**Integral University Lucknow**

**Study & Evaluation Scheme**

**B. Tech. (CSE) Cloud Technology and Information Security**

**YEAR II, Semester- III**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl. No** | **Subject Code** | **Category** | **Subject** | **Periods** | | | | **Evaluation Scheme** | | | | **Subject Total** |
| **Sessional** | | | **Exam** |  |
| **L** | **T** | **P** | **C** | **CT** | **TA** | **CA** | **ESE** |
| 1 | CS-230 | HM | Introduction to Communication Skills | 2 | 1 | 0 | 3 | 25 | 15 | 40 | 60 | 100 |
| 2 | CS-231 | DC | Computer Architecture and Organization | 2 | 1 | 0 | 3 | 25 | 15 | 40 | 60 | 100 |
| 3 | CS-232 | DC | Data Structures & Algorithms | 2 | 1 | 0 | 3 | 25 | 15 | 40 | 60 | 100 |
| 4 | CS-234 | DC | Object Oriented Programming using JAVA | 2 | 1 | 0 | 3 | 25 | 15 | 40 | 60 | 100 |
| 5 | CS-236 | DC | Information Security Fundamentals | 3 | 1 | 0 | 4 | 25 | 15 | 40 | 60 | 100 |
| 6 | CS-238 | DC | Cryptography Fundamentals | 3 | 1 | 0 | 4 | 25 | 15 | 40 | 60 | 100 |
| 7 | CS-239 | DC | Operating System Building Blocks | 2 | 1 | 0 | 3 | 25 | 15 | 40 | 60 | 100 |
| 8 | BM-226 | HM | \* Human Values and Professional Ethics | 3 | 0 | 0 | - | - | - | - | 50 | 50 |
| 9 | CS-233 | DC | Data Structures& Algorithms Lab | 0 | 0 | 2 | 1 | 30 | 30 | 60 | 40 | 100 |
| 10 | CS-235 | DC | Object Oriented Programming using JAVA Lab | 0 | 0 | 2 | 1 | 30 | 30 | 60 | 40 | 100 |
| 11 | CS-237 | DC | Information Security Lab | 0 | 0 | 2 | 1 | 30 | 30 | 60 | 40 | 100 |
|  |  |  | **TOTAL** | **19** | **7** | **6** | **26** | **265** | **195** | **460** | **540** | **1000** |

\*Audit Course (BM226): This is compulsory audit course. A student must clear this paper with 50% passing marks up to the final year and marks will not be included in result.

**L-**Lecture **T-T**utorial **P-**Practical **C**-Credits **CT-**Class Test **TA-**Teacher Assessment

**Sessional Total (CA)** = Class Test + Teacher Assessment

**Subject Total** = Sessional Total (CA) + End Semester Examination (ESE)

**DC-** Departmental Core **HM-** Humanities

**DE-** Departmental Elective

**ESA-** Engineering Sciences & Arts (Foundation Course & Engineering Courses)

**Integral University, Lucknow**

**Department of Computer Science & Engineering**

**B.Tech. (CSE) CTIS, 2nd Year/3rd Semester**

**Subject Name: Introduction to Communication Skills, Subject Code: CS-230**

**w.e.f. July-2017**

**L T P C**

**2 1 0 3**

**Unit I**

**Oral Communication**

Principles of nonverbal communication - through clothes and body language, Types of managerial speeches - speech of introduction, speech of thanks, occasional speech, theme speech, Mastering the art of giving interviews in selection or placement interviews, discipline interviews, appraisal interviews, exit interviews, Building Persuasion & Negotiation abilities. [8]

**Unit II**

**Communication in Business**

Role of Communication in Business - Main forms of Communication in Business - Communication process - Coding and decoding - Roots of misunderstanding - Inferential model - Original message and reconstructed message - Symbols mismatch implications -Non-verbal symbols - Verbal symbols - Seven communication roadblocks - Communicating across cultures. [8]

**Unit III**

**Better Public Speaking & Presentation**

Introduction; Definition; Speaking to Audience; Preparing a Presentation; Achieving Clarity and Impact; Using Visuals; Arranging the room; Presentation Planning Checklist; Presentation Delivery, appearance, Visual Aids; Understanding Presentations Aspects; Making Technical Talk interesting, Preparation, Research, Organizing Materials; Delivering presentation. [8]

