Kurukshetra University, Kurukshetra

('A+' Grade, NAAC Accredited)

Bachelor of Technology (Information Technology)
Credit-Based Scheme of Studies/Examination(Modified)
Semester III & IV (w.e.f. session 2019-2020)

A. Definition of Credit:

1 Hour Lecture (L) per week	1 credit
1HourTutorial (T) per week	1 credit
1 Hour Practical (P) per week	0.5 credit
2 Hours Practical(Lab) per week	1 credit

B. Range of Credits:

A total credit of 160is required for a student to be eligible to get Under Graduate degreein Information Technology (IT).

C. Abbreviations Used for Various Course Codes:

BS: Basic Science Courses
ES: Engineering Science Courses
HM: Humanities and Social Sciences including Management Courses
PC: Professional Core Courses
MC: Mandatory Courses
PE: Professional Elective Courses/Program Elective Courses
OE: Open Elective Courses
PROJ: Project
IT: Information Technology (IT)
OE-IT: Open Elective Courses-Information Technology (IT)

Bachelor of Technology (Information Technology)										
Credit-Based Scheme of Studies/Examination(Modified)										
Semester III(w.e.f. session 2019-2020)										
S. No.	**Course Code**	**Subject**	**L:T:P**	**Hours/ Week**	**Credits**	**Examination Schedule (Marks)**				**Duration of Exam (Hrs)**
						Major Test	**Minor Test**	**Practical**	**Total**	
1	ES-201A	Electronics Fundamentals	3:0:0	3	3	75	25	0	100	3
2	ES-217A	Digital Electronics and logic design	3:0:0	3	3	75	25	0	100	3
3	PC-IT-205A	Data Structure	3:0:0	3	3	75	25	0	100	3
4	PC-IT-207A	Object Oriented Programming using C++	3:0:0	3	3	75	25	0	100	3
5	BS-205A	Mathematics - III	3:0:0	3	3	75	25	0	100	3
6	HM-905A	Fundamentals of Management	3:0:0	3	3	75	25	0	100	3
7	ES-211LA	Basic Electronics Lab	0:0:2	2	1	0	40	60	100	3
8	ES-213LA	Digital Electronics and logic designLab	0:0:2	2	1	0	40	60	100	3
9	PC-IT-215LA	Object Oriented Programming Lab	0:0:3	3	1.5	0	40	60	100	3
Total				**25**	**21.5**	**450**	**270**	**180**	**900**	
10	SIM-201A*	Seminar on Summer Internship	2:0:0	2	0	0	50	0	50	

***Note:**SIM-201A*is a mandatory credit-less course in which the students will be evaluated for the Summer Internship (training)undergone after 2nd semester and students will be required to get passing marks to qualify.

Bachelor of Technology (Information Technology)										
Credit-Based Scheme of Studies/Examination(Modified)										
Semester IV(w.e.f. session 2019-2020)										
S. No.	Course Code	Subject	L:T:P	Hours/ Week	Credits	Examination Schedule (Marks)				Duration of Exam (Hrs)
						Major Test	Minor Test	Practical	Total	
1	ES-IT-202A	Basics of Communication	3:0:0	3	3	75	25	0	100	3
2	PC-IT-204A	Discrete Mathematics	3:0:0	3	3	75	25	0	100	3
3	PC-IT-206A	Operating System	3:0:0	3	3	75	25	0	100	3
4	PC-IT-208A	Microprocessor Interfacing and Application	3:0:0	3	3	75	25	0	100	3
5	PC-IT-210A	Database Management Systems	3:0:0	3	3	75	25	0	100	3
6	HM-901A	Management Information system	3:0:0	3	3	75	25	0	100	3
7	PC-IT-212LA	Microprocessor Interfacing and Application Lab	0:0:3	3	1.5	0	40	60	100	3
8	PC-IT-214LA	Operating Systems Lab	0:0:3	3	1.5	0	40	60	100	3
9	PC-IT-216LA	Database Management Systems Lab	0:0:3	3	1.5	0	40	60	100	3
Total				**27**	**22.5**	**450**	**270**	**180**	**900**	
10	MC-901A*	Environmental Sciences	3:0:0	3	0	75	25	0	100	3

***MC-901A**is a mandatory credit less course in which the student will be required to get passing marks in the major test.

Note: Students be encouraged to go to 6-8 weeks summer internships mandatory during the summer break after the completion of fourth semester exams.

ES- 201A	Electronics Fundamentals						
L	T	P	Credit	Major Test	Minor Test	Total	Time
3	0	0	3	75	25	100	3 Hour
Purpose	To make the students conversant with basic fundamentals of the Electronics						
	Course Outcomes						
CO1	To introduce the students to diode and its applications						
CO2	To help students understand the working of transistor as amplifier and switch						
CO3	To familiarize about the application of transistor as an oscillator						
CO4	To aware the students about th characteristics of a Digital Data Acquisition System						

UNIT 1

Semiconductor Diode: Classification of semiconductor, PN junction diodes, VI characteristics of PN junction diode, Application of PN junction diode: Half wave, full wave and bridge type rectifier circuits;clipper circuit ; Zener and Avalanche breakdown , Zener diode , VI characteristics , Zener diode as a voltage regulator ; Light emitting Diode (LED).

UNIT 2

Transistor: Types of transistor, Characteristic of transistor in Common Base and Common Emitter configuration, Transistor load line, operating point, Faithful amplification, Stabilisation, Transistor Biasing for NPN transistor: a) Base resistor method, b) Voltage divider Method; Single Stage NPN common emitter amplifier, NPN transistor as switch.

UNIT 3

Oscillator: Tank circuit, Barkhausen Criteria, Types of transistor oscillator: Tuned collector oscillator, Colpitt's oscillator, Hartley oscillator, Phase shift oscillator, Wien Bridge oscillator, Crystal oscillator.

UNIT 4

Electronic Measurement: Elements of measurement system, Characteristics of measuring devices: Resolution, Sensitivity, Accuracy , Precision , Repeatability , Drift , Calibration, Settling time, Response time, Significant figure, Threshold , Error, Types of Error.

