

Syllabus

Panjab University

BCA (2nd Semester)

BCA-16-202 Computer Organization

L	T	P	Cr
6	-	-	3

External Marks : 65

Internal Marks : 10

Time Duration : 3 Hrs.

Objectives: This course will enable the student to understand the basic organization of computer system and system maintenance.

Note :

- (i) The Question Paper will consist of Four Sections.
- (ii) Examiner will set total of NINE questions comprising TWO questions from each Section and ONE compulsory question of short answer type covering whole syllabi.
- (iii) The students are required to attempt ONE question from each Section and the Compulsory question.
- (iv) All questions carry equal marks unless specified.

SECTION - A

Computer Organisation : Evolution of Computers, Von Neumann Architecture, Combinatorial Blocks : Gates, Half Adder, Full Adder, Multiplexers, Decoders, Encoders; Sequential Building blocks : Flip Flops, Registers, Counters, Information representation: codes, fixed and floating point representation

Arithmetic: Addition and subtraction for sign magnitude and 2's complement numbers, integer multiplication using Booth's algorithms

SECTION - B

Architecture of a Simple Processor: Architecture of 8086/8088 microprocessor, instruction set, Addressing Modes.

Instruction: Microinstructions: Register Transfer, Arithmetic, Logical and Shift, Types of Instructions, Instruction Cycle.

Interrupt: Types, Interrupt Cycle

I/O organization: Strobe based and Handshake based communication, DMA based data transfer;

SECTION - C

Memory Organisation: Memory Hierarchy, RAM (Static and Dynamic), ROM Associative memory, Cache memory organisation, Virtual memory organisation.

Assembly Language : Features of Assembly Language, Machine Language vs Assembly Language, Pseudo Instruction; use of Assembly for programs: Addition, Subtraction, Multiplication using Subroutines and Basic Input/ Output.

SECTION - D

System Maintenance: Introduction to various physical components of a computer, Physical Inspection and Diagnostics on PC, Functional description of various Internal and External cards; Viruses: Types of Computer Viruses, Detection, prevention and protection from viruses.

Syllabus

Panjab University

BCA (6th Semester)

Paper Code : BCA-202

Paper Title : Computer Organisation

Theory Marks : 90

Number of Lectures : 100

(45 minutes duration)

Objectives: This course will enable the student to understand the basic organization of computer system and system maintenance.

Note :

- (i) The syllabus of this paper has been divided into four sections.
- (ii) Examiner will set total nine questions comprising two questions from each Section and one compulsory question of short answer type covering whole syllabus.
- (iii) The students are required to attempt one question from each Section and the entire Compulsory question.
- (iv) All questions carry equal marks, unless specified.
- (v) The student can use only Non-programmable & Non-storage type Calculator.

SECTION - A

1. Computer Organisation : Evolution of Computers, Stored program concept and Von Neumann Architecture, Information representation and codes, Combinatorial Blocks : Gates, Multiplexers, Decoders, Encoders, Sequential Building blocks : Flip Flops, Registers, Counters, Arithmetic algorithms : Addition and subtraction for signed magnitude and 2's complement numbers, integer multiplication using shift and add, Booth's algorithms, Integer and floating point representation. (No. of Periods : 25)

SECTION - B

2. Architecture of a Simple Processor: An instruction set, Addressing Modes, Instruction formats, Instruction execution in terms of Microinstructions, Concept of interrupt and simple

I/O organisation, I/O organization : Strobe based and Handshake based communication, Vector and priority interrupts, DMA based data transfer; CPU organisation with large registers, Stacks and handling of interrupts and subroutines. Concept of Bus, data movement among registers, data movement from/to memory. (No. of Periods : 25)

SECTION - C

3. Memory Organisation : RAM, Basic cell of static and dynamic RAM, Building large memories using chips, Associative memory, Cache memory organisation, Virtual memory organisation. Assembly Language Programming : Machine and assembly language, Pseudo operations, subroutines in assembly language. Assembly language programs:-To add/subtract two numbers, Program to input/output one character, Program to demonstrate the use of subroutines. Register Transfer Language and micro-operations; Language to represent conditional data transfer, Arithmetic and logical operations along with register transfer. (No. of Periods : 25)

SECTION - D

4. System Maintenance, Physical Inspection of a PC and internal cards, Diagnostics on a PC, Functional description of various modules and cards. *PC Doctor, Norton, Simantac, Steps of Diagnostics.* Viruses, Types of viruses. *Detection, Protection and Cure of Viruses on a PC.* (No. of Periods : 25)

Syllabus

Panjab University

B.A./B.Sc. (4th Semester)

Scheme of Examination

Fourth semester			Exam Hrs.	Ext.	Int.	Max Marks	Lectures per week
Paper - A04	Theory	Computer Organization & Architecture	3	65	10	75	6
Paper- PA04	Practical	Practical Based on Paper-A04	2	25	--	25	6

Note : Practical marks will include the appropriate weightage for proper maintenance of lab. Record.

Paper-A04 : Computer Organization & Architecture

Objective : The course is designed to provide inside details of computer system including processor, memory card & I/O devices and to solve problems using Assembly Language Programming.

Notes : (i) The question paper will consist of four sections and a compulsory questions.

(ii) Examiner will set total of nine questions comprising two questions from each section and one compulsory question of short answer type covering whole syllabi.

(iii) The students are required to attempt one question from each section and the compulsory question.

(iv) All questions carry equal marks unless specified.

SECTION - A

1. Representation of Information : Number system: Binary, Decimal, Hexadecimal, Octal; Conversions; integer and floating point representation, character codes (ASCII, EBCDIC), error detection and correction codes: Parity bit method, Hamming code.

SECTION - B

2. Basic Building Blocks : Boolean algebra, combinatorial logic design : Gates, Half Adder,

Full Adder, Encoder, Decoder, Multiplexer : Sequential Building Block : Flip-Flops, Registers, Counters: Synchronous and Asynchronous Counters, Bus.

3. *Microinstructions* : Register Transfer, Arithmetic, Logical and Shift Operations; Instruction : Instruction Format, Instruction Cycle; Interrupt: Interrupt types, Interrupt Cycle.

SECTION - C

4. *Microprocessor* : Architecture of 8086/8088 Processor Model; Instruction Set; Addressing Modes: Registers used in Microprocessor.

5. *Assembly Language* : Features of Assembly Language, Machine Language vs Assembly Language, Pseudo Instruction; use of Assembly for programs: Addition Subtraction, Multiplication using Subroutines and Basic Input/Output.

SECTION - D

6. *System Maintenance* : Introduction to various physical components of a computer, Physical Inspection and Diagnostics on PC, types of displays and other peripheral devices, installing software; Functional description of various Internal and External cards; Viruses: Types of Computer Viruses, Detection of Viruses, Protection from Viruses.

Paper-PA04 : Practical : Practical based on Paper-A04.