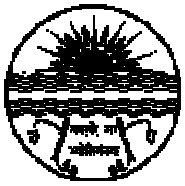

PANJAB UNIVERSITY, CHANDIGARH-160014 (INDIA)

(Estd. under the Panjab University Act VII of 1947 — enacted by the Govt. of India)

FACULTY OF SCIENCE

SYLLABI

FOR

BACHELOR OF COMPUTER APPLICATIONS

(SEMESTER SYSTEM)

FOR

EXAMINATION 2016 - 2017

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Panjab University, Chandigarh

Scheme of Examination and Syllabus of BCA w.e.f. 2016 - 17

Bachelor of Computer Applications Semester – I

Paper Code	Title	L	T		Total	Int	Ext	Total	Exam. Duration	Credits
BCA-16-101	English(Compulsory)-A	6	-	-	6	10	90	100	3 Hrs	3
BCA-16-102	Fundamentals of Mathematical Statistics	6	1	-	7	10	65	75	3 Hrs	3
BCA-16-103	Computer Fundamentals and Computing Software	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-104	Problem Solving Through C	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-105	Lab based on BCA-16-103	-	-	6	6	-	50	50	4 Hrs	2
BCA-16-106	Lab based on BCA-16-104	-	-	6	6	-	50	50	4 Hrs	2
	Environment & Road Safety Education									
	Total	**24**	**1**	**12**	**37**	**40**	**360**	**425**		**16**

Bachelor of Computer Applications Semester – II

Paper Code	Title	L	T	P	Total	Int	Ext	Total	Exam. Duration	Credits
BCA-16-201	English (Compulsory)-B	6	-	-	6	10	90	100	3 Hrs	3
BCA-16-202	Computer Organization	6	1	-	7	10	65	75	3 Hrs	3
BCA-16-203	Fundamentals of Web Programming	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-204	Object Oriented Programming using C++	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-205	Lab based on BCA-16-203	-	-	6	6	-	50	50	4 Hrs	2
BCA-16-206	Lab based on BCA-16-204	-	-	6	6	-	50	50	4 Hrs	2
	Total	**24**	**1**	**12**	**37**	**40**	**360**	**425**		**16**

*** The Environment, Road Safety Education and Violence Against Women & Children is a compulsory qualifying paper, which the students have to study in the BCA 1st year (2nd Semester). If the student/s failed to qualify the paper during the2nd Semester, he /she/they be allowed to appear/qualify the same in the 4th or 6th Semester/s.**

Third Semester						
Sr. No.	**Subject**	**LT/ Week**	**Theory Marks**	**Internal Assessment**	**Exam. Hours**	**Paper Code**
10.	Computer Based Numerical Methods	6	90	10	3	BCA-301
11.	Data Structures	6	90	10	3	BCA-302
12.	Implementation of Object Oriented concept through C++	6	90	10	3	BCA-303
13.	Computer Lab.: Based on BCA – 301, BCA – 302 and BCA – 303	12	45	05	4	BCA-304

Fourth Semester						
14.	Project Management & System Development	6	90	10	3	BCA-401
15.	Client Server Computing using ORACLE	6	90	10	3	BCA-402
16.	Understanding UNIX	6	90	10	3	BCA-403
17.	Computer Lab.: Based on BCA-402 and BCA-403	6	45	05	4	BCA-404

Fifth Semester						
Sr. No.	**Subject**	**LT/ Week**	**Theory Marks**	**Internal Assessment**	**Exam. Hours**	**Paper Code**
18.	Enterpreneurship Development Programme	4	90	10	3	BCA-501
19.	Principles of Computer Graphics & Multimedia Technology	5	90	10	3	BCA-502
20.	Discrete Mathematics in Computer Science	5	90	10	3	BCA-503
21.	Computer Lab.: Based on BCA-502	5	90	10	4	BCA-504
Sixth Semester						
22.	Web Programming	5	90	10	3	BCA-601
23.	Computer Organization	5	90	10	3	BCA-602
24	Computer Networks	5	90	10	3	BCA-603
24.	Minor Project and Seminar Based on BCA-601	5	90	10	4	BCA-604

Bachelor of Computer Applications Semester – I

Paper Code	Title	L	T		Total	Int	Ext	Total	Exam. Duration	Credits
BCA-16-101	English(Compulsory)-A	6	-	-	6	10	90	100	3 Hrs	3
BCA-16-102	Fundamentals of Mathematical Statistics	6	1	-	7	10	65	75	3 Hrs	3
BCA-16-103	Computer Fundamentals and Computing Software	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-104	Problem Solving Through C	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-105	Lab based on BCA-16-103	-	-	6	6	-	50	50	4 Hrs	2
BCA-16-106	Lab based on BCA-16-104	-	-	6	6	-	50	50	4 Hrs	2
	Environment & Road Safety Education									
	Total	**24**	**1**	**12**	**37**	**40**	**360**	**425**		**16**

Bachelor of Computer Applications Semester – II

Paper Code	Title	L	T	P	Total	Int	Ext	Total	Exam. Duration	Credits
BCA-16-201	English (Compulsory)-B	6	-	-	6	10	90	100	3 Hrs	3
BCA-16-202	Computer Organization	6	1	-	7	10	65	75	3 Hrs	3
BCA-16-203	Fundamentals of Web Programming	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-204	Object Oriented Programming using C++	6	-	-	6	10	65	75	3 Hrs	3
BCA-16-205	Lab based on BCA-16-203	-	-	6	6	-	50	50	4 Hrs	2
BCA-16-206	Lab based on BCA-16-204	-	-	6	6	-	50	50	4 Hrs	2
	Total	**24**	**1**	**12**	**37**	**40**	**360**	**425**		**16**

FIRST SEMESTER

English (Compulsory) – A
BCA-16-101

Outlines of Test, Syllabi and Courses of Reading for BCA, First Year (English Compulsory) Examination 2016-17

M.Marks: 100
Theory:90
Semester I Int.Assess:10

Book Prescribed: **Colours of Expression** by Harbhajan Singh published by Publication Bureau, Panjab University, Chandigarh

Section A

1) **Short Stories** (1& 2)
One essay type question on summary/Character/Incident
(one out of two with internal choice) **15 marks**

II) **Prose (1 to 3)**
Long essay type question on Summary/Theme
(one out of two with internal choice) **15 marks**

III) **Poetry** (1 to 6) **15 marks**
Summary (one out of two with internal choice) **5 marks**
Short Questions (two out of three) **5 marks**
Reference to the Context (one out of two with internal choice) **5 marks**

Section B

1) Word formation from Prose and Stories and their use in sentences (5 out of 8) **10 marks**
2) Use of textual words and idioms in sentences (5 out of 8) **10 marks**
3) Translation from Hindi/Punjabi to English **10 marks**
(a small Paragraph)
OR
For Foreign Students (Paraphrase of Poetry Passage)
4) Official, Business and Letters to the Editors **15 marks**

Fundamentals of Mathematical Statistics
BCA-16-102

L	T	P	Cr	External Marks: 65
6	1	-	3	Internal Marks: 10

Time Duration: 3 Hrs. Number of Lectures : 60

Objective: To teach the students the basic techniques of Statistical Methods. After completing this course students will be able to solve various Financial, Scientific and Engineering fields' problems.

Note :

i. The Question Paper will consist of Four Sections.
ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
iv. All questions carry equal marks unless specified.
v. **The student can use only Non-programmable & Non-storage type of Calculator.**
vi. **Log tables are allowed. Students may be provided the same for computation.**

SECTION-A

Basic Statistics: Types of Statistics, Different Statistical Techniques, Steps in Statistical Investigation, Uses and Limitations of statistics, Collection of Data: Sources of collecting primary and Secondary Data, Limitations of Secondary Data, Criteria of evaluating secondary data, Organization of data, Graphs of Grouped Frequency Distribution, Tabulation of Data, Parts of Table

Measures of Central Tendency: Kinds of measures of central tendency (statistical averages or averages):

Arithmetic Mean: Simple Arithmetic Mean, Methods of calculating Simple Arithmetic Mean, Arithmetic Mean in case of Individual Series, Discrete series and continuous series, Weighted Arithmetic Mean, Combined Arithmetic Mean.

