F.Y.B.Sc. (Computer Science)(CBCS 2018 Course) Semester –I

CS- 11 : Introduction to RDBMS

Course outcomes:

At the end of this course, a student shall be able to:

- solve real world problems using appropriate set, function, and relational models
- design E-R Model for given requirements and convert the same into database tables
- use database techniques such as SQL
- enhance the knowledge of database, file and types of file organizations

Total credits: 03 **Total lectures: 45**

Course content

1. File Organization (10)

1.1 Introduction
1.2 Physical / logical files
1.3 Types of file organization
1.4 Choosing a file organization

2. Introduction to RDBMS (05)

2.1Structure of Relational Databases (table, row, relation, Tuple)
2.2 keys in a relational database

3. Database Architecture (08)

3.1 Data models (relational, hierarchical, network)
3.2 Data abstraction
3.3 Data independence
3.4 Classification of DBMS

4. Conceptual Design (E-R model) (10)

4.1 Overview of DB design
4.2 ER data model (entities, attributes, entity sets, relations, relationship sets)
4.3 constraints (Key constraints, Mapping constraints, Strong & Weak entities, aggregation / generalization)
4.4 Conceptual design using ER modeling (entities VS attributes, Entity Vs relationship, binary Vs ternary, constraints beyond ER)
4.5 Case studies

5. Structure Query Language (12)

5.1 Introduction DDL (create, drop, alter), DML Statements (Insert, Update, Delete)
5.2 Forms of Basic SQL Query
5.3 union, intersection, nested queries
5.4 Aggregate Operator (group by, having), Aggregate functions

References

1. Database System Concepts, Henry F. Korth, Abraham Silberschatz, S.Sudarshan,
2. Database Management Systems ,Raghu Ramakrishnan, Mcgraw-hill higher Education
3. Database Management Systems,Raghu Ramakrishnan and Johannes
4. Gehrke ,McGraw-Hill Science/Engineering/Math; 3 edition,
5. Database Systems, Shamkant B. Navathe, Ramez Elmasri

*****

F.Y.B.Sc. (Computer Science) (CBCS 2018 Course) Semester –I

CS-12 : Programming in C - I

Course Outcomes:

At the end of this course, a student shall be able to:

- design the algorithms and draw flowcharts for solving mathematical and engineering problems.
- demonstrate an understanding of computer programming language concepts.
- develop C programs using data types, operators and various loops.
- design and develop Computer programs, analyze, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.

Total credits: 03 **Total lectures: 45**

Course content

1. Introduction (5)

Introduction to problem solving, Program development process, algorithms, Flowchart , Introduction to programming languages (High level, low level , machine)compiler, interpreter, assembler, linker, loader.

2. Introduction to C language (10)

Structured programming concept, benefits of structured programming, History of C language, Importance of C, Basic Structure of C program, scope, features, objectives and application areas, writing and executing a C program, benefits of structure programming.

3. C fundamentals (08)

Character set, C tokens, keywords, identifiers, variables, constants, operators(arithmetic, relational, logical ,special and other), expressions, data types, statements, Managing I/O operations.

4. Control structures (12)

Introduction, Basic control structures (sequence, selection/decision making Statement, Iterative statements, jump statements. etc.)

5. Functions (10)

Introduction, Standard functions, need for user defined functions , advantages of functions, how to write function, calling a function, Passing parameters, methods of passing arguments, recursion, storage Classes and its scope rules**.**

References

- Programming in C by S . Kohan
- Born to code in C by H. Schildt
- The art of C by H. Schildt
- C programming by Kerninghan & Richie by 2 nd edition
- Let us C by Yashwant Kanetkar
- C programming by E. Balaguruswami

*****

F.Y.B.Sc. (Computer Science) (CBCS 2018 Course) Semester -I

CS-13: Mathematical Foundation of Computer Science

Course Outcomes

At the end of this course, a student shall be able to:

- understand tautology, predicates and quantifiers.
- draw Hasse diagrams, example of lattices and it's types.
- apply counting principles, applications of Pigeonhole principle, permutation and combination to determine probability.
- solve recurrence relation for finding total solution with the help of homogenous solution and particular solution.

