

**BACHELOR OF TECHNOLOGY (C.B.C.S.) (2021-COURSE)**  
**B. Tech. Sem - I ELECTRICAL :SUMMER- 2022**  
**SUBJECT : COMPUTER ARCHITECTURE & DATA STRUCTURE WITH C**

Day : Friday  
Date : 22-07-2022

**S-24075-2022**

Time : 10:00 AM-01:00 PM  
Max. Marks : 60

**N.B.**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Use of non-programmable calculator is **allowed**.
- 4) Assume suitable data **WHEREVER** necessary.
- 5) Draw neat labeled diagrams **wherever** necessary.

- Q.1** a) Draw and explain basic structure of Computer system. (05)  
b) Discuss in detail the generation of Computer. (05)

**OR**

- Q.1** Define computer system architecture. Describe functions performed by following system components like i) CPU ii) I/O iii) Processor iv) Operating Systems v) I/O Controller. (10)

- Q.2** a) Explain the non-ideal conditions which cause delays in pipeline execution. (05)  
b) A 4 stage pipeline adder is to be designed, the time taken by each pipeline stages are 4 ns, 4 ns, 10 ns and 6 ns. (05)  
i) What should be the clock frequency to derive the adder?  
ii) What is the time taken to add 100 pairs of operands?

**OR**

- Q.2** Explain the following with regards to pipelining concept. (10)  
i) Speed-up ratio  
ii) Frequency of pipelining  
iii) Throughput  
iv) Pipelining efficiency.

- Q.3** a) Draw and explain shared memory multi-processor. (05)  
b) Draw and explain vector architecture in computer organization. (05)

**OR**

- Q.3** Explain in detail Cache memory organization. Also state what is Cache coherence problem. (10)

- Q.4** Explain in detail the concept of Arrays in C. Explain initial values written in one dimensional arrays and illustrate how array declaration differ from Array definition. (10)

**OR**

- Q.4** a) Explain in detail function declaration and variable declaration. (05)  
b) Define : i) Array initialization ii) Array declaration. (05)

- Q.5** a) Describe the ways to specify address of an array element. (05)  
b) Explain the relationship between function name and a pointer. (05)

**OR**

- Q.5** Explain in detail the concept of 'Pointers'. Write short note on Pointer declaration and passing pointers to a function. (10)

- Q.6** a) Explain self-referential structures. Give its syntax and example. (05)  
b) Define a structure. Also write composition of structure. structure declaration. (05)

**OR**

- Q.6** Write short note on : (10)  
i) Stack and Queues  
ii) Unions  
iii) Linked data structure

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