

Unit 1: Computer organization and architecture

Boolean algebra, Number system, Basic concepts of floating point number system, Sequential and combinational circuits, Input/Output unit, Memory Organization, ALU and Control unit, Instruction and execution cycle in CPU, Introduction to microprocessors, Interrupts, CISC and RISC Architecture.

Unit 2: Programming language (C++/JAVA)

Computer algorithms, Flow Charts, Encapsulation, Inheritance, Polymorphism, Building blocks, Control structures, Arrays, Pointers, Dynamic memory allocation, File management.

Unit 3: Internet programming

Hyper Text Markup Language (HTML), Building static and dynamic web pages, Client side and server side scripting languages, Interaction with database.

Unit 4: Data structures

Representation of character, string and their manipulation, Linear list structure, Stack, Queue, Heaps, Linked list, Arrays, Tree, Graph, Sorting and Searching algorithms.

Unit 5: Software engineering

Requirement analysis and specification, Software Development Phases, Process models, Project structure, Project team structure, Role of metrics, Measurement, Software quality factors, Coding tools and techniques, Testing, Maintenance, Gantt charts, PERT and CPM, CASE tools.

Unit 6: Networking

Types of Networks, Network topology, Network Management, Data communication and transmission, ISO-OSI reference model, TCP/IP reference model, Internet standards and services, Cryptography, Data compression, Authentication and firewalls.

Unit 7: Compilers and translators

Regular expression, Finite automata, Formal languages, Finite state machines, Lexical analysis, Semantic analysis, Parsing algorithms, Symbol tables, Error handling, Intermediate code optimization, Machine code generation, Machine dependent optimization.

Unit 8: Operating system

Process management: Inter-process communication, Process scheduling; Memory management: Swapping, Virtual memory, Paging and segmentation; Device management: Deadlocks, Semaphores; File systems –Files, Directories, Security and protection mechanisms; Distributed operating systems.

Unit 9: Data base management system

Definition and features, Data models, Relational database: Logical and physical structure, Relational algebra, Relational calculus, Database design, Normalization, Concurrency control, Security and integrity, Query processing and optimization, Indexes, Backup and recovery; Distributed Databases – Concepts,

Architecture, Design; Structured Query Language (SQL), PL/SQL.

Unit 10: Numerical analysis

Interpolation, Numerical integration, Solution of ordinary differential equations, Solution of linear and non-linear system of equations; Statistical methods – Summarization of data, Frequency distribution, Measures of central tendency, Dispersion, Skewness and kurtosis, Theory of Probability, Random variable and mathematical expectation, Correlation and regression, Basic Principles of Design of Experiments: Analysis of Variance, Completely randomized design (CRD), Randomized complete block design (RCBD), Latin Square Design (LSD). Probability Distributions: Binomial, Poisson, Normal Distributions and their Applications. Concept of sampling, Sampling vs. Complete Enumeration, Sampling from a Finite Population, Simple Random Sampling. Test of significance based on normal, chi-square, t and F distributions, Curve fitting, Point estimation.

NOTE 4: The syllabus mentioned above is illustrative only. Questions relating to recent/current developments taking place in agriculture and allied sciences in general and in the concerned subject areas in particular can also be included in the question papers as may be deemed appropriate by subject- paper experts.