



# BRAINWARE UNIVERSITY

Course – BCA

Computer Architecture & Organization (BCAC203)

(Semester – 2)

**Time allotted: 3 Hours**

**Full Marks: 70**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

## Group –A

(Multiple Choice Type Question)

1. Choose the correct alternatives for the following : (*any ten*) 1 x 10 = 10
- (i) The cache bridges the speed gap between \_\_\_\_\_ and \_\_\_\_\_.
- RAM and ROM
  - RAM and Secondary memory
  - Processor and RAM
  - None of the above
- (ii) For converting virtual address into physical address, the programs are divided into \_\_\_\_\_.
- Pages
  - Frames
  - Segments
  - Blocks
- (iii) Each stage in pipelining should be completed within \_\_\_\_\_ cycle.
- 1
  - 2
  - 3
  - 4
- (iv) The periods of time when the unit is idle is called as \_\_\_\_\_.
- Stalls
  - Bubbles
  - Hazards
  - Both a and b

- (v) The contention for the usage of a hardware device is called as \_\_\_\_\_.  
a) Structural hazard  
b) Stalk  
c) Deadlock  
d) None of the mentioned
- (vi) The situation where in the data of operands are not available is called \_\_\_\_\_.  
a) Data hazard  
b) Stock  
c) Deadlock  
d) Structural hazard
- (vii) Any condition that causes a processor to stall is called as \_\_\_\_\_.  
a) Hazard  
b) Page fault  
c) System error  
d) None of the above
- (viii) The CISC stands for  
a) Computer Instruction Set Compliment  
b) Complete Instruction Set Compliment  
c) Computer Indexed Set Components  
d) Complex Instruction set computer
- (ix) The computer architecture aimed at reducing the time of execution of instructions is \_\_\_\_\_.  
a) CISC  
b) RISC  
c) ISA  
d) ANNA
- (x) Pipelining is a unique feature of \_\_\_\_\_.  
a) RISC  
b) CISC  
c) ISA  
d) IANA
- (xi) The fastest data access is provided using \_\_\_\_\_.  
a) Caches  
b) DRAM's  
c) SRAM's  
d) Registers

**Group – B**

(Short Answer Type Question)

3 x 5 = 15

Answer any *three* of the following

2. a) What is the difference between Computer Architecture and Computer Organization?
- b) Compare Von-Neumann architecture and Harvard architecture [2+3]
3. Write down short notes on Stack Based CPU Organization with proper example. [5]
4. Express the following operation in Zero address instruction format
  - a)  $Y = (A+B)-(C/D)$  [5]
5. Write down the stages of instruction execution cycle. [5]
6. Discuss generations of computer with example. [5]

**Group – C**

(Long Answer Type Question)

3 x 15 = 45

Answer any *three* of the following

7. a) Explain the need of cache memory in computer. [1]
  - b) What are the different types of cache mapping? [1]
  - c) What do you mean by hit and miss w.r.t. cache memory? [2]
  - d) Explain Associative Cache Mapping Techniques with example. [8]
  - e) What is the advantage of Associative cache mapping technique over Direct cache Mapping Technique? [3]
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8. a) What is Virtual Memory? [2]
  - b) Define Logical Address Space. [1]
  - c) What are the different types of techniques used in implementing virtual memory? [2]
  - d) Explain paging with suitable diagram and example. [10]

9. a) Describe the connection between CPU and I/O devices. [5]  
b) Describe the process of programmed I/O with suitable diagram and proper explanation. [10]
10. a) What are the different types of BUS associated with data transfer process? [3]  
b) What is the disadvantage of programmed I/O? [2]  
c) Explain the functions of different types of bus signals used in DMA transfer process. [10]
11. a) What are the functions of control unit in CPU? [3]  
b) What are different types of control unit used in CPU? [2]  
c) Differentiate between Hardwired control unit and Microprogrammed control unit. [10]