Total credits: 03 **Total lectures: 45**

Course content

Unit 1: Logic (12)

1.1 Revision: Propositional Logic, Propositional Equivalences.

1.2 Predicates and Quantifiers: Predicate, *n*-Place Predicate or, n-ary Predicate, Quantification and Quantifiers, Universal Quantifier, Existential Quantifier, Quantifiers with restricted domains, Logical Equivalences involving Quantifiers.

1.3 Rules of Inference: Argument in propositional Logic, Validity Argument (Direct and Indirect methods), Rules of Inference for Propositional Logic, Building Arguments.

Unit 2: Lattices and Boolean Algebra (12)

2.1 Poset, Hasse diagram.

2.2 Lattice, Complemented lattice, Bounded lattice and Distributive lattice.

2.3 Boolean Functions: Introduction, Boolean variable, Boolean Function of degree n, Boolean identities, Definition of Boolean Algebra.

2.4 Representation of Boolean Functions : Minterm, Maxterm Disjunctive normal form, Conjunctive normal Form.

Unit 3: Counting Principles (11)

3.1 Cardinality of a Set: finite set, countable and uncountable sets.

3.2 Basics of Counting: The Product Rule, The Sum Rule, The Inclusion-Exclusion Principle.

3.3 The Pigeonhole Principle: Statement, The Generalized Pigeonhole Principle, Its Applications.

3.4 Generalized Permutations and Combinations: Permutation and Combination with Repetitions, Permutations with Indistinguishable Objects, Distributing objects into boxes: Distinguishable objects and distinguishable boxes, Indistinguishable objects and distinguishable boxes, Distinguishable objects and Indistinguishable boxes, Indistinguishable objects and Indistinguishable boxes

Unit 4: Recurrence Relations (10)

4.1 Recurrence Relations : Introduction, Formation.

4.2 Linear Recurrence Relations with constant coefficients.

4.3 Homogeneous Solutions. **4.4** Particular Solutions. **4.5** Total Solutions.

Reference Books:

1. Kenneth Rosen, Discrete Mathematics and It's Applications (Tata McGraw Hill)
2. C. L. Liu ,Elements of Discrete Mathematics, (Tata McGraw Hill)
3. S.R. Patil, R.S.Bhamare, M.D.Bhagat, D.M.Pandhare, S.M Waingade, N.M Phatangare; Discrete Mathematics; Nirali Prakashan, 1998

*****

F.Y.B.Sc. (Computer Science)(CBCS 2018 Course) Semester-I

CS-14 : Algebra-I

Course Outcomes:

At the end of this course, a Student shall be able to:

- understand the concepts of sets, relations, functions, equivalence class and types of functions.
- find transitive closure with the help of Warshall's algorithm.
- understand integers, g.c.d., l.c.m. Concept of Division algorithm and obtain g.c.d by Division algorithm.
- understand coding, decoding, error detection and correction.
- understand the concepts of complex numbers, modulus and argument of complex numbers and solution of equations by using DeMoivre's theorem.

Total credits: 03 **Total lectures: 45**

Course content

Unit 1: Relations and functions (12)

(1.1) Ordered pairs, Cartesian product of Sets.

(1.2) Relations, types of relations, equivalence relations. Partial orderings.

(1.3) Equivalence Class, properties and partition of a set.

(1.4) Transitive closure and Warshall's Algorithm.

(1.5) Digraphs of relations, matrix representation and composition of relations.

(1.6) Definition of function as relation, types of functions (one-one, onto and bijective)

Unit 2: Divisibility in Integers (15)

(3.1) Well ordering principle

(3.2) First and second Principle of Mathematical Induction, Examples

(3.3) Division Algorithm (without proof)

(3.4) Divisibility and its properties, prime numbers.

(3.5) Definition G.C.D and L.C.M., Expressing G.C.D. of two integers as a linear combination of the two integers. **(3.6)** Euclidean Algorithm (Without proof).

(3.7) Relatively prime integers, Euclid are Lemma and its generalization.