Geometric Mean: Simple Geometric Mean , Methods of calculating Simple Geometric Mean, Geometric Mean in case of Individual Series, Discrete series and continuous series, Weighted Geometric Mean, Combined Geometric Mean.

Harmonic Mean: Simple Harmonic Mean ,Methods of calculating Simple Harmonic Mean, Harmonic Mean in case of Individual, Discrete series and continuous series, Weighted Harmonic Mean, Combined Harmonic Mean.

SECTION-B

Median: Methods of Calculating Median in case of Individual, Discrete series and continuous series

Partition Value: Quartile, Quintiles, Hexiles, Septiles, Octiles, Deciles, Percentiles

Mode: Methods of Calculating Mode in case of Individual Series, Discrete series and continuous series

Range: Computation of Range, Inter Quartile Range, Computation of Inter Quartile Range, Percentile Range and Computation of Percentile Range.

Mean Deviation, Computation of Mean Deviation, Standard Deviation, Calculation of Standard Deviation, Variance, Calculation of Standard Deviation for individual Series, Discrete Series and Continuous Series, Coefficient of Standard Deviation and coefficient of variation, Combined Standard Deviation, Correcting incorrect Standard Deviation

SECTION-C

Correlation Analysis : Correlation Analysis: Definition, Types of Correlation: Positive, Negative, Simple, Multiple, Partial, Total, Linear and Non-Linear. Need of Correlation Analysis, Correlation and Causation, Techniques for Measuring Correlation: Scatter Diagram Method, Graphic Method, Karl Pearson's Coefficient of Correlation: Correcting incorrect coefficient of correlation, calculating Karl Pearson's coefficient of correlation in case of grouped series, Probable Error, Coefficient of Determination, Spearman's coefficient of Correlation (Rank correlation): Calculation of Correct Coefficient of rank correlation, Difference between Rank Coefficient and Karl Pearson's coefficient of coefficient, Coefficient of concurrent deviation.

SECTION-D

Regression Analysis (Linear Regression): Definition, Difference between Correlation and Regression, Types of Regression Analysis: Simple, Multiple, Partial, Total, Linear and Non-Linear, Objectives of Regression Analysis, Methods of obtaining regression analysis: Regression Lines, Regression Equations. Methods of obtaining regression equations: Normal Equations and Regression Coefficient, Properties of Regression Coefficient, Standard Error of Estimate, Regression Coefficient in case of Grouped Data, Uses of Regression Analysis and Limitations of Regression Analysis.

Reference Books:

1. Gupta S.C, Kapoor V.K. : Fundamentals of mathematical Statistics, Sultan Chand & Sons.
2. Gupta, S.P., 2003 : Statistical Methods, S. Chand.
3. Affi, A.A, 1979 : Statistical Analysis: A Computer Oriented Approach, Academic Press, Inc.

Computer Fundamentals and Computing Software

BCA-16-103

L	T	P	Cr	External Marks: 65
6	-	-	3	Internal Marks: 10

Time Duration: 3 Hrs. Number of Lectures : 60

Objectives: The objective of this course is to familiarize students with computer fundamentals and the commonly used computing software.

Note:

i. The Question Paper will consist of Four Sections.
ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
iv. All questions carry equal marks unless specified.

SECTION – A

Computer Appreciation: Introduction to computers, characteristics of computer; History of computers; Classification of computers on size: Micro, Mini, Mainframe and super computers, Working Principles, Generations; Applications of computers; commonly used terms–Hardware, Software, Firmware; Basic Computer Organization: Block diagram of computer system, Input unit, Processing Unit and Output Unit; Description of Computer input devices: Keyboard, Mouse, Trackball, Pen, Touch screens, Scanner, Digital Camera; Output devices: Monitors, Printers, Plotters.

Computer Memory: Representation of information: BIT, BYTE, Memory, Memory size; Units of measurement of storage; Main memory: Storage evaluation criteria, main memory organization, RAM, ROM, PROM, EPROM; Secondary storage devices: Sequential Access Memory, Direct Access Memory Magnetic Tapes, Magnetic disks, Optical disks: CD, DVD; Memory storage devices: Flash Drive, Memory card;

Types of software: System and Application software; Programming Languages: Generation of Languages; Translators - Interpreters, Compilers, Assemblers and their comparison.

SECTION – B

Understanding Operating System using DOS : Introduction to operating systems and its functions, DOS and versions of DOS, Booting sequence; Warm and Cold Boot; Concepts of files and directories, Redirecting command input and output using pipes, Wildcard characters, Types of DOS commands: Internal and External; Internal Commands: DIR, MD, CD, CLS, COPY, DATE, DEL, PATH, PROMPT, REN, RD, TIME, TYPE, VER, VOL; External Commands: XCOPY, ATTRIB, BACKUP, RESTORE, FIND, SYS, FORMAT, CHKDSK, DISKCOPY, LABEL, MOVE, TREE, DELTREE, DEFRAG, SCANDISK, UNDELETE. Batch Files: Introduction to simple batch files; Introduction to CONFIG.SYS and AUTOEXEC.BAT files.

Understanding Graphical User Interface using Windows: Fundamentals of Windows, Types of Windows, Anatomy of windows, Icons, Recycle bin, Operations on Folders, Registry of Windows: Basics, Editing; Control panel.

SECTION-C

Word Processing Package: Opening, saving and closing an existing document; renaming and deleting files; Using styles and templates: Introduction to templates and styles; applying, modifying and creating new (custom) styles; using a template to create a document, creating a template, editing a template, organizing templates, examples of style use, Changing document views, Moving quickly through a document, Working with text: select, cut, copy, paste, find and replace, inserting special characters, setting tab stops and indents, Checking spelling and Grammar, Autocorrect, Using built-in language tools, word completion, Autotext, Formatting text: Using Styles, formatting paragraphs, formatting characters, auto-formatting, creating lists; Formatting pages: Using layout methods, creating headers and footers, Numbering pages, Changing page margins, Adding comments to a document, Creating a table of contents, Creating indexes and bibliographies, Printing a document, Using mail merge, Tracking changes to a document, Using fields, Linking to another part of a document, Using master documents, Creating fill-in forms.

SECTION-D

Spreadsheet Package: Introduction to Spreadsheets, sheets and cells; Opening and saving spreadsheet files; Working with sheets: inserting new sheet, deleting and renaming sheets, Viewing a spreadsheet: freezing rows and columns, splitting screen, Entering data: cell referencing, formatting cells, entering numbers, entering numbers as text, entering formulae, entering date and time, deactivating automatic changes, Speeding up data entry: using fill tool, fill series, defining fill series, Validating cell contents, Formatting data: formatting text, numbers, cells, Autoformatting cells and sheets, defining new autoformat, Using conditional formatting, Hiding and showing data, Sorting records, Printing a spreadsheet document: using print ranges, page formats, inserting page breaks, headers and footers; Working with Graphs and Charts : Creating Embedded Chart, formatting chart: Changing chart types, adding Titles, Legends and Gridlines, Printing Charts; Adding database functions: defining database ranges, sorting, filtering and grouping database ranges; Evaluating data: using DataPilot; Functions and Macros: using and editing existing macro, Creating Macros, Recording Macros, Running Macros.

Presentation Packages: Basics of creating a presentation, Parts of main window, workspace views, creating a presentation, Incorporation of Animation.

Note: Any word processing, spreadsheet and presentation package may be used. Focus should be on open source software's.

References :

1. Basandra, S.K. : Computers Today, Galgotia.
2. Sinha P.K. & Sinha Priti : Computer Fundamentals, BPB Publications
3. Mathur Rajiv, 1995: DOS 6.2 Quick Reference, Galgotia.
4. OOoAuthors Team : Getting Started with OpenOffice.org 3.3, Friends of OpenDocument
5. Singleton, Roderick G.: OpenOffice.org User Guide.