Transducer, classification of transducer , Characteristics of good transducer , Selection criteria of transducer for measurement;Construction and working of a) LVDT b) Thermocouple; Block diagram of Digital Data Acquisition System.

Suggested books

- Boylstead , Nashelsky , "Electronic Devices and Circuit Theory" , PHI
- Bhargav , Kulshreshtha , "Basic Electronics and Linear Circuits" , Tata McGraw Hill
- Sanjay Sharma, "Electronic Devices and Circuits" , SK Kataria and sons
- J.B Gupta , " Electronic and Electrical Measurements and Instrumentation " , SK Kataria

Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

ES-217A	Digital Electronics and Logic Design						
L	T	P	Credit	Major Test	Minor Test	Total	Time
3	0	0	3	75	25	100	3 Hour
Purpose	To provide the conceptual knowledge about the design of digital circuits						
	Course Outcomes						
CO1	To introduce Simplification of switching functions using K map and QM methods						
CO2	To familiarize students with combinational circuit design						
CO3	Digital circuit design using sequential method						
CO4	To brief students how to change analog data into digital and vice versa.						

UNIT 1

Fundamentals of Digital Techniques: Review of logic gates and number system; 1's and 2's compliment Arithmetic; Introduction to Boolean algebra using basic postulates and theorems; Binary codes: BCD, Excess-3, Gray codes; Standard representation of logic functions: SOP and POS forms; Simplification of switching functions using K map and Quine-McCluskey methods.

UNIT 2

Design of Combinational circuits: Half and Full Adders;Half and Full Subtractors; Multiplexers and Demultiplexers / Decoders;Implementation of SOP logic functions using multiplexers and Demultiplexers / Decoders; Encoders. Decoders / Drivers for display devices, code converters.

UNIT 3

Sequential circuits: Latches, Flip Flops: S-R- J-K. T, D, master-slave, edge triggered flip flop;Race around condition; Excitation table; Interconversion among flip flop, Design of Synchronous and Asynchronous counters; Modulo N counter design; Shift registers.

UNIT 4

A/D and D/A converters: Sample and hold circuit, Quantization , weighted resistor and R -2 R ladder Digital to Analog Converters, Specifications for D/A converters., Flash type Analog to digital Converter; Successive approximation type Analog to digital Converter, specifications of ADCs.

Programmable Logic Devices:

Introduction to PLA and PAL, Implementation of simple functions using PLA and PAL.

Suggested Books

- R. P. Jain , "Modem Digital Electronics (Edition III)"; TMH
- Anand Kumar , "Fundamentals of digital circuits" ; PHI
- Malvino & Leach, "Digital Principles and Applications", McGraw Hill.
- Thomas L. Floyd, "Digital Fundamentals", Pearson Education Inc,

Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

PC-IT-205A	Data Structures						
L	T	P	Credit	Major Test	Minor Test	Total	Time
3	0	0	3	75	25	100	3 Hour
Purpose	To introduce the principles and paradigms of Data Structures for design and implement the software systems logically and physically						
	Course Outcomes						
CO1	To introduce the basic concepts of Data structure, basic data types, searching and sorting based on array data types.						
CO2	To introduce the structured data types like Stacks, Queue, and its basic operations' implementation.						
CO3	To introduces dynamic implementation of linked list.						
CO4	To introduce the concepts of Tree and graph and implementation of traversal algorithms.						

UNIT 1

Introduction to Data Structures: Definition & abstract data types, Real life applications with example; built in and user defined data structures.

Arrays: Definition, implementation, lower bound, upper bound, addressing an element at a particular index for one dimensional arrays, Two dimensional arrays and Multidimensional arrays. Implementation of Data Structures like structure, Sparse matrices: implementation of transpose.

Sorting &Searching: Basic Searching techniques (Linear & binary), Introduction to Sorting. Sorting using selection, insertion, bubble, merge, quick, radix, heap sort.

UNIT 2

Stacks: Sequential implementation of stacks, operations, Polish-notations, Evaluation of postfix expression, Converting Infix expression to Prefix and Postfix expression, Applications.

Queues: Definition, Sequential implementation of linear queues, Operations. Circular queue: implementation (using arrays), Advantage over linear queue, Priority queues& Applications.

UNIT 3

Linked Lists: Need of dynamic data structures, Operations on lists. Dynamic implementation of linked lists, Comparison between Array and Dynamic Implementation of linked list. Linked implementation of stacks and queues. Circular lists, implementation of primitive operations. Doubly linked lists: continuous & dynamic implementation, operations.

UNIT 4

Trees: Definition, Basic terminology, Binary tree, Array and Dynamic Implementation of a binary tree, primitive operations on binary trees. External and internal nodes. Binary tree traversals: preorder, inorder and postorder traversals. Representation of infix, postfix and prefix expressions using tree, Introduction to Binary Search Trees, B trees, B+ trees , AVL Trees, threaded trees, balanced multi way search trees.

Graphs: Definition of undirected & Directed Graphs & Networks, Basic terminology, Representation of graphs,. Graph traversals, minimum-spanning trees, computer representation of graphs.

Suggested Books:

- Tenenbaum , "Data Structures" , PHI Pub.
- Aho, Hopcroft , Ullman , "Data Structures and Algorithms" , Addison-Wesley.
- Horowitz & Sahni , " Fundamentals of Data structures" , Addison-Wesley
- Robert Kruse , "Data Structures and Program Design" , PHI,
- Symour Lipschetz , " Theory & Problems of Data Structures" , TMH

Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

PC-IT-207 A	Object Oriented Programming Using C++						
L	T	P	Credit	Major Test	Minor Test	Total	Time
3	0	0	3	75	25	100	3 Hour
Purpose	To introduce the principles and paradigms of OOPS for design and implementation of Object Oriented System						
	Course Outcomes						
CO1	To introduce the basic concepts of object oriented programming language and the its representation						
CO2	To allocate dynamic memory, access private members of class and the behavior of inheritance and its implementation.						
CO3	To introduce polymorphism, interface design and overloading of operator.						
CO4	To handle backup system using file, general purpose template and handling of raised exception during programming						

UNIT 1

Introduction to C++: C++ Standard Library, Basics of a Typical C++ Environment, Pre-processors Directives, Illustrative Simple C++ Programs. Header Files and Namespaces, libraryfiles, Concept of objects, basic of object modeling, object classes, associations, behaviors, description, Object Oriented Analysis & Object Modeling techniques,.