(3.8) Congruence relations and its properties, Residue Classes: Definition, Examples: Z_n , +, X), Z_n is a field iff n is prime, addition and multiplication modulo n and composition tables

(3.9) Euler's and Fermat's Theorems. (Without proof).Examples

Unit 3: Coding Theory, Automata Theory and Languages, Group Codes (08)

(3.1) Coding of binary information and error detection

(3.2) Decoding and error correction **(3.3)** Linear codes, parity check

(3.4) Generator matrix ,examples of coset leader

Unit 4: Complex Numbers (10)

(4.1) Revision: Addition, Subtraction, Multiplication, Conjugate, Division

(4.2) Modulus and Argument of Complex number, Geometric Representation

(4.3) Polar form and it's properties **(4.4)** DeMoivre's theorem and it's applications

(4.5) Solution of equations by using DeMoivre's theorem

Text Books:

1. S.R. Patil, R.S.Bhamare, M.D.Bhagat, D.M.Pandhare, S.M Waingade, N.M Phatangare; Discrete Mathematics; Nirali Prakashan, 1998
2. M.D.Bhopatkar, C.S.Nimkar, S.Joglekar; Algebra; Vision Publications,1998.
3. S.R. Patil, R.S.Bhamare, M.D.Bhagat, D.M.Pandhare; Algebra; Nirali Prakashan, 1998.

*****

F.Y.B.Sc. (Computer Science) (CBCS 2018 Course) Semester I

CS-15 : Principles of Analog Electronics – I

Course Outcomes:

At the end of this course, a student shall be able to:

- study circuits in a systematic manner suitable for analysis and design.
- analyze the electric circuit using network theorems.
- reproduce the I-V characteristics of BJT and its biasing , JFET and MOSFET devices
- apply standard device models to explain/calculate critical internal parameters of semiconductor devices
- explain the behavior and characteristics of power devices such as SCR and UJT etc.

Total credits: 03 **Total lectures: 45**

Course content

1. Introduction to components (06)

Resistors, Capacitors, Inductors and Transformers, Charging and discharging of capacitors, Growth and decay of current in L-R circuits, Growth and decay of voltage in C-R circuits, Simple numerical on the above

2. Network theorems (only statement and problems applied to DC) (10)

Revision of Ohm's law & Kirchoff's laws, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Superposition theorem, (numerical problems with maximum two meshes)

3. Bipolar Junction Transistor (15)

Bipolar Junction Transistor (BJT) symbol, types, construction, working principle, I-V Characteristics, parameters, specifications; BJT as an amplifier .Transitor amplifier configuarations - CB, CC and CE; Transistor biasing, Q-point; DC load line for a CE amplifier; Transistor as a switch; Simple numerical problems on biasing and DC load line.

4. Amplifier (04)

Concept and definition of an amplifier, Classification based on frequency, coupling and operating point, Single stage RC coupled CE amplifier, Frequency response and bandwidth of RC coupled amplifier .

5. JFET and MOSFET (10)

Working Principle of JFET and MOSFET, I/V Characteristics, Parameters, Application of JFET as a switch and as an amplifier, Numerical problems, comparison of JFET, MOSFET and BJT, Working principle of UJT and SCR, Application of UJT as relaxation Oscillator.

Reference Books

1. Integrated circuits by Milliman.
2. Electronic Devices and circuits: A. Motorshed, Prentice Hall of India.
3. Basic Electronics:Bernard Grob, McGraw Hill Publication, 8th Revised Edition, 2010
4. Electronic Principles:Albert Malvino, David J Bates, McGraw Hill 7th Edition. 2012
5. Principals of Electronics: V.K. Mehta, S.Chand and Co.
6. A text book of electrical technology: B.L.Theraja, S.Chand and Co.

*****

F.Y.B.Sc. (Computer Science) (CBCS 2018 Course) Semester I

CS- 16: Principles of Digital Electronics –I

Course Outcomes:

At the end of this course, a Student shall be able to:

- understand and represent numbers in powers of base and converting one from the other, carry out arithmetic operations
- understand basic logic gates, concepts of Boolean algebra and techniques to reduce/simplify Boolean expressions
- understand and implement Boolean algebra and K-maps
- analyze and design combinatorial as well as sequential circuits

Total credits:03 **Total lectures: 45**

Course Content

1. Number Systems And conversions (06)

Binary, Octal , Decimal, Hexadecimal number systems; Inter conversions of number systems; BCD, Excess-3 code, Gray codes and Hamming codes; Error detection and correcting codes; Excess three code , One's and Two's compliment method; Examples

2. Logic gates And their Applications (15)

Revision of different logic gates; Boolean algebra and a few identities; De-Morgan's I^{st} and 2^{nd} theorem; Interconversion of gates; Rules of binary addition and subtraction, subtraction using 1's and 2's complements; Half adder, full adder, Half subtractor, Full subtractor, Four bit parallel adder; Universal adder / subtractor, Digital comparator; Introduction to logic families; TTL NAND gate, input output parameters, tristate logic; Fan-in fan-out, propagation delay, noise margin

