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End Term Examination, Odd Semester 2019-20

B. Tech (CSE, CCV, IOT,DA,CSF), II Year, III Sem.

BCSC0005: Computer Organization

Time: 3 Hour Maximum Marks: 50

Section-A

Attempt all questions. 7x5=35 Marks

I. List all the functional blocks of computer system. Describe all with their importance in computer system.

OR

Define Logical gate? List & define basic gates require to design logical circuit. Describe universal gates in brief.

II. A Program residing in the memory unit of the computer consists sequence of instructions. The program is executed in the computer by cycle of each instruction is called instruction cycle. The instruction cycle is subdivided in phases. Explain each phases of Instruction cycle?

III. Draw Instruction format. Why mode filed required in instruction format? Explain any two addressing modes with example.

OR

Explain hardwired control unit with suitable diagram?

IV. 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 words. How many bits are required for addressing the main memory? How many bits are needed to represent the TAG, SET and WORD fields?

V. A microprocessor employs RAM chip of size 512 * 8 and ROM chip of size 1024 * 8. The System required to store 2K bytes in RAM & 1K bytes in ROM to designed Main Memory. What will be the size of Main Memory? How many address lines and data lines are required to access one word from main memory? How many RAM and ROM chips are required with address & data lines? Also specify decoder size required to access RAM memory in this organization?

OR

Draw Memory Pyramid. Explain the difference between various memories on the basis of Storage, Cost per bit, Access Mode & Speed.

VI. Explain DMA controller with DMA transfer with suitable diagram.

VII. Write short notes on:

a) Virtual Memory b) CPU Organization c) Binary Adder

Section-B

I. Attempt all questions. **3 x 2 =6 Marks**

A. Consider a system with 2 level memory. Access times of Main Memory and cache memory are 10 ns and 1 ns, respectively. The hit ratio of cache memory is 60%. What is average access time of the system?

B. IO interface provides a method for transferring information between internal storage and external IO devices. Peripheral connected to a computer need special communication link for interfacing. Special link is to resolve the difference between CPU and each peripheral. Write all the major differences?

C. What is Asynchronous data transfer? Explain strobe control & handshaking method for asynchronous data transfer.

II. Attempt all questions. **3 x 3 =9 Marks**

A. List the names of modes of transfer in IO organization. Explain programmed IO with their drawback?

B. Define locality of reference in terms of cache memory? Explain various scheme to write in cache memory?

C. A system uses three-page frames for storing process pages in main memory. It uses the Least Recently Used (LRU) page replacement policy. Assume that all the page frames are initially empty. What is the total number of page faults that will occur while processing the page reference string given below-?

4, 7, 6, 1, 7, 6, 1, 2, 7, 2

Also calculate the hit ratio and miss ratio.