Object Oriented Concepts : Introduction to Objects and Object Oriented Programming, Encapsulation (Information Hiding), Access Modifiers: Controlling access to a class, method, or variable(public, protected, private, package), Other Modifiers, Polymorphism: Overloading, Inheritance, Overriding Methods, Abstract Classes, Reusability, Class's Behaviors.

Classes and Data Abstraction: Introduction, Structure Definitions, Accessing Members of Structures, Class Scope and Accessing Class Members, Separating Interface from Implementation, Controlling Access Function And Utility Functions, Initializing Class Objects: Constructors, Using Default Arguments With Constructors, Using Destructors, Classes: Constructor(Constant) Object and Constructor Member Functions, Object as Member of Classes, Friend Function and Friend Classes, Using This Pointer, Dynamic Memory Allocation with New and Delete, Static Class Members, Container Classes And Integrators, Proxy Classes, Function overloading.

UNIT 2

Operator Overloading: Introduction, Fundamentals of Operator Overloading, Restrictions On Operators Overloading, Operator Functions as Class Members vs. as Friend Functions,Overloading, <<, >> Overloading Unary Operators, Overloading Binary Operators.

Inheritance: Introduction, Inheritance: Base Classes And Derived Classes, Protected Members, Casting Base- Class Pointers to Derived- Class Pointers, Using Member Functions, OverridingBase –Class Members in a Derived Class, Public, Protected and Private Inheritance, Using Constructors and Destructors in derived Classes, Implicit Derived –Class Object To Base- Class ObjectConversion, Composition Vs. Inheritance.

UNIT 3

Virtual Functions and Polymorphism: Introduction to Virtual Functions, Abstract Base Classes And Concrete Classes, Polymorphism, New Classes And Dynamic Binding, Virtual Destructors, Polymorphism, Dynamic Binding.

Files and I/O Streams: Files and Streams, Creating a Sequential Access File, Reading Data From A Sequential Access File, Updating Sequential Access Files, Random Access Files, Creating ARandom Access File, Writing Data Randomly To a Random Access File, Reading Data Sequentially from a Random Access File. Stream Input/Output Classes and Objects, Stream Output,Stream Input, Unformatted I/O (with read and write).

UNIT 4

Templates & Exception Handling: Function Templates, Overloading Template Functions, Class Template, Class Templates and Non-Type Parameters, Templates and Inheritance, Templates and Friends, Templates and Static Members, Basics of C++ Exception Handling: Try Throw, Catch, Throwing an Exception, Catching an Exception, Re-throwing an Exception, Exception specifications, Processing Unexpected Exceptions, Constructors, Destructors and Exception Handling, Exceptions and Inheritance.

Suggested Books:

- Deitel , "C++ How to Program" , Prentice Hall
- Robert Lafore, "Object Oriented Programming in Turbo C++" , The Waite Group Press.
- Ravichandran , "Programming with C++" , 2003, TMH
- Balagurusamy , "Object oriented Programming with C++", Tata McGraw-Hill

Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

BS-205A	Mathematics-III						
Lecture	**Tutorial**	**Practical**	**Credit**	**Theory**	**Sessional**	**Total**	**Time**
3	**0**	**0**	**3.0**	**75**	**25**	**100**	**3 Hour**
Purpose	To familiarize the prospective engineers with techniques in sequence and series, multivariable calculus, and ordinary differential equations.						
Course Outcomes (CO)							
CO1	To develop the tool of sequence, series and Fourier series for learning advanced Engineering Mathematics.						
CO2	To introduce effective mathematical tools for the solutions of differential equations that model physical processes.						
CO3	To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage.						
CO4	To familiarize the student with calculus of vector functions that is essential in most branches of engineering.						

UNIT-I

Sequence and Series: Convergence of sequence and series, tests for convergence (Comparison test, D'Alembert's Ratio test, Logarithmic test, Cauchy root test, Raabe's test).

Fourier series: Introduction, Fourier-Euler Formula, Dirichlet's conditions, Change of intervals, Fourier series for even and odd functions, Half range sine and cosine series.

UNIT-II

First order ordinary differential equations: Exact, linear and Bernoulli's equations, Euler's equations, Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

Differential equations of higher orders:

Second order linear differential equations with constant coefficients, method of variation of parameters, Cauchy and Legendre's linear differential equations.

UNIT-III

Multivariable Calculus (Integration): Multiple Integration: Double integrals (Cartesian), change of order of integration in double integrals, Change of variables (Cartesian to polar) Applications: areas and volumes; Triple integrals (Cartesian), orthogonal curvilinear coordinates, Simple applications involving cubes, sphere and rectangular parallelepipeds.

UNIT-IV

Vector Calculus: Introduction, Scalar and Vector point functions, Gradient, divergence and Curl and their properties, Directional derivative. Line integrals, surface integrals, volume integrals, Theorems of Green, Gauss and Stokes (without proof).

Suggested Books:

- G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
- Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
- Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
- N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2010.
- B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.
- W. E. Boyce and R. C. DiPrima, Elementary Differential Equations and Boundary Value Problems, 9th Edition, Wiley India, 2009.
- S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.
- E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall India, 1995.
- E. L. Ince, Ordinary Differential Equations, Dover Publications, 1958.
- G.F. Simmons and S.G. Krantz, Differential Equations, Tata McGraw Hill, 2007.

Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

HM - 905A	Fundamentals of Management						
L	T	P	Credit	Major Test	Minor Test	Total	Time
3	0	0	3	75	25	100	3 Hour
Purpose	To enhance the knowledge about the basic management concepts so that engineers can apply their managerial skills.						
	Course outcomes						
CO1	An overview about Business Environment and its Components.						
CO2	Understand the concept of Financial Management and its importance.						
CO3	Enabling the students to know about the hiring and guiding the work force by the understanding of Human Resource Management.						
CO4	To understand the concept of economical production aspects of Management.						

