

Total No. of Questions – 8]

[Total No. of Printed Pages – 4

BE-V/12(A)  
232065

36

COMPUTER ENGINEERING

COURSE NO. COM – 506

**( Computer Org. & Architecture )**

Time Allowed: 3 Hours

Maximum Marks: 100

Note: Attempt **five questions** in all selecting at least two questions from each Section. Each question carries 20 **marks**.

**Section – A**

1. (a) What are the three key concepts given by Von Neumann which are being followed for the modern computers?  
(b) What is the function of three basic modules of a computer system? What are the various buses connected to each module for the transfer of data and signals? ( 12, 8 )
2. What is DMA? Explain in detail the whole process of data transfer through DMA. What information is required to be passed on by the Processor the DMA controller for the start of DMA process? Also explain the Cycle Stealing mode of data transfer during DMA.
3. (a) Express the following decimal number in IEEE 32-bit floating point format:  $(384.0625)_{10}$

**[Turn Over**

( 2 )

- (b) Use the Booth's Algorithm to multiply  $(23)_{10}$  (multiplicand) by  $(29)_{10}$  (multiplier) by representing each number by 6-bits.  
( 10, 10 )

4. (a) Explain the following addressing modes:  
(i) Immediate addressing  
(ii) Indirect addressing  
(iii) Indexed addressing ( 10 )
- (b) Define Execution Unit. What is the principle working of EU in a Computer? ( 10 )

### Section – B

5. (a) What is Cache memory? How does it improve the performance of a computer? Explain the 'write through' and 'write back' policies used for cache coherence. ( 10 )
- (b) A block – set-associative cache consists of a total of 128 blocks divided into 8-block sets. The main memory contains 8192 blocks, each consisting of 64 words. Find:  
(i) How many bits are there in the main memory address?  
(ii) How many bits are there in each of the TAG, SET and WORD fields? ( 10 )

( 3 )

6. (a) What are the different concepts used for parallel processing of data?
- (b) Explain the four different board groups into which the parallel processors could be classified. ( 10, 10 )
7. (a) What read, write mechanism is used to store and retrieve the data on magnetic disks? How is the data organized on the magnetic disks? ( 10 )
- (b) Consider a single-platter disk with the following parameters: rotation speed: 7200 rpm; number of tracks on one side of platter: 30,000; number of sectors per track: 600; seek time: one ms for every hundred tracks traversed. Let the disk receive a request to access a random sector on a random track and assume the disk head starts at track 0.
- (i) What is the average seek time?
- (ii) What is the average rotational latency?
- (iii) What is the transfer time for a sector?
- (iv) What is the total average time to satisfy a request?

( 10 )

**[Turn Over]**



( 4 )

8. Write short notes on :

- (a) Optical Memories
- (b) SAP Machines
- (c) Interrupt and Exceptions
- (d) Static Vs Dynamic memories.

( 4 x 5 )

\*\*\*\*\*