**Unit IV**

**Written Communication**

7cs of written communication, Business letters - Stationery - Format and layout -E-mail - Managing the mailbox - Presenting mail – Common sense and etiquette. Report Writing - Parts of a report - Qualities of a good report - Improving writing skills, internal communication through memos, minutes, notices & reports. [8]

**Unit V**

**Sample Business Letters**

Types of Business letters - routine letters, bad news and persuading letters, sales letters, Inquiries, Circulars, Quotations, Orders, Acknowledgments, Executions, Complaints, Claims & Adjustments, collection letters, job application letters, Curriculum Vitae / Resume -Invitation to interview - Offer of employment - Letter of acceptance -Letter of resignation -Recommendation letter, Logical Traps. [8]

**Reference Books:**

1. Matthukutty M Monippally, Business Communication Strategies, Tata McGraw-Hill.
2. Chaturvedi P.D. et al, Business Communication; Concepts, Cases, & Applications, Pearson Education.
3. Shirley Taylor, Communication for Business, Pearson Education.
4. Lesiicar and Flatley, BasicBusiness Communication, Tata McGraw-Hill.
5. Courtan L. Bovees et al., Business Communication Today, Pearson Education.

**Integral University, Lucknow**

**Department of Computer Science & Engineering**

**B.Tech. (CSE) CTIS, 2nd Year/3rd Semester**

**Subject Name: Computer Architecture and Organization, Subject Code: CS-231**

**w.e.f. July-2017**

**L T P C**

**2 1 0 3**

**Unit I**

**Register Transfer and Micro-operation**

Register Transfer Language, Register Transfer, Bus and Memory Transfer: Three state bus buffers, Memory Transfer. Arithmetic Micro-operations: Binary Adder, Binary Adder-Subtrator, Binary Incrementor, Logic Micro-operations: List of Logic micro operations, Shift Micro-operations (excluding H/W implementation), Arithmetic Logic Shift Unit.

[8]

**Unit II**

**Basic Computer Organization**

Instruction Codes, Computer Registers: Common bus system, Computer Instructions: Instruction formats, Instruction Cycle: Fetch and Decode, Flowchart for Instruction cycle, Register reference instructions. [8]

**Unit III**

**Micro Programmed Control Unit**

Control Memory, Address Sequencing, Conditional branching, Mapping of instruction, Subroutines, Design of Control Unit, Central Processing Unit: Introduction, General Register Organization, Stack Organization: Register stack, Memory stack; Instruction Formats, Addressing Modes. [8]

**Unit IV**

**Computer Arithmetic**

Introduction, Addition and Subtraction, Multiplication Algorithms (Booth algorithm), Division Algorithms, Input – Output Organization: Peripheral devices, Input – Output interface, Introduction of Multiprocessors: Characteristics of multi-processors. [8]

**Unit V**

**Modes of Data Transfer and Memory Organization**

Modes of Data Transfer: Priority Interrupt, Direct Memory Access, Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory. [8]

**Reference Books:**

1. Computer System Architecture by Morris Mano, PHI
2. Computer Organization and Architecture by William Stallings, PHI
3. Digital Computer Electronics: An Introduction to Microcomputers by Malvino, TMH
4. PC Hardware in a Nutshell by Barbara Fritchman Thompson, Robert Bruce Thompson, O’Reilly, 2nd Edition , 2010
5. Fundamentals of Computer Organization and Architecture by Mostafa AB-EL-BARR and Hesham EL-REWNI, John Wiley and Sons
6. Fundamental Of computer Organization by Albert Zomaya, 2010

**Integral University, Lucknow**

**Department of Computer Science & Engineering**

**B.Tech. (CSE) CTIS, 2nd Year/3rd Semester**

**Subject Name: Data Structures & Algorithms, Subject Code: CS-232**

**w.e.f. July-2017**

**L T P C**

**2 1 0 3**

**Unit I**

**Introduction to Data structures**

Definition, Classification of data structures: primitive and non-primitive, Elementary data organization, Time and space complexity of an algorithm (Examples), String processing. Dynamic memory allocation and pointers: Definition of dynamic memory allocation, Accessing the address of a variable, Declaring and initializing pointers, Accessing a variable through its pointer, Meaning of static and dynamic memory allocation, Memory allocation functions: Malloc(), Calloc(), free() and realloc(). Recursion: Definition, Recursion in C (advantages), Writing Recursive programs – Binomial coefficient, Fibonacci, GCD. [8]