UNIT 1

Business Environment: Concept, nature and objectivesof business, social responsibility of business, Constituent of Business Environment; Economic, Social, Political, Legal and technological. Definition, Nature and Significance of Management, Henry Fayol's Principles of Management, Functions of Management.

UNIT 2

Financial Management: Introduction of Financial Management, Objectives of Financial Decisions, Financial Planning-Tools of financial planning, Management of working capital, factors affecting requirements of working capital. Capital Structure decisions. Features of appropriate capital structure. Sources of finance.

UNIT 3

Personnel Management: Personnel Management-Meaning, Nature and importance, Functions of Personnel Management (a) Managerial Functions and (b) Operative functions. Job Analysis; Meaning and importance; Process of Job Analysis, Job Description and Job Specification. Human Resource Development-Meaning and Concept.

UNIT 4

Production Management: Production Management: Definition and objectives. Plant Location: Ideal plant location, Factors affecting plant location. Plant Layout: Ideal plant layout, Factors affecting Plant layout. Work Measurement: Meaning Objectives and Essentials of work measurement. Production Control: meaning and Importance of production control and steps involved in production control, Nature, scope and importance of Marketing Management, Modern Marketing concepts. Role of marketing in economics development. Marketing Mix. Marketing Information System. Meaning, nature and scope of International Marketing.

Suggested Books:

- Charunilam , "Business Environment" , Himalaya Publishing House
- Harold, Koontz & Cyriol ,"Mangement" , MGH
- Principles of Personnel Management-Edwin B.PhilpoMGH
- Cundiff &Stiff , "Basic Marketing" PHI

Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

ES- 211LA	Basic Electronics Lab						
L	T	P	Credit	Practical	Minor Test	Total	Time
0	0	2	1.0	60	40	100	3h
Purpose	To give hands on experience to students with electronic devices						
	Course Outcomes						
CO1	To introduce students with CRO						
CO2	To familiarize students with characteristics of Diode and transistor						
CO3	To implement Zener diode as a voltage regulator						
CO4	Measurement of displacement using LVDT						

LIST OF EXPERIMENTS

1. To study CRO
2. To plot the VI characteristics of PN junction diode
3. To plot the VI characteristics of Zener diode.
4. To study the half and full wave rectifier
5. To study the Bridge rectifier.
6. To plot the VI characteristics of transistor in CB mode
7. To plot the VI characteristics of transistor in CE mode
8. To study Zener diode as a voltage regulator
9. To study RC oscillator
10. To study single stage CE amplifier
11. To study LVDT for linear displacement

.

NOTE: A student has to perform at least ten experiments. Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

ES- 213LA	Digital Electronics Lab						
L	T	P	Credit	Practical	Minor Test	Total	Time
0	0	2	1.0	60	40	100	3h
Purpose	To implement theoretical digital electronics into practical circuits						
	Course Outcomes						
CO1	To verify the truth table for various gates.						
CO2	To Implement the Boolean Expression to design circuit for any function.						
CO3	To learn the various methods for counter design						
CO4	To design state machine circuits using sequential circuits.						

LIST OF EXPERIMENTS

1. Study of TTL gates – AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.
2. Design & realize a given function using K-maps and verify its performance.
3. To verify the operation of multiplexer & Demultiplexer.
4. To verify the operation of comparator.
5. To verify the truth tables of S-R, J-K, T & D type flip flops.
6. To verify the operation of bi-directional shift register.
7. To design & verify the operation of 3-bit synchronous counter.
8. To design and verify the operation of synchronous UP/DOWN decade counter using J K flipflops & drive a seven-segment display using the same.
9. To design and verify the operation of asynchronous UP/DOWN decade counter using J K flipflops & drive a seven-segment display using the same.
10. To design & realize a sequence generator for a given sequence using J-K flip-flops.
11. Study of CMOS NAND & NOR gates and interfacing between TTL and CMOS gates.
12. Design a 4-bit shift-register and verify its operation.

Note: A student has to perform at least ten experiments. Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus

PC-IT-215LA	Object oriented Programming Lab						
L	**T**	**P**	**Credit**	**Practical**	**Minor Test**	**Total**	**Time**
0	**0**	**3**	**1.5**	**60**	**40**	**100**	**3h**
Purpose	**To design and implement the Object Oriented System**						
	Course Outcomes						
CO1	To familiarize with the class and objects						
CO2	To implement the concept of constructors						
CO3	To familiarize the concept of operator overloading						
CO4	To implement the concepts of Inheritance						

LIST OF EXPERIMENTS

1. Raising a number n to a power p is the same as multiplying n by itself p times. Write a function called power ( ) that takes a double value for n and an int value for p, andreturns the result as double value. Use a default argument of 2 for p, so that if this argument is omitted, the number will be squared. Write a main ( ) function that gets values fromthe user to test this function.

2. A point on the two two numbers can represent dimensional plane: an X coordinate and a Y coordinate. For example, (4,5) represents a point 4 units to the right of theorigin along the X axis and 5 units up the Y axis. The sum of two points can be defined as a new point whose X coordinate is the sum of the X coordinates of the points and whoseY coordinate is the sum of their Y coordinates. Write a program that uses a structure called point to model a point. Define three points, and have the user input values to two ofthem. Than set the third point equal to the sum of the other two, and display the value of the new point. Interaction with the program might look like this:
Enter coordinates for P1: 3 4
Enter coordinates for P2: 5 7
Coordinates of P1 + P2 are: 8, 11

3. Create the equivalent of a four function calculator. The program should request the user to enter a number, an operator, and another number. It should then carry out thespecified arithmetical operation: adding, subtracting, multiplying, or dividing the two numbers. (It should use a switch statement to select the operation). Finally it should displaythe result. When it finishes the calculation, the program should ask if the user wants to do another calculation. The response can be 'Y' or 'N'. Some sample interaction with theprogram might look like this.
Enter first number, operator, second number: 10/ 3
Answer = 3.333333
Do another (Y/ N)? Y
Enter first number, operator, second number 12 + 100
Answer = 112
Do another (Y/ N) ? N