3. Boolean Algebra and Karnaugh maps (12)

Boolean algebra rules and Boolean laws: Commutative, Associative, Distributive; AND, OR and Inversion laws; De Morgan's theorem, Universal gates; Min terms, Max terms, Boolean expression in SOP and POS form; conversion of SOP/POS expression to its standard SOP/POS form., Simplifications of Logic equations using Boolean algebra rules; Introduction to Karnaugh's map; Formation of Pair,Quad and Octet; Significance of Karnaugh Map; Simplification of 2,3 and 4 variables using K-Map

4. Multiplexers - Demultiplexers and Encoder –Decoder (12)

Introduction to multiplexers and Demultiplexers; 2:1,Mux 4:1Mux, 8:1 Mux; Multiplexer Tree; 1:2Demux,1:4Demux,1:8Demux; Introduction to Encoders and decoders; Decimal to BCD encoder; BCD to 7 Segment Decoder; Study of IC 74147 and IC74138.

Reference Books:

1. Digital Electronics: Jain R.P., Tata McGraw Hill
2. Digital Principles and Applications: Malvino Leach, Tata McGraw-Hill.
3. Digital Fundamentals: Floyd T.M., Jain R.P, Pearson Education

*****

F.Y.B.Sc.(Computer Science) (CBCS 2018 Course) Semester I

CS PI : Computer Science Practical -I

Total credits: 2

Course outcomes:

At the end of this course, a student shall be able to:

- enhance the fundamental concepts of RDBMS
- explore the knowledge about SQL environment
- work with operations of SQL

Course content

Practical Examination

A) Internal Marks 40 : Completion of journal , attendance and involvement in activities.

B) Semester examination: 60 Marks in One session of 3 Hrs .

60 marks Distribution: Practical work 50 marks and 10 marks for oral

List of Topics

1. Create simple tables.
2. Create tables using various data constraints.
3. Create tables using existing tables.
4. Different forms of select statements
5. Queries using insert, delete statements.
6. Queries using Alter and Update statements.
7. Simple queries using functions & Set Operators.
8. Simple queries using mathematical functions and Date functions

NOTE: At least 8 assignments must be performed.

Note: An Industrial visit should be arranged and report should be submitted at the end of academic year.

*****

F.Y.B.Sc. (Computer Science) (2018 Course) Semester I

CS PII : Computer Science Practical -II

Total credits: 2

Course Outcomes

After completion of this course, a student shall be able to:

- Understand the fundamental concepts of C language
- learn and implement control structures and functions
- design and implement simple C programs using loops and functions

Course content

Practical Examination

A) Internal Marks 40 : Completion of journal , attendance and involvement in activities.
B) Semester examination: 60 Marks in One session of 3 Hrs .
60 marks Distribution: Practical work 50 marks and 10 marks for oral

List of Topics

1. Introduction to c programming environment.
2. Basic programs using c programming language including use of arthmatic operators, areas etc.
3. Program base on if statements,if---else and nested if else statements
4. Programs based on condition checking and Looping (e.g. inverting Number, checking whether number is prime, finding GCD and LCM etc.)
5. .Program based on switch case ,return and goto statements.
6. Program using Function
7. Program using recursion

NOTE : At least 8 assignments must be performed.

****

F.Y.B.Sc. (Computer Science) (CBCS 2018 Course) Semester -I

CS EI : Electronics Practical –I

Total credits: 2

Course Outcomes

At the end of this course, a student shall be able to:

- use basic concepts for building various applications in Electronics.
- understand design procedures of different electronic circuits as per requirement.
- build experimental setup and test the circuits.
- analyze test results of given experiments.

Course content

- One activity equivalent to 2 experiments by the student.
  a. Electronics project
  b. Documentation type experiments
  c. Presentation/Seminar on Electronics /advanced topic/research topics.
- One activity equivalent to 2 experiments to be arranged by the teacher – Arrange at least two practical demonstrations / Workshops /Industrial visit which will enhance quality and skills of the student.
- Examination will be conducted on 8 experiments as well as on activities

Practical Examination

A) Internal Marks 40: Completion of journal, attendance and involvement in activities.