Problem Solving Through C
BCA-16-104

L	T	P	Cr	External Marks: 65
6	-	-	3	Internal Marks: 10

Time Duration: 3 Hrs. Number of Lectures : 60

Objective: The objective of this course is to make the student understand programming language concepts using 'C' language, mainly control structures, reading a set of data, stepwise refinement, function and arrays. After completion of this course, the student is expected to analyze the real life problem and write programs in 'C' language to solve problems. The main emphasis of the course is on problem solving aspect.

Note:

i. The Question Paper will consist of Four Sections.
ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
iv. All questions carry equal marks unless specified.

SECTION A

Programming Process: Steps in developing of a program, Data Flow Diagram, Decision Table, Algorithm development, Flowchart, Pseudo Code, Testing and Debugging.

Fundamentals of C Languages: History of C, Character Set, Identifiers and Keywords, Constants, Types of C Constants, Rules for Constructing Integer, Real and character Constants, Variables, Data Types, rules for constructing variables.

Operators and Expressions: C Instructions, Arithmetic operators, Relational operators, Logical operators, Assignment Operators, Type Conversion in Assignments, Hierarchy of Operations, Standard and Formatted Statements, Structure of a C program , Compilation and Execution.

SECTION B

Decision Control Structure: Decision making with IF-statement, IF-Else and Nested IF-Else, The else if Clause.

Loop Control Structure: While and do-while, for loop and Nested for loop,

Case Control Structure: Decision using switch, goto statement.

Functions: Library functions and user defined functions, Global and Local variables, Function Declaration, Calling and definition of function, Methods of parameter passing to functions, recursion, Storage Classes in C.

SECTION C

Arrays: Introduction, Array declaration, Accessing values in an array, Initializing values in an array, Single and Two Dimensional Arrays, Initializing a 2-Dimensional Array, Memory Map of a 2-Dimensional Array, Passing array elements to a function: Call by value and call by reference, Arrays of characters, Insertion and deletion operations, Searching the elements in an array, Using matrices in arrays, Passing an Entire Array to a Function.

Pointers: Pointer declaration, Address operator "&", Indirection operator "*", Pointer and arrays, Pointers and 2-Dimensional Arrays, Pointer to an Array, Passing 2-D array to a Function, Array of Pointers.
Dynamic Memory Allocation: malloc(), calloc(), realloc(), free() functions.

SECTION D

String Manipulation in C: Declaring and Initializing string variables, Reading and writing strings, String Handlingfunctions(strlen(), strcpy(), strcmp(), strcat()).
Structures and Unions: Declaration of structures, Structure Initialization, Accessing structure members, Arrays of structure, Nested structures, Structure with pointers, Union.
Files in C: Introduction, Opening and Closing files, Basic I/O operation on files.

References:

1. Yashavant P. Kanetkar : Let us C, BPB Publications, New Delhi.
2. Salaria, R.S. : Test Your Skills in C, Salaria Publications, New Delhi.
3. C. Balaguruswami : Programming with C Language, Tata McGraw Hill, New Delhi.
4. Byron S. Gottfried : Programming in C, McGraw Hills Publishers, New York.
5. M.T. Somashekara : Programming in C, Prentice Hall of India.

SECOND SEMESTER

ENVIRONMENT, ROAD SAFETY EDUCATION AND VIOLENCE AGAINST WOMEN AND CHILDREN (SEMESTER – II)

Note: The syllabus has 15 topics to be covered in 25 hour lectures in total, with 2 lectures in each topic from 2 to 11 and one each for the topics 1 and 12 to 15.

1. Environment Concept:
Introduction, concept of biosphere – lithosphere, hydrosphere, atmosphere; Natural resources – their need and types; Principles and scope of Ecology; concepts of ecosystem, population, community, biotic interactions, biomes, ecological succession.

2. Atmosphere:
Parts of atmosphere, components of air; pollution, pollutants, their sources, permissible limits, risks and possible control measures.

3. Hydrosphere:
Types of aquatic systems; Major sources (including ground water) and uses of water, problems of the hydrosphere, fresh water shortage; pollution and pollutants of water, permissible limits, risks and possible control measures.

4. Lithosphere:
Earth crust, soil – a life support system, its texture, types, components, pollution and pollutants, reasons of soil erosion and possible control measures.

5. Forests:
Concept of forests and plantations, types of vegetation and forests, factors governing vegetation, role of trees and forests in environment, various forestry programmes of the Govt. of India, Urban Forests, Chipko Andolan.

6. Conservation of Environment:
The concepts of conservation and sustainable development, why to conserve, aims and objectives of conservation, policies of conservation; conservation of life support systems – soil, water , air, wildlife, forests.

7. Management of Solid Waste:
Merits and demerits of different ways of solid waste management– open dumping, landfill, incineration, resource reduction, recycling and reuse, vermicomposting and vermiculture, organic farming.

8. Indoor Environment:
Pollutants and contaminants of the in-house environment; problems of the environment linked to urban and rural lifestyles; possible adulterants of the food; uses and harms of plastics and polythene; hazardous chemicals, solvents and cosmetics.

9. Global Environmental Issues:
Global concern, creation of UNEP; Conventions on climate change, Convention on biodiversity; Stratospheric ozone depletion, dangers associated and possible solutions.

10. Indian Laws on Environment:
Indian laws pertaining to Environmental protection: Environment (Protection) Act, 1986; General information about laws relating to control of air, water and noise pollution. What to do to seek redressal.

11. Biodiversity:
What is biodiversity, levels and types of biodiversity, importance of biodiversity, causes of its loss, how to check its loss; Hotspot zones of the world and India, Biodiversity Act, 2002.

12. Noise and Microbial Pollution:
Pollution due to noise and microbes and their effects.

13. Human Population and Environment:
Population growth and family welfare programme, Human Health. HIV-AIDS. Human Rights.

14. Social Issues:
Environmental Ethics: Issues and possible solutions, problems related to lifestyle, sustainable development; Consumerisms and waste generation.

15. Local Environmental Issues:
Environmental problems in rural and urban areas. Problem of Congress Grass & other weeds, problems arising from the use of pesticides and weedicides, smoking etc.

Practical
Depending on the available facility in the college, a visit to vermicomposting units or any other such non-polluting eco-friendly site or planting/caring of vegetation/trees could be taken.

Examination Pattern:
A qualifying paper of 50 marks comprising of fifty multiple choice questions (with one correct and three incorrect alternatives and no deduction for wrong answer or un-attempted question), and of 1 hour duration.

The students have to obtain 33% marks to qualify the paper. The marks are not added / included in the final mark sheet.

UNIT II (ROAD SAFETY)

1. Concept and Significance of Road Safety.
2. Role of Traffic Police in Road Safety.
3. Traffic Engineering – Concept & Significance.
4. Traffic Rules & Traffic Signs.
5. How to obtain Driving License.
6. Traffic Offences, Penalties and Procedures.

7. Common Driving mistakes.
8. Significance of First-aid in Road Safety.
9. Role of Civil Society in Road Safety.
10. Traffic Police-Public Relationship.

Note : Examination Pattern :

- The Environment and Road Safety paper is 70 marks.
- Seventy multiple choice questions (with one correct and three incorrect alternatives and no deduction for wrong or un-attempted questions).
- The paper shall have two units: **Unit I (Environment) and Unit II (Road Safety).**
- Unit II shall comprise of 20 questions with minimum of 1 question from each topics 1 to 10.
- The entire syllabus of Unit II is to be covered in 10 hours.
- All the questions are to be attempted.
- Qualifying Marks 33 per cent i.e. 23 marks out of 70.
- Duration of examination: 90 minutes.
- The paper setter is requested to set the questions strictly according to the syllabus.

