Explain stack concept with relevant diagrams. (08 Marks)
c. List the steps involved in 'CALL' and 'RETURN' instructions. (04 Marks)
- 5 a. Explain I/O interface for input device and also write the assembly program that reads the one LINE from the keyboard and echoes it back to the display. (10 Marks)
b. Explain methods used for enabling and disabling interrupts. (10 Marks)
- 6 a. Explain daisy chain method used for handling simultaneous interrupt request. (06 Marks)
b. Explain memory mapped I/O access. (06 Marks)
c. Explain use of DMA controller in computer system. (08 Marks)
- 7 a. Calculate number of address lines required to access following memory:
(i) 64 KB (ii) 512 MB (iii) 256 KB (iv) 8 GB (04 Marks)
b. Explain internal organization of $2M \times 8$ dynamic memory chip. (08 Marks)
c. Explain different types of nonvolatile memory. (08 Marks)
- 8 a. Explain cache memory and its relevant terms. (08 Marks)
b. Explain virtual memory organization. (06 Marks)
c. Explain magnetic disk principles. (06 Marks)
- 9 a. Explain single bus organization of the data path inside a processor. (10 Marks)
b. List the steps involved in memory read operation and also draw corresponding timing diagram. (10 Marks)
- 10 a. Write the control sequence for execution of the instruction Add (R_3), R_1 . (06 Marks)
b. Explain block diagram of a complete processor. (06 Marks)
c. Explain micro programmed control concept. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. $42+8=50$, will be treated as malpractice.