B) Semester examination: 60 Marks in One session of 3 Hrs. 60 marks Distribution: Practical work 50 marks and 10 marks for oral

Distribuition of 50 marks

Circuit diagram / flowchart and algorithm	15
Connection / program	10
Demonstration and working explanation	10
Observation table	10
Result analysis / conclusion	05

List of Topics

1. Identification of circuit components.
2. Use of CRO signal generators , power supplies and multimeters.
3. CRO for frequency ,phase and amplitude measurements.
4. Verification of KCL,KVL.
5. Verification of Thevenin's theorem.
6. Verification of Nortan's theorem.
7. Verification of maximum power transfer theorem.
8. Transistor as a switch.
9. FET characteristics.
10. SCR characteristics.
11. Study of logic gates.
12. Verification of De-Morgan's theorem and conversion of one gate to other
13. Study of potential divider biasing of BJT and its use in DC motor driving
14. Diode as half wave, full wave and bridge rectifier.
15. Study of output and transfer characteristics JFET/MOSFET
16. Study of I-V characteristics of UJT and Demonstration of UJT based relaxation oscillator.

NOTE : At least 8 Practical's must be performed.

*****

F.Y.B.Sc. (Computer Science) (CBCS 2018 Course) Semester- I

CS - 17 : Computer Oriented Statistical Techniques –I

Course Outcomes

At the end of this course, a student shall be able to:

- understand the importance and scope of statistics in various fields such as medical, management, economics, social science etc. & statistical organisation in India.
- know different types of data and its classification and graphs.
- know organisation and evaluation of different types of data and evaluation of summary
  measure such as measures of central tendency, dispersion, skewness and kurtosis.
- understand bi-variable data, their organisation, evaluation and scatter diagram and their interpretations.
- understand correlation, regression, regression lines and their utility.

Total credits: 3 **Total lectures: 45**

Course content

Unit 1. Scope of Statistics and Data Condensation and Graphical Methods (12)

1.1 Defination : Webseter's and Secrist's definition of Statistics
1.2 Importance of statistics
1.3 Scope of statistics : Industry, Goverment,. Computer science, social science,etc
1.4 Raw data, attributes and variables, discrete and continuous variables
1.5 General principles of classification of raw data
1.6 Construction of frequency distributionand cumulative frequency distribution, relative frequency distribution.
1.7 Graphical representation of frequency distribution : histogram,frequency polygon,frequency curve , ogive curve
1.8 Diagrammatic representation : simple bar, subdivided bar, pie diagram, use of MS-excel/ spreadsheet for domonstrating these diagram
1.9 Numerical problems

Unit 2.Measures of Central Tendency and Dispersion (12)

2.1 Concept of central tendency
2.2 Criteria for good measures of central tendency
2.3 Arithmetic mean : definition for ungrouped and grouped data, combined mean, merits and demerits
2.4 Median: defination, formula for computation for ungrouped and grouped data, graphical methods, merits and demerits
2.5 Mode: definition, formual for computation for ungrouped and grouped data, merits and demerits
2.6 Use of appropriat average
2.7 Quartiles: defination, formulae for grouped data
2.8 Concept of dispersion and measures of dispersion
2.9 Absolute and relative measure of dispersion
2.10 Range: definition for ungrouped data, merits and demerits
2.11 Variance: definition for ungrouped and grouped data, combined Variance for two groups, merits and demerits
2.12 Standard deviation: definition for ungrouped and grouped data, Coefficient of variation
2.13 Numerical problems

Unit 3. Moments and Measures of Skewness and Kurtosis (11)

3.1 Raw and central moments: definition, for ungrouped and grouped Data (only up to first 4 moments)

3.2 Relation between central and raw moments

3.3 Idea of symmetric frequency distribution, skewness of a frequency distribution, positive and negative skewness, empirical relation between mean, median and mode

3.4 Pearson's and Bowley's coefficients of skewness

3.5 Idea of kurtosis for a frequency distribution

3.6 Measures of skewness and kurtosis based on moments

3.7 Numerical problems

Unit 3. Correlation and Regression (for ungrouped data) (10)

4.1 Bivariate data : scatter diagram

4.2 Concept of correlation, positive correlation, negative correlation

4.3 Karl Pearson's cofficient of correlation (r)

4.4 Limits of r, $-1 \leq r \leq 1$, and interpretation of r

4.5 Concept of regression, cause and effect relation

4.6 Properties of regression coefficient : $b_{xy}\ b_{yx} = r^2$, $b_{xy}\ b_{yx} \leq 1$, $bxy = r\sigma_x/\sigma_y$, and $bxy = r\ \sigma_y/\sigma_x$