Suggested Readings

1. The Motor Vehicle Act, 1988 (2010), Universal Law Publishing Co. Pvt. Ltd., New Delhi.
2. Road Safety Signage and Signs (2011), Ministry of Road Transport and Highways, Government of India.

Websites:

(a) www.chandigarhpolice.nic.in

(b) www.punjabpolice.gov.in

(c) www.haryanapolice.gov.in

(d) www.hppolice.nic.in

SYLLABUS ON "VIOLENCE AGAINST WOMEN & CHILDREN" AT UNDER-GRADUATE LEVEL

UNIT III OF COMPULSORY PAPER ON ENVIRONMENT & ROAD SAFETY EDUCATION

AS PART OF SEMESTER - II

Unit – III

VIOLENCE AGAINST WOMEN & CHILDREN

1. Concept and Types of Violence: Meaning and Definition of violence; Types of Violence against women – domestic violence, sexual violence (including rape), sexual harassment, emotional/psychological violence; Types of Violence against children – physical violence, sexual violence, verbal and emotional abuse, neglect & abandonment.

2. Protective Provisions of IPC on Domestic Violence & Sexual Violence against Women:
Dowry Death – Section 304B;
Rape – Sections 375, 376(1), 376A, 376B, 376C, 376D and 376E;
Cruelty – Section 498A;
Insult to Modesty – The Indian Penal Code does not define the word eve-teasing; there are three sections which deal with crime of eve-teasing. These are Sections, 294, 354 and 509of Indian Penal Code. Section 509 of the Indian penal code defines (Word, gesture or act intended to insult the modesty of a woman), Section 294 – (Obscene acts and songs) and Section 354 (Assault or criminal force to woman with intent to outrage her modesty);
Hurt & Grievous Hurt Provisions – Sections 319 to 326;
Acid Attacks – Sections 326A and 326B;
Female Infanticide – Section 312, Section 313 of Indian Penal Code (Causing miscarriage without women's consent) and section 314;
Sexual Harassment – For providing protection to working women against sexual harassment, a new section 354 A is added; 354 B (Assault or use of criminal force to women with intent to disrobe); 354 C Voyeurism; 354 D (Stalking). All these provisions are added in IPC to protect women against acts of violence through Criminal Law (Amendment) Act, 2013; Human Trafficking and Forced Prostitution- Sections 370 and 370A

3. Protective Laws for Women:

3.1 Provisions of Protection of Women Against Domestic Violence Act 2005 – Definition, Powers of the Magistrate and Protection Officers, Protection order, Residence order, Monetary relief, Custody order and Compensatory order.

3.2 The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 – Definition, Internal Complaint Committee, Local Complaint Committee, Procedure adopted by Committee for punishing accused.
4. Protective Provisions of IPC regarding Sexual Violence against Children:
Section 293(sale etc. of obscene objects to young persons); 294 (obscene acts & songs); 305 (abetment of suicide of child); 315 to 317 (act causing death after birth of a child etc.); 361

(kidnapping from lawful guardianship); 362 (abduction); 363 (punishment for kidnapping); 363A (kidnapping or maiming a minor for purposing of begging); 364A (kidnapping for ransom etc.); 366 (kidnapping etc. to compel woman for marriage etc.); 366A (procuration of minor girl for illicit forced intercourse); 366B (importation of girl from foreign country); 367 (kidnapping/abduction in order to subject person to grievous hurt, slavery etc.); 369 (kidnapping adductive child under 10 year with intent to steal from its person); 372 & 373 (selling & buying minor for purposes of prostitution etc.).

4.1 The Protection of Children from Sexual Offences Act, 2012: An overview of the POCSO, relevant legal provisions and guidelines for the protection of children against sexual offences along with punishments; role of doctors, psychologists & mental experts as per rules of POCSO.

Note: Instructions for Examination:

- Unit III of the paper dealing with Violence against Women and Children is of 30 Marks.
- It shall have 30 multiple-choice questions (with one correct and three incorrect choice options and no deduction of marks for wrong or un-attempted questions).
- Minimum two questions from each topic must be covered.
- All the questions are to be attempted
- Qualifying Marks 33 percent
- Duration of Examination 30 Minutes
- The Paper Setter is requested to set the questions strictly according to the syllabus.

Pedagogy:

- The entire syllabus of Unit III is to be covered in ten hours in total, with each lecture of one-hour duration.
- The purpose behind imparting teaching-learning instructions is to create basic understanding of the contents of the Unit III among the students.

RELEVANT READING MATERIAL

Ahuja, Ram (1998), *Violence against Women,* New Delhi: Rawat Publication
NRHM, *Child Abuse*, A Guidebook for the Media on Sexual Violence against Children
The Indian Penal Code (Universal Law Publishing Co. Pvt. New Delhi).
The Protection of Children from Sexual Offences Act, 2012
The Protection of Women from Domestic Violence Act 2005
The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013
UNO, *United Nations Secretary-General's Study on Violence against Children*, adapted for Children and Young People

English (Compulsory) – B
BCA-16-201

M.Marks: 100

Theory: 90
Int.Assess:10

Semester II

Book Prescribed: **Colour of Expression** by Harbhajan Singh published by Publication Bureau, Panjab University, Chandigarh

Section A

1) **Short Stories** (3-5)
One essay type question on summary/Character/Incident
(one out of two with internal choice) **15 marks**

2) **Prose (4-5)**
Long essay type question on Summary/Theme
(one out of two with internal choice) **15 marks**

3) Poetry (7-11) **15marks**
Summary (one out of two with internal choice) **5 marks**
Short Questions ((two out of three) **5 marks**
Reference to the Context(one out of two with internal choice) **5 marks**

Section B

1) Paragraph Writing(Descriptive and Narrative) **10 marks**

2). Use of textual words and idioms in sentences
(5 out of 8) **10 marks**

3). Translation from Hindi/Punjabi to English **10 marks**
(isolated sentences)
OR
For Foreign Students (Paraphrase of Poetry Passage)

4) Transformation of all types (15 out of 15) **15 marks**

Computer Organization
BCA-16-202

L	T	P	Cr	External Marks: 65
6	-	-	3	Internal Marks: 10

Time Duration: 3 Hrs. Number of Lectures : 60

Objectives: This course will enable the student to understand the basic organization of computer system and system maintenance.

Note:

i. The Question Paper will consist of Four Sections.
ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
iv. All questions carry equal marks unless specified.

SECTION-A

Computer Organisation: Evolution of Computers, Von Neumann Architecture, Combinatorial Blocks : Gates, Half Adder, Full Adder, Multiplexers, Decoders, Encoders; Sequential Building blocks : Flip Flops, Registers, Counters,
Information representation: codes, fixed and floating point representation
Arithmetic: Addition and subtraction for sign magnitude and 2's complement numbers, integer multiplication using Booth's algorithms

SECTION-B

Architecture of a Simple Processor: Architecture of 8086/8088 microprocessor, instruction set, Addressing Modes.
Instruction: Microinstructions: Register Transfer, Arithmetic, Logical and Shift, Types of Instructions, Instruction Cycle.
Interrupt: Types, Interrupt Cycle
I/O organization: Strobe based and Handshake based communication, DMA based data transfer;

SECTION-C

Memory Organisation: Memory Hierarchy, RAM (Static and Dynamic), ROM Associative memory, Cache memory organisation, Virtual memory organisation.
Assembly Language : Features of Assembly Language, Machine Language vs Assembly Language, Pseudo Instruction; use of Assembly for programs: Addition, Subtraction, Multiplication using Subroutines and Basic Input/ Output.

SECTION-D

System Maintenance: Introduction to various physical components of a computer, Physical Inspection and Diagnostics on PC, Functional description of various Internal and External cards; Viruses: Types of Computer Viruses, Detection, prevention and protection from

Viruses.

