

HONS.- Second Year

PAPER-III

Full Marks-100

(Theory-75, Practical-25)

Group-1

COMPUTER FUNDAMENTALS

- ❖ Introduction to the N/W, Network Topologies, Types of channels : Twisted Wire, Co-axial wire, Microwave Communication, Satellite Communication, Optical fiber, Simplex, Duplex, Half Duplex Communication, Switching Techniques: Circuit Switching, Message Switching, Packet Switching, FEP, Repeaters, Bridge, Gateway, Token passing CS/CD, Protocols, ISO- OSI Model, NIC, Serial and Parallel Communications.

INTERNET

- ❖ Evolution, Protocols, Interface Concept, Internet Vs Intranet, Growth of internet, ISP, Connectivity- Dial-Up, Leased Line, VSAT, etc URLs, Domain Names, Portals, Application
- ❖ E-Mail Concept, POP and Web Based E-Mail, address, Basics of sending and receiving. E-mail protocols, Mailing list, Free Email services.

BOOLEAN ALGEBRA

- ❖ Boolean Algebra, Rules and Theorems, De'Morgan Theorem, Duality Principal, Logical gates, Canonical equations, K-Maps, Half Adder, encoder, decoder.

STRUCTURED PROGRAMMING

- ❖ Methods of documentation. Methods of analyzing a program requirement. Data flow diagrams.

C-LANGUAGE

Unit I

- ❖ Overview of C
- ❖ Introduction & features of C

- ❖ Structure of C Program
- ❖ Variables, Expressions, Identifiers, Keywords, Data Types, Constants
- ❖ Operators and Expressions
- ❖ Operator : Arithmetic, Logical, Relational, Conditional and Bitwise Operators Precedence and Associativity of Operators,
- ❖ Type Conversion in Expression

Unit II

- ❖ Basic Input/Output and Library Functions
- ❖ Single character input/output, i.e. getch (), getchar (), getche(), putchar()
- ❖ Formatted input/output i.e. printf() and scanf()
- ❖ Library functions concepts, Mathematical & Character functions.
- ❖ Control Structure
- ❖ If statements, If-Else statements, Nesting of If-Else Statements, else if ladder
- ❖ The?: Operator goto statement

Unit-III

- ❖ Single and Multi Dimensional arrays
- ❖ Array declaration and initialization of Arrays
- ❖ Strings : declaration, initialisation, functions.

Unit-IV

- ❖ Functions, The need and form of C functions, Userdefined and library functions, Function arguments, Return values and nesting of function, Recursion, Calling of functions, Array as function argument, Scope and life of variable- local and global variable, Storage class specifier- auto, extern, static, register

Unit-V

- ❖ Structure and union, Defining structure, Declaration of structure variable, Accessing structure member, nested Structure, Array of Structure, Structure Assignment, Structure as function argument, union

Unit-VI

- ❖ Basic of pointers, operators, Pointers and function, passing arrays to function, array pointers, pointers strings, pointers to structure, pointers within structure

Unit-VII

- ❖ Dynamic Memory Allocation, the process of memory allocation, malloc () operator, size of () operator, function calloc(), function free(), function realloc()

Unit-VIII

- ❖ File handling, file structure, file handling function, file type, streams, text. Binary, file pointer, opening file and closing file, writing and reading a character, using fopen(), getc(), putc().& fclose().using feof(), working with string fputs() & fgets(), flushing stream, using fread(), fwrite(), & rewrite(), direct access file.

Unit-IX

- ❖ Preprocessor Directive & Commands, the Preprocessor, #define, defining like macros, #error, #include, conditional compilation directive i.e, #if, #else, #elif and #ifdef & #undef # line

Text & References Books

- ❖ Pointor Thourgh C.Y. Kanitkar TSR through C.Y. Kanitkar Programing in C.E. Balaguru swami
- ❖ Programming in C language and project development.

PAPER-IV

Full Marks-100

(Theory-75, Practical-25)

Data Structure

Introduction to data structure

- ❖ Concept of data structure
- ❖ Abstract data Structure
- ❖ Analysis of Algorithm
- ❖ The concept of List
- ❖ Stack and Queues
- ❖ Introduction to stacks primitive operation on stack
- ❖ Stack as an abstract data type
- ❖ Multiple Stack
- ❖ Stack application : infix, postfix, prefix and recursion
- ❖ Introduction to queues
- ❖ Primitive operation on the queues
- ❖ Queues as an abstract data type
- ❖ Circular Queue
- ❖ Dequeue
- ❖ Priority queue
- ❖ Priority queue

Linked List

- ❖ Introduction to the linked list of Stack
- ❖ The Linked List of Queue
- ❖ Header nodes
- ❖ Doubly Linked List

- ❖ Circular Linked List
- ❖ Stack & Queue as a circular linked; List
- ❖ Applications of Linked List

Trees

- ❖ Basic Terminology
- ❖ Binary Tree
- ❖ The Tree representation as Array & Linked List
- ❖ Binary tree representation
- ❖ Traversal of Binary tree; In order, Preorder & Post order
- ❖ Application of Binary Tree
- ❖ Threaded Binary Tree
- ❖ B-Tree & Height Balanced tree, representation of B+ & B* trees
- ❖ Binary tree representation of trees
- ❖ Counting Binary trees

Searching and Sorting

- ❖ Sequential Searching. Binary Search, Insertion Sort, Selection Sort, Quick Sort, Bubble Sort, Radix Sort, Shell Sort, Heap Sort, Comparison of Sorting Methods

Tables and Graphs

- ❖ Hash Table, Collision resolution Technique, Introduction to Graphs, Definition, Terminology Directed, Undirected & Weighted, Graph, Representation of Graphs, Graph Traversal-Depth First & Breadth () First Search, Spanning Tree, Minimum Spanning Tree, The Basic Greedy Strategy for computing a Algorithm of Kruskal and Prims

Text & References Books

- ❖ Fundamentals of Data Structure: By S. Sawhney & Horowith
- ❖ Data Structure: R. B. Patel
- ❖ Data Structure: Tannenbaum

COMPUTER AIDED DRAFTING

- ❖ Introduction to AutoCAD / RoboCAD or similar package. Advanced features of these packages. Drawing plan of a building using AutoCAD etc. Anatsysis feature of AutoCAD

PRACTICAL

- ❖ Design of layout of a building. Design of interior of its rooms. Printing and plotting the prepared drawings.
- ❖ Fashion designing through AutoCAD.

