PAPER ID—21132

B. Tech. EXAMINATION, 2024

(Fourth Semester)

COMPUTER SCIENCES ENGINEERING

Computer Organization and Architecture

Time : 3 *Hours* *Maximum Marks :* 70

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Section. Q. No. 1 is compulsory. All questions carry equal marks.

1. (a) What is the purpose of using complements in binary arithmetic ?

(b) What are some limitations of simple error detection code ?

(b) Describe the various addressing modes and provide an appropriate example for each. Which addressing mode works best ? Why ? 7

Section C

6. What exactly is instruction pipelining ? What were the disputes that arose during the Pipelining of Instructions ? Draw and describe the four segment instruction pipelining flowchart. 14

7. What exactly is a pipeline hazard ? Discuss many pipeline hazards? Explain in detail, using relevant examples, how to tackle pipeline hazards in pipelining. 14

Section D

8. What exactly is virtual memory ? What is the relationship between address space and memory space in a virtual memory system, as well as the memory table used for mapping ? Also, using examples, explain Virtual Address Mapping using Pages. 14

9. Explain, how DMA bypasses the CPU and speeds up memory operations. A digital computer has one thousand words of cache memory and 64k*16 memory units. The cache uses four-word block size direct mapping : **14**

(i) What is the Cache's maximum block size ?

(ii) How many bits are in the tag, index, block and words fields of the address format ?

(iii) What is the breakdown of bis into functions and how many are there in each cache word ?