

**TEACHING & EXAMINATION SCHEME
For the Examination - 2015
COMPUTER SCIENCE**

B.Sc. Part-II

THEORY

			Pd/W (45mts.)	Exam. Hours	Max. Marks 150
CS 201	Paper I	Computer Organisation –I	2	3	50
CS 202	Paper II	Pascal and Data Structures	2	3	50
CS 203	Paper III	System Analysis and Design	2	3	50
PRACTICAL					
CS 204	Practicals		6	5	75
Total					225

B.SC. PART-II

PAPER I

COMPUTER ORGANIZATION - I

Note: The question paper for the examination will be divided in three parts i.e., Section – A, Section – B and Section – C.

Section – A: Will consist of 10 compulsory questions. There will be two questions from each unit and answer of each question shall be limited upto 30 words. Each question will carry 1 mark.

Section – B: Will consist of 10 questions. Two questions from each unit will be set and students will answer one question from each Unit. Answer of each question shall be limited upto 250 words. Each question carry 3.5 marks.

Section – C: Will consist of total 05 questions. The paper setter will set one question from each Unit and students will answer any 03 questions and answer of each question shall be limited upto 500 words. Each question will carry 7.5 marks.

UNIT 1:

Architecture of 8085 microprocessor and programming: Organization of 8085: Register organization, Bus organization, timing and controls. Data transfer: synchronous and

asynchronous data transfer, memory mapped I/O and peripheral mapped I/O, Interrupt data transfer and DMA transfer.

UNIT 2:

Peripheral devices and controllers: Architecture of simple I/O devices: Hex keyboard, LED display, VDU, Floppy disk, Hard disk and Optical disk data storage devices, block diagram representation of programmable keyboard/display interface, CRT controller, and floppy disk controller.

UNIT 3:

Interfacing devices: I/O ports, interfacing memory and I/O with microprocessor, general purpose interfacing Devices: programmable peripheral interface 8255 A, 8253 programmable interval timer, 8259 programmable interrupt and DMA controller.

UNIT 4:

Assembly language programming: Instruction set of 8085: Instruction codes, functional groups and addressing modes, fetch and execution of instructions, Assembly language programming, stack & subroutines, Assembler and assembler directives, pseudo instructions.

UNIT 5:

Applications of 8085: Designing of a microcomputer system: Hardware design, software design and program coding. Transfer of data between two microcomputers in distributed processing, Temperature monitoring system, Data acquisition system

PAPER II

PASCAL AND DATA STRUCTURES

Note: The question paper for the examination will be divided in three parts i.e., Section – A, Section – B and Section – C.

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Section – B: Will consist of 10 questions. Two questions from each unit will be set and students will answer one question from each Unit. Answer of each question shall be limited upto 250 words. Each question carry 3.5 marks.

Section – C: Will consist of total 05 questions. The paper setter will set one question from each Unit and students will answer any 03 questions and answer of each question shall be limited upto 500 words. Each question will carry 7.5 marks.

UNIT 1:

PASCAL: Constants, variables and labels, standard scalar data type, user defined, scalar data type, type declaration, structure of Pascal program, Expressions, input and output statements, relational and logic operators, transfer of control: unconditional transfer, conditional transfer, IF-then, IF-then-else, case statements, iterative statements, While, Repeat and For statements, nested loops.

UNIT 2:

Structured data types: Arrays, one dimensional and multi dimensional arrays, declaration of arrays, Records, declaration of records, accessing the fields of record, hierarchical records, array of records, WITH statement,

Functions and procedures: function subprogram, declaration and calling a function, procedures, declaration and calling a procedure, block structure, Local and Global identifiers, values and variables parameters, Recursion.

Pointers: pointer data type, defining pointer data type, variable declaration, operations on pointers, dynamic variables, dynamic data structure, Link Lists.

UNIT 3:

Stack: stack data structure, operation on stack, PUSH and POP operation, array and record implementation of stack, application of stack: evaluation of arithmetic expressions, recursion, Postfix, Prefix and Infix notations, converting infix expression to postfix, evaluating post fix expression.

Queues: Queue data structure, entering and deleting elements in queue, array implementation of queue, circular queue.

UNIT 4:

Link LISTS: linked representation, structure of list, linear linked list, insertion and deletion in a linear linked list, Header and Trailer nodes, Circularly linked list.

Tree: Tree data structures, general and binary tree, tree terminology, linear and linked representation, inserting and deleting elements in a binary tree, tree traversal, in order, pre order and post order traversal.

UNIT 5:

Graph : definition and representation, adjacency matrix, graph traversal, depth first search traversal, breadth first search traversal, Sorting: Introduction, Internal sorting and external sorting, Selection sort, Insertion sort, Bubble sort, Quick sort, Merge sort.

PAPER III SYSTEM ANALYSIS & DESIGN

Note: The question paper for the examination will be divided in three parts i.e., Section – A, Section – B and Section – C.

Section – A: Will consist of 10 compulsory questions. There will be two questions from each unit and answer of each question shall be limited upto 30 words. Each question will carry 1 mark.