4. A phone number, such as (212) 767-8900, can be thought of as having three parts: the area code (212), the exchange (767) and the number (8900). Write a program that
uses a structure to store these three parts of a phone number separately. Call the structure phone. Create two structure variables of type phone. Initialize one, and have the user
input a number for the other one. Then display both numbers. The interchange might look like this:
Enter your area code, exchange, and number: 415 555 1212
My number is (212) 767-8900
Your number is (415) 555-1212

5. Create two classes DM and DB which store the value of distances. DM stores distances in metres and centimeters and DB in feet and inches. Write a program that canread values for the class objects and add one object of DM with another object of DB. Use a friend function to carry out the addition operation. The object that stores the resultsmaybe a DM object or DB object, depending on the units in which the results are required. The display should be in the format of feet and inches or metres and cenitmetresdepending on the object on display.

PC-IT-215LA……..

6. Create a class rational which represents a numerical value by two double values- NUMERATOR & DENOMINATOR. Include the following public member Functions:
• constructor with no arguments (default).
• constructor with two arguments.
• void reduce( ) that reduces the rational number by eliminating the highest common factor between the numerator and denominator.
• Overload + operator to add two rational number.
• Overload >> operator to enable input through cin.
• Overload << operator to enable output through cout.
Write a main ( ) to test all the functions in the class.

7. Consider the following class definition
class father {
protected :int age;
public;
father (int x) {age = x;}
virtual void iam ( )
{ cout<< "I AM THE FATHER, my age is : "<< age<< end1:}
};
Derive the two classes son and daughter from the above class and for each, define iam ( ) to writeour similar but appropriate messages. You should also define suitable constructors for theseclasses.Now, write a main ( ) that creates objects of the three classes and then calls iam ( ) for them.Declare pointer to father. Successively, assign addresses of objects of the two derived classes tothis pointer and in each case, call iam ( ) through the pointer to demonstrate polymorphism inaction.

8. Write a program that creates a binary file by reading the data for the students from the terminal.
`The data of each student consist of roll no., name (a string of 30 or lesser no. of characters) and marks.

9. A hospital wants to create a database regarding its indoor patients. The information to store include
a) Name of the patient
b) Date of admission
c) Disease
d) Date of discharge
Create a structure to store the date (year, month and date as its members). Create a base class to store the above information. The member function should include functions to
enter information and display a list of all the patients in the database. Create a derived class to store the age of the patients. List the information about all the to store the
age of the patients. List the information about all the pediatric patients (less than twelve years in age).

NOTE: A student has to perform at least ten experiments. Six experiments should be performed from the above list. Remaining four experiments may be performed as per relevance with the field of data structures within the scope of the syllabus.

ES-IT-202A	Basics of Communication						
L	T	P	Credit	Major Test	Minor Test	Total	Time
3	0	0	3	75	25	100	3 Hour
Purpose	To provide the basic knowledge of electronic communication						
	Course Outcomes						
CO1	To introduce the students to the concept of communication.						
CO2	To study signal modulation.						
CO3	To educate about the various demodulation techniques in digital communication						
CO4	To understand various methods for data transmission.						

UNIT 1

Introduction: What is communication, Elements of communication system, classification of signal, Concept of bandwidth, sources of signal, Types of communication channels, classification of electronic communication system, Limitations of communication system, Electromagnetic spectrum for communication, Gain attenuation and Decibels of a system, Noise, Classification of noise.

UNIT 2

Signal Modulation : What is modulation, Need for modulation, Amplitude Modulation, modulation index, power relation in AM, Generation of AM using collector modulation method; Frequency Modulation , modulation index in FM ; Generation of FM using Armstrong method; Comparison of AM and FM.

UNIT 3

Radio receiver: AM demodulator using diode detector, FM demodulation using slope detector method, Tuned frequency receiver, Superheterodyne receiver; RF amplifier; IF amplifier; Image frequency;Double spotting, Superheterodyne tracking.

UNIT 4

Optical Communication

Basic fiber optic system, Advantages and disadvantages of optical fibers, Classification of optical fiber, construction of fiber cable, Numerical aperture, losses in fiber optic system, Major requirements for optical fiber emitter, Advantages of LED as a source, Performance Requirements of detectors.

Suggested Books:

- George Kennedy,"Electronic Communication System", Mc Graw Hill.
- Sanjay Sharma , " Digital communication" , SK Kataria and sons
- Anokh Singh, "Principles of Communication engineering" , S Chand &Co.
- Sarkar, "Optical Electronics and fiber optic Communication", New Age International

Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

PC-IT-204A	Discrete Mathematics						
L	T	P	Credit	Major Test	Minor Test	Total	Time
3	0	0	3	75	25	100	3 Hour
Purpose	To provide the conceptual knowledge of Discrete structure.						
	Course Outcomes						
CO1	To study various fundamental concepts of Set Theory and Logics.						
CO2	To study and understand the Relations, diagraphs and lattices.						
CO3	To study the Functions and Combinatorics.						
CO4	To study the Algebraic Structures.						

UNIT 1

Set Theory & Logic Fundamentals: Sets and subsets, Venn Diagrams, Operations on sets, Laws of Set Theory, Power Sets and Products, Partition of sets, The Principle of Inclusion-Exclusion.Logic : Propositions and Logical operations, Truth tables, Equivalence, Implications, Laws of Logic, Normal forms, Predicates and quantifiers, Mathematical Induction.

UNIT 2

Relations, Diagraphs and lattices Product sets and partitions, relations and diagraphs, paths in relations and diagraphs, properties of relations, equivalence and partially ordered relations, computer representation of relations and diagraphs, manipulation of relations, Transitive closure and Warshall's algorithm, Posets and Hasse Diagrams, Lattice.

UNIT 3

Functions and Combinatorics : Definitions and types of functions: injective, subjective and bijective, Composition, identity and inverse, Review of Permutation and combination-Mathematical Induction, Pigeon hole principle, Principle of inclusion and exclusion, Generating function-Recurrence relations.