**Unit II**

**Searching and Sorting**

Basic Search Techniques: Sequential search: Iterative and Recursive methods, Binary search: Iterative and Recursive methods, Comparison between sequential and binary search. Sort: General background and definition, Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort. [8]

**Unit III**

**Stack and Queue**

Stack – Definition, Array representation of stack, Operations on stack: Infix, prefix and postfix notations, Conversion of an arithmetic expression from Infix to postfix, Applications of stacks. Queue: Definition, Array representation of queue, Types of queue: Simple queue, Circular queue, Double ended queue (deque) , Priority queue , Operations on all types of Queues. [7]

**Unit IV**

**Linked List**

Definition, Components of linked list, Representation of linked list, Advantages and Disadvantages of linked list. Types of linked list: Singly linked list, doubly linked list, Circular linked list, Operations on singly linked list: creation, insertion, deletion, search and display. [9]

**Unit V**

**Tree Graphs and their Applications:**

Definition : Tree, Binary tree, Complete binary tree, Binary search tree, Heap Tree terminology: Root, Node, Degree of a node and tree, Terminal nodes, Non-terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node. Binary tree: Array representation of tree, Creation of binary tree. Traversal of Binary Tree: Preorder, Inorder and postorder. Graphs, Application of Graphs, Depth First search, Breadth First search. [8]

**Reference Books:**

1. Weiss, Data Structures and Algorithm Analysis in C, II Edition, Pearson Education, 2001
2. Lipschutz: Schaum’s outline series Data structures Tata McGraw-Hill
3. Robert Kruse Data Structures and program designing using ‘C’
4. Trembley and Sorenson Data Structures
5. E. Balaguruswamy Programming in ANSI C.
6. Bandyopadhyay, Data Structures Using C Pearson Education, 1999
7. Tenenbaum, Data Structures Using C. Pearson Education, 200
8. Kamthane: Introduction to Data Structures in C. Pearson Education 2005.
9. Hanumanthappa M., Practical approach to Data Structures, Laxmi Publications, Fire Wall media 2006
10. Langsam, AusensteinMaoshe& M.Tanenbaum Aaron Data Structures using C and C++ Pearson Education

**Integral University, Lucknow**

**Department of Computer Science & Engineering**

**B.Tech. (CSE) CTIS, 2nd Year/3rd Semester**

**Subject Name: Object Oriented Programming Using Java, Subject Code: CS-234**

**w.e.f. July-2017**

**L T P C**

**2 1 0 3**

**Unit I**

**Introduction**

History and Overview of Java, Object Oriented Programming, Control statements- if and for loop. Using Blocks of codes, Lexical issues - White space, identifiers, Literals, comments, separators, Java Key words, Data types - Integers, Floating point, characters, Boolean, A closer look at Literals, Variables, Type conversion and casting. Automatic type promotion in Expressions Arrays. Operators - Arithmetic operators, Bit wise operators, Relational Operators, Boolean Logical operators, Assignment Operator, Operator Precedence. Control Statements – Selection Statements - if, Switch, Iteration Statements - While, Do-while, for Nested loops, Jump statements. [8]

**Unit II**

**Classes**

Class Fundamentals, Declaring objects, Assigning object reference variables. Methods - constructors, “this” keyword, finalize ( ) method A stack class, Over loading methods. Using objects as parameters, Argument passing, Returning objects. Recursion, Access control, Introducing final, understanding static. Introducing Nested and Inner classes. Using command line arguments. Inheritance – Basics, Using super, method overriding, and Dynamic method Dispatch, Using abstract classes and final with Inheritance. [8]

**Unit III**

**Packages**

Definition. Access protection importing packages. Interfaces: Definition and implementation. Exception Handling – Fundamentals, types, Using try and catch and Multiple catch clauses, Nested try Statements, throw, throws, finally. Java’s built-in exception, using Exceptions. [8]

**Unit IV**

**Multithreaded Programming:**

Java thread model – main thread, creating single and multiple thread. Is alive ( ) and join ( ). Thread – Priorities, Synchronization, Inter thread communication, suspending, resuming and stopping threads, using multi-threading. I / O basics – Reading control input, writing control output, Reading and Writing files. Applet Fundamentals – AWT package, AWT Event handling concepts, the transient and volatile modifiers. Using instance of using assert.