References :

1. M. Morris Mano, 1993. : Computer System Architecture, Prentice Hall International, 3rd Ed.,
2. P. Pal Choudhri, 1994. : Computer Organisation and Design, Prentice Hall of India.
3. Biswal, Sadasiva, 2001 : Basic Electronics, Pub-Atlantic, New Delhi.
4. B. Govindarajalu, 1994. : IBM-PC and Clones - Hardware Troubleshooting and Maintenance, Tata-McGraw-Hill.

Fundamentals of Web Programming
BCA-16-203

L	T	P	Cr	
6	-	-	3	**External Marks: 65**
				Internal Marks: 10

Time Duration: 3 Hrs. Number of Lectures : 60

Objectives: This course will enable the student to build and publish web sites using HTML, DHTML, CSS, JavaScript and Dreamweaver.

Note :

i. The Question Paper will consist of Four Sections.
ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
iv. All questions carry equal marks unless specified.

SECTION – A

Basic terminology: Web Server; Web Client/Browser, Understanding how a Browser communicates with a Web Server, Website, Webpage, Static Website, Dynamic Website, Internet, Intranet, Extranet, WWW, URL

HTML: Structure of an HTML program, Paragraph Breaks, Line Breaks; Emphasizing Material in a Web Page (Heading Styles, Drawing Lines); Text Styles (Bold, Italics, Underline); Other Text Effects (Centering (Text, Images etc.)

Lists: Unordered List, Ordered Lists, Definition lists

Adding Graphics to HTML Documents using the Border, Width, Height, Align, ALT Attributes

Tables: Caption Tag, Width, Border, Cell padding, Cell spacing, BGCOLOR, COLSPAN and ROWSPAN Attributes.

SECTION – B

Linking Documents: Anchor tag, External Document References, Internal Document References and Image Maps

Frames: Introduction to Frames: The <FRAMESET> tag, The <FRAME> tag, Targeting Named Frames

DHTML: Introduction to cascading style sheets (CSS), Style tag, Link tag, Types of CSS: In-Line, Internal, External

Forms: Attributes of Form element, Input element, The Text Element, Password, Button, Submit Button, Reset Button, The Checkbox, Radio, TextArea, Select and Option

SECTION – C

Java Script: Introduction and Features of JavaScript, Writing JavaScript into HTML, tokens, data types, variables, operations, control constructs, strings arrays, functions, core language objects, client side objects, event handling. Applications related to client side form validation.

Other Built-In Objects in JavaScript: The String Object, The Math Object, The Date Object;

SECTION – D

Introduction to Dreamweaver: Understanding Workspace Layout, Managing Websites, Creating a Website, Using Dreamweaver Templates, Adding New WebPages, Text and Page Format, Inserting Tables, Lists, Images, Adding Links.

Web Hosting: Understanding Domain Name & Web Space, Getting a Domain Name & Web Space (Purchase or Free), Uploading the Website to Remote Server, Introduction to Open Source Third party FTP Tools

References:

1	Wanger & Wyke	:	Java Script Unleased, Pearson Education, New Delhi.
2	Bayross, Ivan :	:	HTML, DHTML, Java Script by BPB, Latest reprint
3	Schildt , Herbert	:	The Complete Reference Java 2, TMH, Latest reprint
4	Thomas Powell	:	HTML & CSS: The Complete Reference
5	John Pollock	:	JavaScript, A Beginner's Guide
6	Janine C. Warner	:	Dreamweaver CS5 For Dummies Paperback Edition
7	Joseph Lowery	:	Adobe Dreamweaver CS5 Bible Paperback Edition
8	David Powers	:	The Essential Guide to Dreamweaver CS4

Object Oriented Programming using C++
BCA-16-204

L	T	P	Cr	External Marks: 65
6	-	-	3	Internal Marks: 10

Time Duration: 3 Hrs. Number of Lectures : 60

Objectives: By the end of the course, students will be able to write C++ programs using the more esoteric language features, utilize Object Oriented techniques to design C++ programs, use the standard C++ library, and exploit advanced C++ techniques.

Note :

i. The Question Paper will consist of Four Sections.
ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
iv. All questions carry equal marks unless specified.

SECTION-A

Principles of Object Oriented Programming(OOP); Introduction to OOP, Difference between OOP and Procedure Oriented Programming; Concepts: Object, Class, Encapsulation, Abstraction, Polymorphism and
Inheritance, Applications of OOP. Special operators: scope resolution operator, Member Dereferencing operators, Memory management operators, Manipulators and Type cast operator
Structure of a C++ Program and Classes and Objects : Class Declaration : Data Members, Member Functions, Private and Public members, Creating Objects, Accessing class data members, Accessing member functions; Class Function Definition: Member Function definition inside the class declaration and outside the class declaration.

SECTION-B

Friend function, inline function, Static members, Function Overloading, Arrays within a class. Arrays of Objects; Objects as function arguments: Pass by value, Pass by reference, Pointers to Objects.
Constructors: Declaration and Definition, Types of Constructors, (Default, Parameterized, Copy Constructors). Destructors: Definition and use.
Operator Overloading & Type Conversion: Conversion from basic type to user defined type, User defined to basic type and one user defined conversion to another user defined type.

SECTION-C

Inheritance: Extending Classes Concept of inheritance, Base class, Defining derived classes, Visibility modes : Public, Private, Protected ;Types of Inheritance: Single inheritance :

Privately derived, Publicly derived; Making a protected member inheritable, multilevel inheritance, multiple Inheritance and ambiguity of multiple inheritance, Hierarchal Inheritance, Hybrid, Nesting of classes.

Polymorphism: Definition, Application and demonstration of Data Abstraction, Encapsulation and Polymorphism. Early Binding, Polymorphism with pointers, Virtual Functions, Late binding, pure virtual functions.

SECTION-D

Exception Handling: Definition, Exception Handling Mechanism : Throwing mechanism and Catching Mechanism, Rethrowing an Exception

File Processing : Opening and closing of file, Binary file operations, structures and file operations, classes and file operations, Random file processing.

References :

1. Bjarne Stroustrup, 2009 : The C++ Programming Language, Addison-Wesley Publishing Company.
2. E. Balaguruswamy, 2008 : Object Oriented Programming with C++, TMH.
3. Robert Lafore, 2003 : Object Oriented Programming in Turbo C++, Galgotia Pub.
4. Salaria, R. S. : Object Oriented Programming Using C++, Khanna Book Publishing Co. (P.) Ltd., New Delhi.

THIRD SEMESTER

Third Semester						
Sr. No.	**Subject**	**LT/ Week**	**Theory Marks**	**Internal Assessment**	**Exam. Hours**	**Paper Code**
10.	Computer Based Numerical Methods	6	90	10	3	BCA-301
11.	Data Structures	6	90	10	3	BCA-302
12.	Implementation of Object Oriented concept through C++	6	90	10	3	BCA-303
13.	Computer Lab.: Based on BCA – 301, BCA – 302 and BCA – 303	12	45	05	4	BCA-304

Fourth Semester						
14.	Project Management & System Development	6	90	10	3	BCA-401
15.	Client Server Computing using ORACLE	6	90	10	3	BCA-402
16.	Understanding UNIX	6	90	10	3	BCA-403
17.	Computer Lab.: Based on BCA-402 and BCA-403	6	45	05	4	BCA-404

Paper Code : BCA - 301
Paper Title : Computer Based Numerical & Statistical Methods
Theory Marks : 90 **Number of Lectures: 60**
(45 minutes duration)

Objective : Discuss the basic techniques in Numerical & Statistical Methods

Note :	(i)	The syllabus of this paper has been divided into four sections.
	(ii)	Examiner will set total n i n e questions comprising two questions from each Section and one compulsory question of short answer type covering
	(iii)	The students are required to attempt one question from each Section and the entire Compulsory question.
	(iv)	All questions carry equal marks, unless specified.
	(v)	**The student can use only Non-programmable & Non-storage type**
	(vi)	**Note : Log table may be provided**

SECTION-A

1. Computer Arithmetic :
Floating Point Numbers, operations, normalizations and their consequences, Errors and its types.

