বিদ্যাসাগর বিশ্ববিদ্যালয়

# VIDYASAGAR UNIVERSITY

## BCA

## 2nd Semester Examination 2022

## COMPUTER ORGANIZATION AND ARCHITECTURE

### PAPER—1201

*Full Marks :* 100

*Time :* 3 Hours

*The figures in the right-hand margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

### Group – A

Answer any *four* questions.                          4×15

1. (a) What is addressing mode ?

   (b) Explain Base register addressing mode, relative addressing mode and direct addressing mode.

   (c) Explain Booth's algorithm with the help of a flowchart.          2+6+7

**2.** (a) What is the difference between SRAM and DRAM ?

   (b) Explain memory hierarchy with diagram.

   (c) Explain associative mapping with example.

   (d) What are the merits and demerits of associative mapping ?

$$3+4+5+3$$

**3.** (a) What is Pipelining ?

   (b) Explain instruction pipelining.

   (c) Name two RISC and two CISC processors. What are the main characteristics of RISC processors ? Explain the difference between RISC and CISC architecture. $2+5+(2+2+4)$

**4.** (a) What is the difference between computer architecutre and computer organization ?

   (b) What are the two locality principles observed with respect to user programs ? How are these principles exploited in computer design ?

   (c) Explain various data transfer mode between CPU and I/O devices.

   (d) What are the main differences between a multi-processor system and a multi-computer system ?

   (e) In a shared memory system, explain two schemes to maintain cache-coherence. $3+(1+2)+(2+2)+2+3$

**5.** (a) Draw the logic diagram of a 2 of 4 line decoder with NOR gates only.

   (b) Define the terms : Seek time, Rotational delay and Access time in respect to memory.

(c) What are the advantages of virtual memory ? 6+6+3

**6.** (a) Draw the block diagram of a 4-bit arithmetic circuit and deduce the different arithmetic function performed by it.

(b) Can a decoder be a replacement for multiplexer ? State your reason.

(c) What is the advantage of Cache Memory ? 8+4+3

**7.** (a) Design a common bus system for four registers using 4×1 multiplexers and explain how it works.

(b) What are the basic arithmetic micro-operations ? Describe the symbolic designation of micro-operations.

(c) What is binary adder ? Construct a circuit diagram for 4 bit binary adder-subtractor using full adder. 6+4+5

**8.** Write short notes (any three) :

(a) Sequential Circuit.

(b) DMA

(c) Zero address instruction

(d) ALU

(e) Phases of an instruction cycle. 6+4+5

## Group – B

Answer any *one* question. 1×10

**9.** (a) What are the major components of CPU ? Explain how CPU has system directs information flow to perform operation $R1 \leftarrow R2 + R3$.

(b) Write a note on stack organization. 6+4

**10.** (a) Discuss the three modes of transfer to and from peripherals.

(b) What is IOP ? Write a block diagram of a computer with I/O processor.

6+4

*(Internal Assessment : 30)*

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