UNIT 4

Algebraic Structures: Algebraic structures with one binary operation -semi groups, monoids and groups, Product and quotient of algebraic structures, Isomorphism, homomorphism, automorphism, Cyclic groups, Normal sub group, codes and group codes, Ring homomorphism and Isomorphism.

Suggested Books:

- Liu , "Elements of Discrete Mathematics" , McGraw Hill
- Kolman , Ross , "Discrete mathematical structures" PHI Pvt. Ltd.
- Ralph P., Grimaldi, "Discrete and Combinatorial mathematics", Addison-Wesley
- Kenneth H.Rosen, "Discrete Mathematics and its Applications", , McGraw Hill

Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

PC-IT-206A	Operating Systems						
L	T	P	Credit	Major Test	Minor Test	Total	Time
3	0	0	3	75	25	100	3 Hour
Purpose	To familiarize how an operating system controls the computer						
	Course Outcomes						
CO1	To study about the process of Operating System and it's scheduling.						
CO2	To learn about interprocess communication and deadlocks.						
CO3	To learn about memory management and Virtual Memory.						
CO4	To learn about distributed system and file system of operating system.						

UNIT 1

Introductory Concepts: Operating System functions and characteristics, historical evolution of operating systems, Real time systems, Distributed systems, Methodologies for implementation of O/S service , system calls, system programs , interrupt mechanisms.

Processes: Processes model, process states, process hierarchies, implementation of processes, data structures used such as process table, PCB creation of processes, context switching, exit of processes.Process scheduling**:** objective, preemptive Vs non- preemptive scheduling, comparative assessment of different algorithms such as round robin, priority bases scheduling, FCFS, SJF, multiple queues with feedback.

UNIT 2

Interprocess communication: Race conditions, critical sections, problems of mutual exclusion, Peterson's solution, producer-consumer problem, semaphores, counters, monitors, message passing; Deadlocks:conditions, modeling, detection, recovery, avoidance, deadlock prevention.

UNIT 3

Memory Management: Multiprogramming with fixed partition, variable partitions, virtual partitions, virtual memory, paging, demand paging design and implementation issues in paging such as page tables ,inverted page tables, page replacement algorithms, page fault handling, working set model, local vs global allocation, page size, segmentation and paging.

UNIT 4

File Systems: File type, attributes, access and security, file operations, directory structures, path names, directory operations, implementation of file systems, implementation of file and file operations calls, implementation of directories, sharing of files, disk space management, block allocation, free space management, logical file system, physical file system.

Distributed Systems: Introduction to II/W and S/W concepts in distributed systems, Network operating systems and NFS, NFS architecture and protocol, client- server model, distributed file systems, RPC- Basic operations, parameter passing, RPC semantics

Suggested Books:

- Peterson & Silberschatz, "Operating System concepts", Addison Wesley
- Brinch, Hansen, "Operating System Principles" PHI
- Tenanbaum, "Operating System", PHI.

Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

PC-IT-208A	Microprocessor Interfacing & Application						
L	T	P	Credit	Major Test	Minor Test	Total	Time
3	0	0	3	75	25	100	3 Hour
Purpose	To learn the architecture and programming of Intel family microprocessors 8085 and its interfacing.						
	Course Outcomes						
CO1	To study the Architecture of 8085 microprocessors						
CO2	Familiarization with the instruction / commands of 8085						
CO3	Introduction to interfacing of microprocessor						
CO4	Concept of data transfer among various peripheral devices						

UNIT 1

Introduction of Microcomputer System: Architecture of Intel 8085 microprocessor, Pin description ; Internal architecture , Bus , register organization, Memory organization, Flags, stack, Timing and control unit, instruction cycle, machine cycle, Timing diagram for Fetch and Memory read / write .

UNIT 2

Programming of 8085: Instruction and data formats; Instruction Set of 8085; introduction to Assembly Language Programming**;** Stacks and Subroutines; counter and time delay.

UNIT 3

Interfacing I/O devices: Basic interfacing concept; Interfacing output displays; Interfacing input devices; Memory Mapped I/O ; Interrupt structure of 8085

UNIT 4

Peripheral devices: An introduction to following devices: a) Programmable Peripheral Interface (8255); b) DMA controller (8237); c) Programmable keyboard / Display interface (8279)

Microprocessor application: Interfacing of LCD, matrix keyboard, Introduction to Microprocessor Controlled Temperature System (MCTS)

Suggested Books

- Gaonkar, "Microprocessor Architecture, Programming & Application with the 8085", Penram International Publishing (India).
- B Ram , “Fundamentals of Microprocessors And Microcontrollers” , Dhanpat Rai & sons
- Ray and Bhurchandi, “Advanced Microprocessors and Peripherals”, Tata McGraw-Hill
- Udaya Kumar ,“The 8085 Microprocessor: Architecture, Programming and Interfacing” , Pearson education

Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

PC - IT-210A	Data Base Management Systems						
L	T	P	Credit	Major Test	Minor Test	Total	Time
3	0	0	3	75	25	100	3 Hour
Purpose	To familiarize the students with Data Base Management system						
	Course Outcomes						
CO1	To provide introduction to relational model.						
CO2	To learn about ER diagrams and SQL.						
CO3	To understand about the concept of functional dependencies.						
CO4	To understand about Query Processing and Transaction Processing.						

UNIT I

Introduction: Concept & Overview of DBMS, Advantages of DBMS over file processing system, Database Languages, Responsibilities of Database Administrator, Database Users, Three Schema architecture of DBMS & Data Independence, Data Models.

Entity-Relationship Model: Basic concepts, Mapping Constraints, Keys, Entity-Relationship Diagram, Weak Entity Sets, Extended E-R features: Specialization and Generalization.

UNIT 2

The Relational Data Model &Algebra: Relational Model: Structure of relational Databases, Relational Algebra & various operations (Set operation, select, project, joins, division), Relational Calculus: Domain, Tuple.

Integrity Constraints & Introduction to Sql:-

Domain Constraints, Referential Integrity Constraints, Basic Structure & Concept of DDL, DML, DCL, Aggregate Functions, Null Values, Introduction to views, creating, modifying and deleting views.