2. Iterative Methods :
Bisection, False-Position, Newton - Raphson Methods, Zeros of a polynomial using Birge – Vieta Method.

(No. of Periods : 15)

SECTION-B

3. Simultaneous Linear Equations : Solution of Simultaneous Linear Equations Using Gauss - Elimination, Gauss-Jordan and Gauss-Seidal Methods, Concept of Pivoting.

4 Interpolation: Lagrange, Newton forward, Newton Backward, Divided Difference,
Newton forward difference, Newton Backward difference, Numerical Integration: Trapezoidal, Simpson's 1/3, Simpson's 3/8, Weddle and Runga–Kutta Methods: 2nd order & 4th order.

(No. of Periods : 15)

SECTION-C

5. Measures of Central Tendency:
Preparing Frequency distribution table, Arithmetic mean, Geometric mean, Harmonic mean, Median and Mode.

6. Measures of Dispersion, Skewness and Kurtosis, Range :
Mean deviation, Standard deviation, Coefficient of variation, Moments, Skewness and Kurtosis. Development of Programs for above Statistical Methods using C

(No. of Periods : 15)

SECTION-D

7. Correlation and Regression Analysis :
Least square fit; Polynomial and curve fittings; Linear regression and non linear regression algorithms.

8. Development of Programs for above Statistical Methods using C.

(No. of Periods : 15)

References :

1. Salaria, R.S. : Computer Oriented Numerical Methods, 5th Edition, Khanna Book Publishing Co. (P.) Ltd., New Delhi
2. Rajaraman, V., 2004 : Computer Programming in C, Prentice Hall of India.
3. Krishnanmurthy,E.V.& Sen, S. K., 1984 : Computer Based Numerical Algorithms, East West Press.
4. Rajaraman, V., 1980 : Computer Oriented Numerical Methods, 3rd Ed., Prentice Hall, India.
5. Balaguruswami, E., 2000 : Computer Oriented Statistical and Numerical Methods, Mac Million.
6. Gupta, M. K., Goon, A.M., Dasgupta, B., 1978 : Fundamentals of Statistics, Pub. Calcutta, World Press Kolkatta
7. Affi, A.A, 1979 : Statistical Analysis : A Computer Oriented Approach, Academic Press, Inc.
8. Salaria, R.S. : Simplified Text-cum-Workbook on Computer Oriented Numerical Methods : A Programming Approach, Khanna.
9. Gupta, S.P., 2003 : Statistical Methods, S. Chand.

Paper Code : BCA-302
Paper Title : Data Structures
Theory Marks : 90 **Number of Lectures : 60**
(45 minutes duration)

Objectives: The basic algorithms related to handling data like arrays, stack, lists, queue, trees and graphs are introduced in this subject. The implementation of these algorithms will be done using previously learned C programming language.

Note : (i) The syllabus of this paper has been divided into four sections.

(ii) Examiner will set total nine questions comprising two questions from each Section and one compulsory question of short answer type covering whole syllabi.

(iii) The students are required to attempt one question from each Section and the entire Compulsory question.

(iv) All questions carry equal marks, unless specified.

(v) **The student can use only Non-programmable & Non-storage type**

SECTION-A

1. Basic Concepts and Notations, Introduction to Complexity, Data Structure and Data Structure operations. Applications of Data Structure. Basic data Structures: Arrays: Introduction, Types of Array, Memory representation, Applications and operations. Stacks and queue: Introduction, memory representation, Applications and operations

(No. of Periods : 15)

SECTION-B

2. Linked List: operations:-traversing, searching, inserting, deleting, operations on header linked list, circular linked list, doubly linked list, memory representation, Applications, polynomial manipulation.

(No. of Periods : 15)

SECTION-C

3. Trees – Definition and Basic concepts, Representation in Contiguous Storage, Binary Tree, Binary Tree Traversal, Searching, Insertion and deletion in Binary trees, Binary Search tree, AVL trees.

(No. of Periods : 15)

SECTION-D

4. Searching: Binary and Linear Search. Sorting: Bubble sort, Insertion sort, Selection sort, Merge Sort, Radix sort, Quick sort, Shell sort, Heap Sort. Comparison of various Searching and Sorting algorithms.

(No. of Periods : 15)

References :

1. Lipschuitz L. Seymour, 2001 : Data Structure, Schaum Outline Series, TMH, New Delhi.
2. Tannenbaum, Aaro M., 1990 . : Data Structure Using C, Pearson.
3. Salaria, R. S. : Data Structures & Algorithm Using C, Khanna Book Publishing
4. Salaria, R. S. : Co. (P.) Ltd., New Delhi.
   Test Your Skills in Data Structures, Khanna Book Publishing Co.

   (P.) Ltd., New Delhi.
5. Sofat Sanjeev : Data Structure with C and C++, Khanna Book Publishing Co.
6. Patel, R.B. : Expert Data Structure in C, Khanna Book Publishing Co.

Paper Code : BCA-303
Paper Title : Implementation of Object Oriented Concept through C++

Theory Marks : 90 **Number of Lectures : 60 (45 minutes duration)**

Objectives: By the end of the course, students will be able to write C++ programs using the more esoteric language features, utilize Object Oriented techniques to design C++ programs, use the standard C++ library, exploit advanced C++ techniques

Note : (i) The syllabus of this paper has been divided into four sections.

(ii) Examiner will set total nine questions comprising two questions from each Section and one compulsory question of short answer type covering whole syllabi.

(iii) The students are required to attempt one question from each Section and the entire Compulsory question.

(iv) All questions carry equal marks, unless specified.

(v) **The student can use only Non-programmable & Non-storage type**

SECTION-A

1. Concepts of Object Oriented Programming (OOP): Introduction to OOP, Difference between OOP and Procedure Oriented Programming, Object, Class, Encapsulation, Abstraction, Polymorphism, Inheritance.

   Structure of a C++ Program and I/O streams. Classes and Objects, Class Declaration : Data Members, Member Functions, Private and Public members, Creating Objects, Accessing class data members, Accessing member functions Class Function Definition: Member Function definition inside the class declaration and outside the class declaration, friend function, inline function, static function.

   (No. of Periods : 15)

SECTION-B

2. Scope resolution operator, Private and Public member function, Nesting of member functions, Arrays within a class. Arrays of Objects, Objects as function arguments : Pass by value, Pass by reference, Pointers to Objects. Constructors and Destructors : Declaration and Definition, Types of Constructors, (Default, Parameterized, Copy Constructors). Destructors: Definition and use. Function Overloading & Operator Overloading

   (No. of Periods : 15)

SECTION-C

3. Inheritance - Concept of inheritance, Base class, Defining derived classes, Visiblity modes :Public, Private, Protected ; Single inheritance : Privately derived, Publicly derived; Making a protected member inheritable, Access Control to private and protected members by member functions of a derived class, Multilevel inheritance, Nesting of classes.

4. Polymorphism : Definition, Application and demonstration of Data Abstraction, Encapsulation nd Polymorphism. Early Binding, Polymorphism with pointers, Virtual Functions, Late binding, pure virtual-functions

(No. of Periods : 15)

SECTION - D

5. Templates: Function Template, class template
   Exception Handling|: using try, throw and catch statements
6. File Processing : Opening and closing of file, Binary file operations, structures and file operations, classes and file operations, Random file processing.

(No. of Periods : 15)

References :

1.	Bjarna Stroustrup,	:	The C++ Programming Language, 3rd Edition, Company.
2.	Robert Lafore,	:	Object Oriented Programming in Turbo C++,4un Edition, Galgotia Pub.
3.	E. Balaguruswamy,	:	Object Oriented Programming with C++, 4th Edition,TMH.
4.	Salaria, R. S.	:	Object Oriented Programming Using C++,4th Edition, Khanna Book Publishing Co. (P.) Ltd., New Delhi.