[8]

**Unit V**

**JAVA Database Connectivity (JDBC):**

Database connectivity – JDBC architecture and Drivers. JDBC API - loading a driver, connecting to a database, creating and executing JDBC statements, handling SQL exceptions. Accessing result sets :types and methods. An example - JDBC application to query a database. [8]

**Reference Books:**

1. The complete reference Java –2: V Edition by Herbert Schildt Pub. TMH.
2. SAMS teach yourself Java – 2: 3rd Edition by Rogers Cedenhead and Leura Lemay Pub. Pearson Education.

**Integral University, Lucknow**

**Department of Computer Science & Engineering**

**B.Tech. (CSE) CTIS, 2nd Year/3rd Semester**

**Subject Name: Information Security Fundamentals, Subject Code: CS-236**

**w.e.f. July-2017**

**L T P C**

**3 1 0 4**

**Unit I**

**Introduction to Information Security**

Introduction: Security Definition, Why Security, Security and its need, Current Trends and Statistics, Basic Terminology, The C I A of Security the Relation: Security functionality and Ease of Use Triangle. [8]

**Unit II**

**User Identity and Access Management**

User identity and Access Management: Authentication, Account Authorization, Validation, Access Control and Privilege management. Hashing and Cryptography- Encryption and Decryption. [8]

**Unit III**

**System and Server Security**

System Security, Desktop & Server Security, Firewalls, Password cracking Techniques, Key-logger, viruses and worms, Malwares & Spy wares, Windows Registry. [8]

**Unit IV**

**Internet Security**

Internet Security: LAN Security, Email Security, Hacking attacks, preventive measures. [8]

**Unit V**

**Risk Assessment and Cyber Laws**

Vulnerability Assessment, Penetration Testing**,** Cyber Laws. [8]

**Text Book:**

1. Information Systems Security: Security Management, Metrics, Frameworks And Best Practices - Nina God bole, ISC2 Press, 2010

**Reference Book:**

1. Information Security Management Handbook, Volume 4 - Micki Krause, ISC2 Press, 2007

**Integral University, Lucknow**

**Department of Computer Science & Engineering**

**B.Tech. (CSE) CTIS, 2nd Year/3rd Semester**

**Subject Name: Cryptography Fundamentals, Subject Code: CS-238**

**w.e.f. July-2017**

**L T P C**

**3 1 0 4**

**Unit I**

**Introduction to Cryptography**

The Confidentiality, Integrity & Availability (CIA) Triad, Cryptographic concepts, methodologies &practices, Symmetric& Asymmetric cryptography, public& private keys, Cryptographic algorithms and uses, Construction& use of Digital signatures. [10]

**Unit II**

**Types of Algorithms**

The basic functionality of hash/crypto algorithms (DES, RSA, SHA, MD5, HMAC, DSA) and effects on key length concepts in Elliptical Curve Cryptography & Quantum Cryptography. [12]

**Unit III**

**Key Management**

The basic functions involved in key management including creation, distribution, verification, revocation and destruction, storage, recovery and life span and how these functions affect cryptographic integrity. [8]

**Unit IV**

**Application of Cryptography**

Major Key distribution methods and algorithms including Kerberos, ISAKMP etc., Vulnerabilities to cryptographic functions, the Use and functions of Certifying Authorities (CAs), Public Key Infrastructure (PKI) and System architecture requirements for implementing cryptographic functions. [10]

**Reference Books:**

1. Information Systems Security: Security Management, Metrics, Frameworks and Best Practices by Nina Godbole
2. Cryptography and Security by C K Shyamala, N Harini and Dr T R Padmanabhan – Wiley Publications, First Edition

**Integral University, Lucknow**

**Department of Computer Science & Engineering**

**B.Tech. (CSE) CTIS, 2nd Year/3rd Semester**

**Subject Name: Operating System Building Blocks, Subject Code: CS-239**

**w.e.f. July-2017**

**L T P C**

**2 1 0 3**

**Unit 1: Introduction to Operating System**

Introduction, Objectives and Functions of OS, Evolution of OS, OS Structures, OS Components, OS Services, System calls, System programs, Virtual Machines. [6]

**Unit 2: Process Management**

**Processes:** Process concept, Process scheduling, Co-operating processes, Operations on processes, Inter process communication, Communication in client-server systems. Threads: Introduction to Threads, Single and Multi-threaded processes and its benefits, User and Kernel threads, Multithreading models, Threading issues.