Section – B: Will consist of 10 questions. Two questions from each unit will be set and students will answer one question from each Unit. Answer of each question shall be limited upto 250 words. Each question carry 3.5 marks.

Section – C: Will consist of total 05 questions. The paper setter will set one question from each Unit and students will answer any 03 questions and answer of each question shall be limited upto 500 words. Each question will carry 7.5 marks.

UNIT 1:

System concepts : Definition, characteristics, types of systems, management information system, definition and importance in business organization, system development life cycle, recognition of need, feasibility study, analysis, design, implementation and maintenance, planning and control for system success, prototyping.

UNIT 2:

System Planning and initial investigation : Information gathering about user staff, work flow, information gathering tools : review of literature, procedure and forms, on-site observation, interview and questionnaire, their types. Analysis tools: Data flow diagrams, data dictionary, decision trees and structures English, decision-tables, pros and cons of each tool, feasibility study and objectives, cost benefit analysis.

UNIT 3:

System Design and Implementation : Logical and physical design, structured design, IPO charts, processing controls and data validation, audit trails, documentation, input and output forms design, system testing and quality assurance, system security and disaster recovery.

UNIT 4:

Basic Network Functions : Overview, evolution of computer networks, elements of LAN and WAN, Network architecture, ISO-OSI architecture, Hard-ware elements- modems, multiplexers, concentrators, Transmission media, twisted pair, coaxial cable, optical fibre, LAN topologies: bus, ring and star.

UNIT 5:

Network interconnection issues : Internetworking bridges, routers, communication methods store and forward techniques, circuit switching, packet switching, introduction to TCP/IP protocol family issues related to network reliability and security.

Books suggested :

Award, E.M. : System Analysis and design, Galgotia Publications

Martin, J. Networks and Distributed Processing, Prentice Hall of India.

Marris-Mano : Computer System Architecture, Prentice Hall of India

Mathur, A.P. : Introduction to Microprocessors, Tata McGraw Hill

Gaonkar, R: Microprocessor Architecture, Programming and Application, New Age International

Ram, B. : Fundamentals of Micro-Processor and Micro-Computers, Dhanpat Rai & Sons, New Delhi

Raffiqzamman.M : Microprocessor : Theory and Application, Prentice Hall Of India

Gosh and Sridhar : Introduction to Microprocessor for Engineers and Scientists, Prentice Hall Of India Grover P.S. : PASCAL Programming and Fundamentals, Allied Publishers

Rajaraman : Computer Programming in PASCAL, Prentice Hall of India

Jensen, K. and Wirth, N. : PASCAL Users Manual and Report, Narosa Publishers House

Dale, N. and Lily, S.C. : PASCAL Plus Sdata Structure, Algorithms and Advance Programmking, Tata McGraw Hill
Tremblaman, J.P. and Sorensen, P.G. : An Introduction to Data Structures with Applications, McGraw Hill

EXPERIMENTS FOR PRACTICAL WORK

MICRO PROCESSOR LABORATORY

(i) Digital Laboratory

- (1) To study 4 bit adder and 4 bit subtractor.
- (2) To design and study 2 bit parity generator and checker.
- (3) To design and study 2 to 1 multiplexer and 1 to 2 de multiplexer.
- (4) To design logic circuit to find 2's complement of a 4 bit number.
- (5) To study a 4 bit magnitude comparator.

(ii) Assembly Language Programming

Note: All programmes be written in indirect addressing mode.

- (1) Write a program to find the sum of a series of 8 bit numbers.
- (2) Write a program to find the sum of a series of 16 bit numbers.
- (3) Write a program to find 2's compliment of 16-bit number.
- (4) Write a program to find least/most significant 4 bits of an 8-bit number.
- (5) Write a program to find the smallest of the series of 8 bit numbers.
- (6) Write a program to find the largest of the series of 8 bit numbers.
- (7) Write a program to arrange a series of 8 bit numbers into ascending order/
descending order.
- (8) Write a program to find the product of (i) 8-bit * 8-bit (ii) 16-bit * 8-bit.
- (9) Write a program to divide an 8-bit number by an 8-bit number up to 1 binary
Point.
- (10) Write a program to divide a 16bit number by an 8-bit/ 16: bits number.
- (11) Write a program to find square root of a perfect/imperfect 8-bit number.

SOFTWARE LABORATORY

(i) Elementary PASCAL Programming

- (1) Write a program to show the use of different standard scalar data types.
- (2) Write a program to show the use of sub range and enumerated data types
- (3) Write a program to show the use of arithmetic operations and build in functions in
expression evaluation
- (4) Write a program to show the use of if-then and if-then-else statements.
- (5) Write a program to show the use of if-then and case statement.
- (6) Write a program to show the use of arrays.
- (7) Write a program to show the use of while, repeat and for statements.
- (8) Write a program to show the use of procedure.
- (9) Write a program using recursion
- (10) Write a program to show the use of record data type.
- (11) Write a program to implement stack using array.
- (12) Write a program to show the operation of pointers.

- (13) Write a program to create a linked list using pointers.
- (14) Write a program to sort data using selection sort.
- (15) Write a program to sort data using insertion sort.
- (16) Write a program to sort data using bubble sort.