Paper Code : BCA-304

Paper Title : Computer Lab.-1: Based on BCA-301 ,BCA-302 and BCA-303

Marks : 50

FOURTH SEMESTER

aper Code : BCA -401
Paper Title : Project Management and System Development
Theory Marks : 90 **Number of Lectures: 60**
(45 minutes duration)

Objectives: To explain the need for project management, role of project managers in organizational environments. Further the course aims to describe the systems development cycle.

Note : (i) The syllabus of this paper has been divided into four sections.

(ii) Examiner will set total nine questions comprising two questions from each Section and one compulsory question of short answer type covering whole syllabi.

(iii) The students are required to attempt one question from each Section and the entire Compulsory question.

(iv) All questions carry equal marks, unless specified.

(v) **The student can use only Non-programmable & Non-storage type**

SECTION-A

1. Concept of a Project, Project Life Cycle Phases, Tools & Techniques of Project Management, Roles & Responsibilities of a Project Manager, Feasibility Report, Types of Feasibility, Financing Arrangements, Preparation of Cost Estimates, Project Implementation Schedule, Evaluation of Project Profitability.

(Total No. of Periods – 15)

SECTION-B

2. Working & Design of Systems, System Design & Execution Plan, Work Breakdown Structure, Project Procedure Manual, Planning, Scheduling & Monitoring, Project Direction & Co- ordination, Communications in a Project, Project Control-Progress, Performance, Schedule & Cost Control, Performance Indicators & Performance Improvement, Project Management Environment.

(Total No. of Periods – 15)

SECTION-C

3. Introduction & Objectives of Software Specification & Requirement Analysis (SRS), Software Specification Documents & Attributes, Software Development Life Cycle, Data Dictionary, Decision Support Tools, Data Flow Diagrams, Mathematical Logic.

(Total No. of Periods – 15)

SECTION – D

4. Report Writing: Characteristics, Types, Structure, Importance & Style of Reports, Case Studies- Designing Illustrative Reports.

Project Management Software Tools : Features, Different components of both licensed and Open Source Software.

(Total No. of Periods – 15)

References :

1.Choudhary, S., 1988 : Project Management, Tata McGraw-Hill Publishing Company Limited, 1988 (Recommended as a text-book for the syllabus contents-6).

2. Sharma, R.C., and Krishna Mohan, 1996 : Business Correspondence and Report Writing, Second Edition, Tata McGraw-Hill Publishing Company Ltd., 1978, Reprinted in 1996 (Pages 129-230).

3. Gopalakrishnan, P. & Rama Moorthy, V.E., 1993. : Text Book of Project Management, Mac Million India Ltd.

4. Harrison, F.L., 1992. : Advanced Project Management, A Structured Approach (Third Edition), Metropolitan

.

5. Srinath, I. S., 1989. : PERT & CPM, Principles and Applications, Third Edition, Affiliated East-West Press Pvt. Ltd.

6. Rodrigues, M.V., 1992 : Effective Business Communication, Concept Publishing Company, 1992 (Pages 411-436).

7. Krishna Mohan & Banerji Meera, 1990. : Develop Communication Skills, MacMillian India Ltd.

8. Behforooz, Ali and Hudson Frederick,1996. : Software Engineering Fundamentals, Oxford University Press.

9. Kanter, J.,1984 : Management Information Systems, PHI.

10. Gill, Nasib Singh : Software Engineering, Khanna.

11. Rajib Mall, 2004 : Fundamentals of Software Engineering, PHI.

12. Pressman, Roger S., 2010 : Software Engineering, Tata McGraw Hill.

13. Jagdeep Singh : System Analysis and Design, Kalyani.
14. Awad, Elias M., 1993 : System Analysis and Design, Galgotia.
15. Kaur, Kirandeep : Project Management and Technical Report Writing, Kalyani

Paper Code **BCA – 402**

Paper Title **:** Client Server Computing using ORACLE

Theory Marks **:** **90** **Number of Lectures : 60**
(45 minutes duration)

Objectives: This course aims at giving the students the insight of Client Server Computing and Creating Applications using Oracle.

Note : (i) The syllabus of this paper has been divided into four sections.

(ii) Examiner will set total nine questions comprising two questions from each Section and one compulsory question of short answer type covering whole syllabi.

(iii) The students are required to attempt one question from each Section and the entire Compulsory question.

(iv) All questions carry equal marks, unless specified.

(v) **The student can use only Non-programmable & Non-storage type Calculator.**

SECTION-A

1. Introduction to DBMS, Advantages and disadvantages of DBMS, introduction to RDBMS, Codd's Rule for RDBMS, Difference between DBMS and RDBMS. Normalization. Data Models and their types (Hierarchical, Networking, Relational).

Introduction to Client-Server Computing, Architecture of Client-Server Computing, Advantages of Client-Server Computing.

Introduction to SQL *Plus : Introduction to SQL, Oracle Data types, Starting SQL *Plus, Data Manipulation and Control-I : Data Definition Language (DDL), Creating Tables, Creating a Table with data from another table, Inserting Values into a Table, Updating Column(s) of a Table, Deleting Row(s) from a Table, Dropping a Column, Querying database tables, Conditional retrieval of rows, Working with Null Values, Matching a pattern from a table, Ordering the Result of a Query, Aggregate Functions, Grouping the Result of a Query, ROLLUP Operation: Getting Sub Totals, CUBE Operation : Getting Cross Tabs, Command Summary of SQL *Plus Editor.

(No. of Periods : 15)

SECTION-B

2. Functions : Arithmetic Functions, Character Functions, Date Functions, General Functions; Group Functions. Introduction to VIEWs, Manipulating the Base table(s) through VIEWs, Rules of DML Statements on Join Views, Dropping a VIEW, Inline Views, Materialized Views. Querying Multiple Tables : Collating Information: Equi Joins, Cartesian Joins, Outer Joins, Self Joins. ;Set Operator : Union, Intersect, Minus; Nested Queries. Data Manipulation and Control-II : Database Security and Privileges, GRANT Command, REVOKE Command, Application Privileges Management, Enhancing Performance, Sequences,

Maintaining Database Objects, COMMIT and ROLLBACK.

(No. of Periods : 15)

SECTION-C

3. PL/SQL-I : Introduction to PL/SQL, The Advantage of PL/SQL, PL/SQL Block Structure, PL/SQL Architecture, Fundamentals of PL/SQL, PL/SQL Data Types, Variables and Constants, Scope and Visibility of a Variable, Assignments and Expressions, Operator Precedence, Referencing Non- PL/SQL Variables, Built-in-Functions, Conditional and Iterative Control, SQL Within PL/SQL, Writing PL/SQL Code, Composite Datatypes.

(No. of Periods : 15)

SECTION-D

4. PL/SQL-II: Cursor Management in PL/SQL, Cursor Manipulation, Implicit Cursor Attributes, Exception Handling in PL/SQL; Predefined Exceptions, User Defined Exceptions.

   Advanced PL/SQL: Subprograms in PL/SQL, Advantages of Subprograms, Procedure, Functions, Actual versus Formal Parameters, Argument Modes, Stored Packages, Advantages of Packages, Dropping a Procedure, Dropping a Function, Dropping a Package, Using Stored Function in SQL Statements, Database Trigger, Types of Triggers, Dropping Triggers, Storage for Triggers.

(No. of Periods : 15)

References :

1. James T. Perry, Joseph, G. Lateer, 1989 : Understanding ORACLE, BPB Publications, B-14, Connaught Place, New Delhi - 110001.

2. Mukhi Vijay, 1992 : Mastering Oracle 6.0, BPB Publications.

Paper Code : BCA – 403
Paper Title : Understanding UNIX
Theory Marks : 90 **Number of Lectures : 60**
(45 minutes duration)

Objective: To introduce UNIX environment, edit and manage files and user-level security for UNIX development, Use standard UNIX development tools for C or C++.

Note : (i) The syllabus of this paper has been divided into four sections.

(ii) Examiner will set total nine questions comprising two questions from each Section and one compulsory question of short answer type covering whole syllabi.

(iii) The students are required to attempt one question from each Section and the entire Compulsory question.