**CPU Scheduling:** Basic concepts, Scheduling criteria, Scheduling Algorithms, Multiple Processor Scheduling, Real-time Scheduling, Algorithm Evaluation, Process Scheduling Models.

Process Synchronization: Mutual Exclusion, Critical – section problem, Synchronization hardware, Semaphores, Classic problems of synchronization, Critical Regions, Monitors, OS Synchronization, Atomic Transactions

**Deadlocks:** System Model, Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock. [14]

**Unit 3: Storage Management**

**Memory Management**: Logical and physical Address Space, Swapping, Contiguous Memory Allocation, Paging, Segmentation with Paging.

**Virtual Management:** Demand paging, Process creation, Page Replacement Algorithms, Allocation of Frames, Thrashing, Operating System Examples, Page size and other considerations, Demand segmentation

**File-System Interface:** File concept, Access Methods, Directory structure, File- system Mounting, File sharing, Protection and consistency semantics

**File-System Implementation:** File-System structure, File-System Implementations, Directory Implementation, Allocation Methods, Free-space Management, Efficiency and Performance, Recovery

**Disk Management:** Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Attachment, stable-storage Implementation. [10]

**Unit 4: Protection and Security**

**Protection:** Goals of Protection, Domain of Protection, Access Matrix, Implementation of Acess Matrix, Revocation of Access Rights, Capability- Based Systems, Language – Based Protection

**Security:** Security Problem, User Authentication, One – Time Password, Program Threats, System Threats, Cryptography, Computer – Security Classifications. [5]

**Reference Books**:

* + 1. Milan Milonkovic, Operating System Concepts and design, II Edition, McGraw Hill 1992.
    2. Tanenbaum, Operation System Concepts, 2nd Edition, Pearson Education.
    3. Silberschatz / Galvin / Gagne, Operating System,6th Edition,WSE (WILEY Publication)
    4. William Stallings, Operating System, 4th Edition, Pearson Education.
    5. H.M.Deitel, Operating systems, 2nd Edition ,Pearson Education

1. Abraham Silberschatz and peter Baer Galvin, Operating System Concepts, 8th Edition, Pearson Education 1989 (Chapter 1,3.1,3.2,3.3,3.4,3.6,4,5,6 (Except 6.8,6.9), 7, 8,9,10,11,13, (Except 13.6) 19 (Except 19.6),20(Except 20.8, 20.9), 22,23)
2. Nutt: Operating Systems, 3/e Pearson Education 2004

**Integral University, Lucknow**

**Department of Computer Science & Engineering**

**B.Tech. (CSE) CTIS, 2nd Year/3rd Semester**

# Subject Name: Human Values & Professional Ethics, Subject Code: BM-226

**w.e.f. July-2017**

**L T P C**

**3 0 0 0**

**Unit-1**

**Human Value Education:** Understanding the need, basic guidelines, content and process for Value Education, Self Exploration - Its content and process; ‘Natural Acceptance’ and Experiential Validation- as the mechanism for self exploration, Continuous Happiness and Prosperity- A look at basic Human Aspirations, Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority, Understanding Happiness and Prosperity correctly. [6]

**Unit-2**

**Introduction to Ethical Concept:** Definition of industrial ethics and values, Ethical rules of industrial worker. Values and Value Judgments. Moral Rights and Moral rules, Moral character and responsibilities. Privacy, Confidentiality, Intellectual Property and the Law. Ethics as Law. [6]

**Unit-3**

**Professional Responsibility:** The basis and scope of Professional Responsibility, Professions and Norms of Professional Conduct, Ethical Standards versus Profession, Culpable mistakes, the Autonomy of professions and codes of ethics. Employee status and Professionalism. Central Professional Responsibilities of Engineers: The emerging consensus on the Responsibility for safety among engineers, hazards and risks. [6]

**Unit-4**

**Engineers Ethics:** Senses of 'Engineering Ethics' - variety of moral issues - types of inquiry - moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories. Valuing Time – Co-operation – Commitment. [6]

**Unit-5**

**Global Issues:** A Glimpse of Life Stories: **Life story of Prophet Mohammad**, Mahatma Gandhi, Swami Vivekanand, Marie Curie and Steve Jobs.

Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral leadership. [6]

**Reference Readings:**

**Text Book**

1. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Value Education.
2. Mike Martin and Roland Schinzinger, “Ethics in Engineering”, McGraw-Hill, New York 1996.
3. Govindarajan M, Natarajan S, Senthil Kumar V. S, “Engineering Ethics”, Prentice Hall of India, New Delhi, 2004.

**Relevant CDs, Movies, Documentaries & Other Literature:**

1. Value Education website, *http://www.uptu.ac.in*
2. Story of Stuff, [*http://www.storyofstuff.com*](http://www.storyofstuff.com)
3. Al Gore, *An Inconvenient Truth*, Paramount Classics, USA
4. Charlie Chaplin, *Modern Times*, United Artists, USA
5. IIT Delhi, *Modern Technology – the Untold Story*
6. The Hundred, Michael Hart

**Integral University, Lucknow**

**Department of Computer Science & Engineering**

**B.Tech. (CSE) CTIS, 2nd Year/3rd Semester**

**Subject Name: Data Structures and Algorithms Lab, Subject Code: CS-233**

**w.e.f. July-2017**

**L T P C**

**0 0 2 1**

**List of Programs:**

**Part A**

1. Use a recursive function to find GCD of two numbers.
2. Use a recursive function to find the Fibonacci series.
3. Use pointers to find the length of a string and to concatenate two strings.
4. Use pointers to copy a string and to extract a substring from a given a string.
5. Use a recursive function for the towers of Hanoi with three discs.
6. Insert an integer into a given position in an array.
7. Deleting an integer from an array.
8. Write a program to create a linked list and to display it.
9. Write a program to sort N numbers using insertion sort.
10. Write a program to sort N numbers using selection sort.

**Part B**

1. Inserting a node into a singly linked list.
2. Deleting a node from a singly linked list.
3. Pointer implementation of stacks.
4. Pointer implementation of queues.
5. Creating a binary search tree and traversing it using in order, preorder and post order.

6. Sort N numbers using merge sort

**Integral University, Lucknow**

**Department of Computer Science & Engineering**

**B.Tech. (CSE) CTIS, 2nd Year/3rd Semester**

**Subject Name: Object Oriented Programming Using Java Lab, Subject Code: CS-235**

**w.e.f. July-2017**

**L T P C**

**0 0 2 1**

**Part A**

1. Write a program to check whether two strings are equal or not.
2. Write a program to display reverse string.
3. Write a program to find the sum of digits of a given number.
4. Write a program to display a multiplication table.
5. Write a program to display all prime numbers between 1 to 1t000.
6. Write a program to insert element in existing array.
7. Write a program to sort existing array.
8. Write a program to create object for Tree Set and Stack and use all methods.
9. Write a program to check all math class functions.
10. Write a program to execute any Windows 95 application (Like notepad, calculator etc.)
11. Write a program to find out total memory, free memory and free memory after executing garbage Collector (gc).

**Part B**

1. Write a program to copy a file to another file using Java to package classes. Get the file names at run time and if the target file is existed then ask confirmation to overwrite and take necessary actions.
2. Write a program to get file name at runtime and display number f lines and words in that file.
3. Write a program to list files in the current working directory depending upon a given pattern.
4. Create a text field that allows only numeric value and in specified length.
5. Create a Frame with 2 labels, at runtime display x and y command-ordinate of mouse pointer in the labels.

**Integral University, Lucknow**

**Department of Computer Science & Engineering**

**B.Tech. (CSE) CTIS, 2nd Year/3rd Semester**

**Subject Name: Information Security Fundamentals Lab, Subject Code: CS-237**

**w.e.f. July-2017**

**L T P C**

**0 0 2 1**

**List of Lab programs**

1. System Security Configuration in Windows 7 I

2. System Security Configuration in Windows 7 II

3. Password based Authentication process

4. Hashes and message digests calculation using has calculators

5. Service Management of Windows 7 for prevention of attacks

6. Password cracking tool usage

7. Event logger analysis

8. Windows Registry analysis

9. Securing LAN using firewall

10. DoS attacks and its prevention

11. Install a key logger , capture useful information and analyse.

12. Usage of vulnerability assessment tool (nmap / wireshark) and analyze the results.