4.7 Numerical problems

Books Recommended

1. Hogg R. V. and Craig, R. G. Introduction to Mathematical Statistics.
2. Hoel. P. G. Introduction to Mathematical Statistics.
3. Feller. W Introduction to probability Theory and it's Applications. Vol –I
4. Mood A. M., Grabill, F. A. Boes D. C. Introduction to Theory of Statistics.
5. Meyar P. L. Introduction to Probability and Statistical Applications.
6. Goon, Gupta and Das Gupta Fundamentals of Statistics Vol I & II
7. S. P. Gupta Statisticalmethods.

*****

F. Y. B. Sc.(Computer Science) (CBCS 2018 Course) Semester – I

CS 18: Compulsory English – I

Course Outcomes:

At the end of this course, a student shall be able to:

- get exposed to the prose passages, poems and communicative grammar skills
- read and interpret the various types of texts on their own and discuss them among peers
- communicate effectively by developing their proficiency in language
- understand their language abilities and facilitate them to with the necessary online & offline resources

Total Credits: 03 **Total Lectures: 45**

Course Content:

Prescribed Text: ***Views & Visions: An English Course book for Undergraduates*** *by* Orient BS

Prose:

1. Towards Universal Brotherhood — *Rashtrasant Tukdoji Maharaj*
2. Buddha, 'The Enlightened One' — *Max Eastman*
3. How Wealth Accumulates and Men Decay — *George Bernard Shaw*
4. The Romance of a Busy Broker — *O. Henry*
5. Kalpana Chawla — Anonymous

Poetry:

1. Where the Mind is Without Fear — *Rabindranath Tagor*
2. A Psalm of Life — *H.W. Longfellow*
3. Mirror — *Sylvia Plath*
4. Lord Ullin's Daughter — *Thomas Cambell*
5. Curious Mishaps — *Vikram Seth*

Grammar, Usage and Composition:

1. Articles
2. Prepositions
3. Tense
2. Kinds of Sentences
5. Transformation of Sentences

(Note: All the units as covered in the prescribed text.)

***** ***** *****

F.Y.B.Sc. (Computer Science) (CBCS 2018 Course) Semester –I

CS- 19 : Elementary Algorithmics

Course Outcomes:

At the end of this course, a student shall be able to:

- apply good principles of algorithm design.
- analyze the searching and sorting patterns
- apply their theoretical knowledge in practically.

Total credits: 03 **Total lectures: 45**

Course content

1. Concepts of Problem, Procedure and Algorithm, Algorithm Representation through Pseudo-Code and Flow-Charts Tracing of Algorithms. Concept of a program and structure of procedure oriented languages. **(07)**

2. Problem Analysis and Design of Algorithms for problems such as (i) Swapping (ii) Counting (3) Finding the Sum, Product, maximum, minimum of a list of numbers, and (iii) Simple variations of the above problems realization that there may be alternative algorithm and that one algorithm may be better (in some sense) than the other. **(06)**

3. Problem Analysis and Design of Algorithms for problems such as (i) Evaluation of a polynomial (ii) Sum of first n factorials (iii) Finding the n^{th} term of Fibonacci sequence, (iv) Finding the largest and second largest of a list,(v) Evaluating finite series and variations of these problems, (vi) Determining n^{th} root of a number **(08)**

4. Introduction to recursive algorithms and their tracing. Applications to (i)Computation of a factorial, sum, maximum, Fibonacci terms (ii) Base conversion (iii) Reversing a String and checking for palindrome property.(4) To compute GCD . **(08)**

5. Concept of array and problems that involve array manipulation (i) Removing the duplicates (ii) Partitioning of an array, (iii) Listing of prime numbers (iv) Finding the prime factor of a number (v) Printing a Histogram. **(08)**

6. The problem of search and merge, Linear, Binary search algorithms. The problem of Sorting, Selection, Insertion, Bubble, Quick, and Merge Sort algorithms. **(08)**

Reference Books:

1. How to solve it by a computer by Dromey R.G.
2. Data Structures, Algorithms and applications in C++ (Ch I I) by Sartaj Sahni

*****