SECOND YEAR

ENGLISH

- ❖ **An Anthology of English Prose** : National Prejudice-Goldsmith, Definition of Gentleman New man, Knowledge and Wisdom C. Russel, On being a Bore-R Lynd, does Cultural matter? Foster, The scientific point of View- Haldane, National Education-Gandhi, The Variety and Unity of India Nehru. Representative Short Stories: The case of Amontillado-Poe, The gift of the Magi-Henry, Mr. Know All-Maugham, The Dolls Mans field, A Raja Rao Animal Farm-George Orwell, Essay, Grammar (Common error : Idioms and phrases, Pair of world tens sequence).

ECONOMICS

- ❖ **Planning Types of Planning** : Capitalism, Socialism, & Mixed Economic Planning. Characteristics of Indian Economic- Poverty. Unemployment & Their measures. Population- forms & Development, population policy. Natural Resources Forest Policy, Energy Policy. Agriculture Cause to dawn fall & measures. Land improvement-limitation of ploughing, determination, joint farming, Chakbandi Co-operative farming. Agriculture-credit, Co-operative & Commercial Bank, Rural bank (NABARD) New scenario of agriculture development green revolution. Industrial Policy. 1956, 1977, 1980, Large Industry-Iron, Cement, Sugar & Jute. Small Scale Industry-Necessity & Problems. Foreign trade of India forms & Constructive. Indian five year plan special reference in seventh five year plan 9 book: Economic Planning & Indian Economic system : L.M. Ram, Indian Economy: Rudasadt & Sundaram.

MATHS

- ❖ **Differentials Calculus (3 Question)** : Successive Differentiation, Leibnitz's theorem, Taylor's series and maclaurin's series, Partial derivatives Euler's theorem, Indeterminate forms, Equation of Tangents and normals Asymptotes, Formulae of radius of Curvature in different co-ordinates system, Maxima and Minima of functions of single variable.
- ❖ **Integral Calculus (3 Question)** : Indefinite, Intergralm Definite Integral, Properties of Definite Integration, Integration by summation method. Reduction formula. Rectification and quadrature with simple examples, Volume and surface of solid of revolution, Moment of Inertia, Simple use of double and triple intergration and Gamma and Beta Function.

- ❖ **Differential equation (3 Question)** : Differential equation of 1st order and 1st degree. Separation of variables, Homogenous equations of first order and higher degree, Clairaut's form Linear differential equations of second with constant co-efficients, Orthogonal trajectories.
- ❖ **Vector analysis (3 Questions)** : Classification of Vectors Triple Products. Differentiation of a Vector functions, differentiation of a product of two vectors, Gradient of a scalar, Divergence and Curl of a vector in Cartesian co-ordinates.
- ❖ **Mechanics (2 Questions)** : Coplanar forces system, Necessary and sufficient condition for equilibrium of a particle, necessary condition for a system a particle to be in equilibrium. Reduction of a general plane force system, Equation of the line Basic concepts of mechanics. Basic laws of mechanics. Inertial frames of reference, work and energy, principles of linear momentum, angular momentum and energy for a particle, conservation field and potential energy, principle of conservation of energy for a particle. Rectilinear motion :- Uniformly accelerated motion (Including connected system) Resistem motion, Harmonic Oscillate damped and force vibrations, Elastic Springs and strings, Hook's law vertical and horizontal vibrations of a article attached to an elastic strings, Hook law's vertical and horizontal vibrations of a particle attached to an elastie string.
- ❖ **Motion in a plane (2 Questions)** : Components of velocity and acceleration, Cartesian radial and transverse, Tangential and normal.

Hindi (100 Marks)

पाठ्य-पुस्तकों से आलोचनात्मक प्रश्न (ग+प) - 80 अंक
पाठ्य पुस्तकें से व्याख्या निबन्ध - 20 अंक
निर्धारित पाठ्य पुस्तक : यशोधरा मैथिलीशरण गुप्त
अथवा कुरुक्षेत्र रामधारी सिंह दिनकर, कथा सरित स्व०
डॉ० लक्ष्मण प्रसाद सिन्हा, घर जमाई, पुरस्कार, पढ़ेगा,
अमीचन्द्र, करवा का व्रत 'चौथ' विष के दाँत, हंसा जाई
अकेला अथवा कुंज स्व० डॉ० हरिहर नाथ, मुफ्त का
यश, वह क्षण, परदा अच्छे आदमी, नागफाँस, अपरिचित
नौ पर्दे, स्व० डॉ० विनोद सिंह, नया पुराना, रीढ़ की
हड्डी, सड़क, परणागत, रात बीतने तक, शाहजहाँ के
आँसू अथवा एकांकी कुन्ज स्व० डॉ० उमेश चन्द्र मिश्र,
ताम्ये के कीड़े, दो कलाकार, शिवाजी का सच्चा स्वरूप,
माँ, सुखी डाली, शेरशाह।