

words. Calculate how many bits are required for addressing the main memory ? Also, how many bits are needed to represent the TAG, SET and WORD fields ? 5

(b) Explain the working of a DMA controller with the help of block diagram. What are the various modes of transfer used by DMA ? 10

7. Write short notes on the following : 15

- (a) Priority Interrupts
- (b) Write-back and Write-through policies
- (c) RISC vs. CISC instruction sets
- (d) Hardware interrupts
- (e) Hierarchical memory organization

Roll No. ....

Total Pages : 04

003402

May 2024

B. Tech. (CE/CE(HINDI)/IT/CSE(AIML))

(Fourth Semester)

Computer Organization and Architecture

(PCC-CS-402)

Time : 3 Hours]

[Maximum Marks : 75

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any four questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

**Part A**

1. (a) What do you mean by stored program control concept ? 1.5
- (b) What is program status word ? 1.5
- (c) Explain the concept of Cache Coherence. 1.5
- (d) Differentiate between computer architecture and computer organization. 1.5
- (e) Draw the flowchart explaining the process of non-restoring division algorithm. 1.5

- (f) Bring out the differences between 8085 and 8086 microprocessors. 1.5
- (g) Briefly explain the different I/O interfaces - PCI, SCSI, USB. 1.5
- (h) How can we calculate the speedup and throughput of a system? 1.5
- (i) An instruction is stored at location 200 with address field located at 201. The value of address field is 320. A processor register R1 contains the value 500. Calculate the effective address if the addressing mode is : 1.5
- Direct
  - Relative
  - Register indirect
- (j) What is memory interleaving? How is it useful? 1.5

### Part B

2. (a) Explain Flynn's classification of parallel processors. 5
- (b) Represent the decimal number  $(-262.125)_{10}$  in single precision floating point format. 5
- (c) Explain the ripple carry adder/subtractor using the circuit diagram. 5

3. (a) Explain stack based CPU organization. Use a suitable example to demonstrate the types of instruction formats used in this type of organization? 10
- (b) Obtain the result of multiplying  $(-6)_{10}$  and  $(-9)_{10}$  using booth's multiplier. Draw the flowchart to justify the steps used in obtaining the result. 5
4. (a) What is asynchronous data transfer? Explain any one method used in asynchronous data transfer in detail. 5
- (b) What is micro-programmed control unit? How to obtain address sequencing? 10
5. (a) Explain the 16-bit status/flag register in 8086 microprocessor. If an addition operation is performed on two values - 81 and FE (hexadecimal), what is the resultant value of this register? 5
- (b) What are the various pipeline hazards that are likely to occur in computer architecture? 10
6. (a) A block-set associative cache memory consists of 128 blocks divided into four block sets. The main memory consists of 16,384 blocks and each block contains 256 eight bit