UNIT 3

Relational Database Design : Functional Dependency, Different anomalies in designing a Database., Normalization – 1NF, 2NF, 3NF, Boyce-Codd Normal Form, Normalization using multivalued dependencies, 4NF, 5NF.

UNIT 4

Transaction Processing Concept: Introduction to transaction processing, transaction model properties, serializability:- Serial, non-serial and Serializable Schedules, Conflict Serializability.

Concurrency Control: Need of concurrency control, Different concurrency control Techniques: locking based, timestamps based technique. Deadlock handling and Recovery Techniques:- Deferred update/ immediate update, shadow paging.

Suggested Books:

- Elmasri and Navathe , “Fundamentals of Database Systems” , Addision-Wesley,
- Silberschatz, and Korth ,”Database System Concepts”, McGraw-Hill
- Date , “An Introduction to Database Systems” ,Addison-Wesley,
- Bhattacharyya, “Database Management Systems” , Tata McGraw-Hill Publishing.

Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

HM-901A	Management Information System						
L	T	P	Credit	Major Test	Minor Test	Total	Time
3	0	0	3	75	25	100	3 Hour
Purpose	To familiarize the students with Management Information System.						
	Course Outcomes						
CO1	To provide introduction to relational model.						
CO2	To learn about ER diagrams and SQL.						
CO3	To understand about the concept of functional dependencies.						
CO4	To understand about Query Processing and Transaction Processing.						

UNIT 1

Introduction: Definition information system, role and impact of MIS, The challenges of Information system, Nature of MIS, Characteristics of MIS, Myths regarding MIS, Requirements of MIS, Problems & Solutions in implementing MIS, Benefits of MIS, Limitations of MIS, Significance of MIS, Components of MIS. Role of MIS, Major Management challenge to building and using information system in Organization, functions of management.

UNIT 2

Information system and Organizations: The relationship between Organization and Information System, Information needs of different organization levels: Information concept as quality product, classification and value of information, methods of data and information collection. Strategic role of information system, Salient features of Organization, Information, management and decision making, How Organization affect Information Systems, How Information system affect Organization, Ethical and Social impact of information system.

UNIT 3

Business application of Information System: Foundation Concepts Information systems in Business: Information system and technology, Business Applications, Development and Management. The internetworked E-business Enterprise: Internet, and Extranet in business. Electronic Commerce System: Electronics commerce Fundamentals, Commerce Application and issues. E-business Decision Support: Decision support in E-Business, Artificial Intelligence Technologies in business.

UNIT 4

Technical Foundation of Information System: Computers and information processing, Computer Hardware, Computer software, Managing data resources, Telecommunication, Enterprise: wide computing and networking.

Strategic and Managerial Implications of Information Systems: Strategic Information System: Introduction, Characteristics of Strategic Information Systems, Strategic Information Systems (SISP), Strategies for developing an SIS, Potential Barriers to developing a Strategic Information System (SIS), Decision Support System (DSS): Decision making concepts, methods, tools and procedures. Managing Information Resources: Introduction, IRM, Principal of Managing Information Resources, IRM functions, Computer Security: Introduction, Computer Security, Types of Computer Security, Disaster Recovery Plan.

Suggested Books:

- W.S . Jawadakar, "Management Information System", McGraw Hill
- J. O. Brien, " Management Information System", TMH, New Delhi
- Uma G . Gupta, "Management Information System" Fifth Edition TMH.
- Kenneth C. Laudon, "Management Information System Organisation and Technology" TMH.

Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

PC - IT-212 LA	Microprocessors Interfacing and Application Lab						
L	**T**	**P**	**Credit**	**Practical**	**Minor Test**	**Total**	**Time**
0	**0**	**3**	**1.5**	**60**	**40**	**100**	**3Hour**
Purpose	**To write the efficient Assembly Language Program for different problem statements and implement different system interfacing.**						
	Course Outcomes						
CO1	To familiarize with 8085 microprocessor kit						
CO2	To implement 8 bit number addition						
CO3	Implementation of Programs on 8085 kit						
CO4	To implement the program for controlling stepper motor						

LIST OF EXPERIMENTS

1. Study of 8085 Microprocessor kit.

2. Write a program using 8085 and verify for:
   a. addition of two 8-bit numbers result is 8 bit
   b. addition of two 8-bit numbers result is 16 bit.

3. Write a program using 8085 and verify for:
   a. 8-bit subtraction
   b. 16-bit subtraction

4. Write a program using 8085 for multiplication of two 8- bit numbers by repeated addition method. Check for minimum number of additions and test for typical data.

5. Write a program using 8085 for multiplication of two 8- bit numbers by bit rotation method

6. Write a program using 8085 for division of two 8- bit

7. Write a program using 8085 for dividing two 8- bit numbers by bit rotation method and test for typical data.

8. Shift an 8 bit number left by 2 bits.

9. Find 2's compliment of an 8bit and 16 bit number

10. To find larger of two numbers.

11. To find square-root of a number

12. Write a program to control the operation of stepper motor using 8085

NOTE: A student has to perform at least ten experiments.Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus

PC - IT-214 LA	Operating System Lab						
L	**T**	**P**	**Credit**	**Practical**	**Minor Test**	**Total**	**Time**
0	**0**	**3**	**1.5**	**60**	**40**	**100**	**3Hour**
Purpose	**To introduce the principles and paradigms of Operating System**						
	Course Outcomes						
CO1	To implement Process Scheduling algorithms.						
CO2	To implement deadlock.						
CO3	To implement Semaphores.						
CO4	To implement the program for memory allocation.						

LIST OF EXPERIMENTS

1. WAP to implement First Come First Scheduling (FCFS).
2. WAP to implement Shortest Job First Scheduling (SJF).
3. WAP to implement Priority Based Scheduling.
4. WAP to implement Banker's Algorithm.
5. WAP to implement LRU Page replacement Algorithm.
6. WAP to implement Round Robin Scheduling.
7. WAP to implement optimal page replacement algorithm.
8. WAP to implement producer-consumer problem.
9. WAP to implement first fit method.
10. WAP to implement best fit method.
11. WAP to implement worst fit method.
12. WAP to implement counting semaphores.

