

POKHARA UNIVERSITY

Level: Bachelor

Semester – Spring

Year:2020

Program: BE

Full Marks: 70

Course: Computer Organization and Architecture

Pass Marks: 31.5

Time: 2 hrs.

Candidates are required to answer in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

Section - A: (5×10=50)

- Q. N. 1 Explain different types of addressing modes used in computer system, along with their usages and application 10

OR

- Write VHDL code for designing a full adder using half adder in structural model. 10
- Q. N. 2 Design 16x4 memory sub-system constructed from 16x2 ROM chips with both low-level and high-level interleaving. 10
- Q. N. 3 Perform -7×-2 using booth's algorithm, Can booth's algorithms be used if both numbers are positive, if yes how? 8+2
- Q. N. 4 What is cache memory? Explain associative, set associative and direct mapping in cache. 2+8
- Q. N. 5 What is instruction pipelining? Explain the data conflicts and branch conflicts along with its remedies. 2+8

Section - B: (1×20=20)

- Q. N. 6 a) For a very simple CPU, has the following instruction set. Show the State diagram, Register Section, ALU design. 10

Operation	Instruction Code	Instruction
$M[AAAAAA] \leftarrow AC$	00AAAAAA	STA
$AC \leftarrow M[AAAAAA]$	01AAAAAA	LDA
$AC \leftarrow AC + 2$	10XXXXXX	INC
$AC \leftarrow AC'$	11 XXXXXX	COM

- b) Why do we need input output modules? Compare programmed I/O, interrupt driven data transfer and Direct memory Access(DMA) 10