NOTE: A student has to perform at least ten experiments.Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus

PC - IT-216 LA	Database Management Systems Lab						
L	**T**	**P**	**Credit**	**Practical**	**Minor Test**	**Total**	**Time**
0	**0**	**3**	**1.5**	**60**	**40**	**100**	**3Hour**
Purpose	**To implement practically the various concepts of DBMS**						
	Course Outcomes						
CO1	To understand& Implement basic DDL commands.						
CO2	To learn & Implement DML and DCL commands.						
CO3	To understand the SQL queries using SQL operators.						
CO4	To understand the concept of relational algebra and implement using examples.						

LIST OF EXPERIMENTS

1. Create a database and write the programs to carry out the following operation:
- Add , Delete and modify a record in the database
- Generate queries
- Data operations
- List all the records of database in ascending order.

2. To perform various integrity constraints on relational database.

3. Create a database and perform the following operations:-
- Arithmetic and Relational operations
- Group by & having clauses
- Like predicate for pattern matching in database

4. Create a view to display details of employees working on more than one project.

5. Create a view to display details of employees not working on any project.

6. Using two tables create a view which shall perform natural join, equi join, outer joins.

7. Write a procedure to give incentive to employees working on all projects. If no such employee found give app. Message.

8. Write a procedure for computing amount telephone bill on the basic of following conditions.
1. telephone rent Rs. 205 including first 105 free units.
2. if extra units>0 but <500 then rate is 80 paise per unit.
3. if extra units>500 then rate is Rs. 1.20 per unit.

For this purpose create a table with name, Phone No., No. of units consumed, bill amount of a customer.

9. Write a procedure for computing income tax of employee on the basic of following conditions:-
1. if gross pay<=40,000 then I.T rate is 0%.
2. if gross pay>40,000 but <60000 then I.T rate is 10%.
3. if gross pay>60,000 but <1,00,0000 then I.T rate is 20%.
4. if gross pay>1,00,0000 then I.T rate is 30%.

For this purpose create a table with name, ssn, gross salary and income tax of the employee.

10. Write trigger for before and after insertion, deletion and updation process.

NOTE: A student has to perform at least ten experiments.Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus

MC-901A	Environmental Sciences						
Lecture	**Tutorial**	**Practical**	**Credit**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**0**	**0**	**0**	**75**	**25**	**100**	**3 Hrs.**
Purpose	To learn the multidisciplinary nature, scope and importance of Environmental sciences.						
Course Outcomes (CO)							
CO1	The students will be able to learn the importance of natural resources.						
CO2	To learn the theoretical and practical aspects of eco system.						
CO3	Will be able to learn the basic concepts of conservation of biodiversity.						
CO4	The students will be able to understand the basic concept of sustainable development.						

UNIT 1

The multidisciplinary nature of environmental studies, Definition, Scope and Importance, Need for public awareness, Natural Resources: Renewable and Non-Renewable Resources: Natural resources and associated problems.

(a) Forest Resources: Use and over-exploitation, deforestation, case studies. Timber eztraction, mining, dams and their effects on forests and tribal people.
(b) Water Resources: Use & over-utilization of surface & ground water, floods, drought, conflicts over water, dams-benefits and problems.
(c) Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
(d) Food Resources: World Food Problems, changes caused by agriculture and overgazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
(e) Energy Resources: Growing energy needs, renewable & non-renewable energy sources, use of alternate energy sources. Case studies.
(f) Land Resources: Land as a resource, land, degradation, man induced landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources, Equitable use of resources for sustainable lifestyle.

UNIT II

Ecosystem-Concept of an ecosystem. Sturcture and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological Succession, Food Chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem: (a) Forest Ecosystem, (b) Grassland Ecosystem, (c) Desert Ecosystem and (d) Aquatic Ecosystems (ponds, streams, lakes, rivers, oceans, esturaries

Field Work: Visit to a local area to document Environment assets-river/forest/grassland/hill/mountain, Visit to a local polluted site-Urban /Rural Industrial/Agricultural, Study of common plants, insects and birds, Study of simple ecosystems-pond, river, hill, slopes etc. (Field work equal to 5 lecture hours).

UNIT III

Biodiversity and its conservation: Introduction, Definition: genetic, species and ecosystem diversity. Biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversityof global, National and local levels. India as a mega-diversity nation Hot spots of Biodiversity, Threats to biodiversity: Habitat loss, poaching of wild life, man-wildlife conflicts, Endangered and endemic species of India, Conservation of Biodiversity- In situ and Ex-Situ conservation of biodiversity.

Environmental Pollution Definition: Cause, effects and control measures of (a) Air Pollution (b) Water Pollution (c) Soil Pollution (d) Marine Pollution (e) Noise Pollution (f) Thermal Pollution (g) Nuclear Hazards

Solid waste management- cause, effects and control measures of urban and industrial wastes, Role of an individual in prevention of pollution, Pollution case studies, Disaster management: floods, earthquake, cyclone and landslides

UNIT IV

Social Issues and the Environment. From unsustainable to sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people: Its problems and concerns, Case Studies: Environmental ethics-issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies: Wasteland Reclamation, Consumerism and waste products, Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public Awareness, Human population and the Environment, Population growth, variation among nations, Population explosion-Family Welfare Programme, Environment and human health. Human rights, Value Education, HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and Human Health, Case Studies, Drugs and their effects; Useful and harmful drugs, Use and abuse of drugs, Stimulant and depressan drugs, Concept of drug de-addiction, Legal position on drugs and laws related to drugs.

Suggested Books

- Environmental Studies- Deswal and Deswal. Dhanpat Rai and Co.
- Environmental Science and Engineering Anandan, P. and Kumaravelan, R. 2009. Scitech Publications (India) Pvt. Ltd., India.
- Environmental Studies. Daniels Ranjit R. J. and Krishnaswamy. 2013. Wiley India.
- Environmental Science- Botkin and Keller. 2012. Wiley , India

Note: The Examiner will be given the question paper template to set the question paper.