(iv) All questions carry equal marks, unless specified.

(v) **The student can use only Non-programmable & Non-storage type Calculator.**

SECTION-A

1. Introduction to Operating Systems, its needs and services, Simple batch Systems, Multi- programmed batched systems, Time sharing systems, Parallel systems, Distributed systems and Real-time systems. Introduction to process, Process States . Overview of UNIX : History, Features of UNIX, Comparison between UNIX and Windows.
Structure of UNIX: Kernel, Shell. UNIX Directory system

(No. of Periods : 15)

SECTION-B

2. UNIX Commands : User Access and User ID Commands, Directory commands, Editors Commands, File Manipulation Commands, Security and Protection Commands, Inter-User and Inter-Machine Communication, Process Management Commands, I/O Redirection and Piping Commands, Vi editor, File Handling commands, and Introduction to Regular Expressions and grep.

(No. of Periods : 15)

SECTION-C

3. Administering UNIX System: Introduction to System Administration, Functional activities of System Administration - Starting up the system, Maintaining the Super User Login, Shutting down the system, recovering from system crash, Taking backups, Managing disk space, Mounting and Un-mounting file system, Adding and removing users, Changing groups and password, Maintaining security, Monitoring system activity, Accounting of system usage and billing, Setting up remote communication, Installing printers and peripheral devices.

(No. of Periods : 15)

SECTION - D

4. Shell Programming : Executing a shell program, Study of shell programming as a Language; Wild card characters, Type of statements and Reserved Words, Special Shell parameters. The AWK pattern scanning and processing language: Operators, Control Statements and arrays. String Handling programs (String comparison, substring,string splitting) using AWK:UNIX and Networking : Network Troubleshooting(Commands-ping, ipconfig, nslookup, traceroot).Introduction to IP addresses and classes.

(No. of Periods : 15)

References :

1. Srirengan, K., 1999. : Understanding UNIX, Prentice-Hall of India.

2. Kernighan, B.W. & : The UNIX Programming Environment, Prentice-Hall of India Rob Pike, 1997

Paper Code : BCA-404

Paper Title : Computer Lab.-2: Based on BCA - 402 and BCA - 403

Marks : 50

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FIFTH SEMESTER

Fifth Semester

Sr. No.	Subject	LT/ Week	Theory Marks	Internal Assessment	Exam. Hours	Paper Code
18.	Enterpreneurship Development Programme	4	90	10	3	BCA-501
19.	Principal of Computer Graphics & Multimedia Technology	5	90	10	3	BCA-502
20.	Discrete Mathematics in Computer Science	5	90	10	3	BCA-503
21.	Computer Lab.: Based on BCA-502	5	90	10	4	BCA-504

Sixth Semester

22.	Web Programming	5	90	10	3	BCA-601
23.	Computer Organization	5	90	10	3	BCA-602
24	Computer Networks	5	90	10	3	BCA-603
24.	Minor Project and Seminar Based on BCA-601	5	90	10	4	BCA-604

SYLLABI FOR
BACHELOR OF COMPUTER APPLICATIONS

Paper Code : BCA – 501
Paper Title : Enterpreneurship Development Programme
Theory Marks : 90 Number of Lectures : 100
(45 minutes duration)

Objectives : EDP aims at training various target groups in entrepreneurial traits so that they obtain adequate information, motivation and guidance in setting up their own enterprises.

Note : (i) The syllabus of this paper has been divided into four sections.

(ii) Examiner will set total n i n e questions comprising two questions from each Section and one compulsory question of short answer type covering

(iii) The students are required to attempt one question from each Section and the entire Compulsory question.

(iv) All questions carry equal marks, unless specified.

(v) **The student can use only Non-programmable & Non-storage type Calculator.**

SECTION-A

1. Project Formulation : Need, Scope and approaches for project formulation; structure of project report; study and analysis of sample project report; preparation of a project report; Techno- economic feasibility of the project.

(No. of Periods : 25)

SECTION-B

2. Finance & Accounting : Working capital assessment, its management & exercise thereon; Assessment of fixed capital and exercise thereon; Capital budgeting; Product costing and cost consciousness. Financial ratios and their significance; Break-even analysis; Credit institutions and financing procedures; Books of accounts, financial statements & fund flow analysis.

(No. of Periods : 25)

SECTION-C

3. Managing the Enterprise: Resource management – men, material, money and machines; Personnel management, Office management.

E-Commerce: Introduction to E-Commerce, Benefits, Impact of E-Commerce, Classification of E- Commerce, Application of E-Commerce.

(No. of Periods : 25)

SECTION - D

4. Rules & Regulations: Licensing and Registration procedure; Appreciation of important provisions of Factory Act, Shops & Commercial Establishment Act; Sales of Goods Act, Partnership Act; Contract Act; Income Tax, Sales Tax and Excise rules; Insurance.

(No. of Periods : 25)

References :

1	Sinha, A.K, 1983.	:	Project Engineering & Management, Vikas Publishing House Pvt. Ltd., 1983.
2.	Srivastava, U. K., 1981	:	Project Planning, Financing, Implementation & Evaluation, Indian Institute of Management, Ahmedabad,1981.
3.	Kuchhal, S. C., 1982	:	Financial Management - An Analytical and Conceptual Approach, Chaitanya Pub. House, 1982.
4.	Mohan, 1982	:	Principles of Management Accounting, Mohan & Goyal, Agra Sahitya Bhavan,1982.
5.	Saroja, 1979	:	Management of Small Scale Industries, SethPublishers, Bombay, 1979.
6.	Vepa Ram K., 1984	:	How to Succeed in Small Industry, Vikas Publishing House, New Delhi, 1984.
7.	Bare Acts	:	Central Sales Tax Act, State Sales Tax Act, Central Excise Act and Customs Act.
8.	Bhagwati Prasad, 1972	:	Law and Practice of Income Tax in India, Navman Prakashan.
9.	Gulshan, S. S., 1979	:	A Text Book of Commercial Law, S. Chand & Co.
10.	Gupta, B. P., 1986	:	Industrial Relations, (PHD Chamber of Commerce & Inds.).

Paper Code : BCA - 502
Paper Title : Principles of Computer Graphics & Multimedia Technology
Theory Marks : 90

Number of Lectures :100
1 (45 minutes duration)

Objectives :

- To study the various graphical techniques
- To study the multimedia concepts and various I/O technologies.
- To enable the students to develop creative graphics based programs.

Note : (i) The syllabus of this paper has been divided into four sections.

(ii) Examiner will set total nine questions comprising two questions from each Section and one compulsory question of short answer type covering whole syllabus.

(iii) The students are required to attempt one question from each Section and the entire Compulsory question.

(iv) All questions carry equal marks, unless specified.

(v) **The student can use only Non-programmable & Non-storage type Calculator.**

SECTION-A

Computer Graphics :

1. A Survey of Computer Graphics :
   Computer Aided Design, Presentation Graphics, Computer art, Entertainment, Education and Training, Visualization, Image Pressing, Graphical User Interfaces.
   (No. of Periods : 15)
2. Overview of Graphics Systems :
   Video Display Devices, Raster Scan Systems, Random Scan Systems. Coloring technique : Beam Penetration, Shadow Mask. Graphics Monitors:Plasma Panel, LED,LCD. Properties of Display Devices :
   Persistence , Resolution, Aspect Ratio. and Workstations, Input Devices, Hard-copy devices, Graphics Software. Interactive Graphics, Passive Graphics.
   (No. of Periods : 10)

SECTION-B

3. Studying the Features and Developing Computer Graphics Using Standard Graphics packages like Auto CAD and Photoscape.
   AutoCAD: Features, Workspace, Commands to draw line, Polyline, rectangle, polygon, circle, spline, hatch; Modification Commands: Erase, copy, move, mirror, scale, Pan, Zoom, esc, cl, trim; Layer, Dimension, image rotation, area calculation.
   (No. of Periods : 10)
4. Developing Computer Graphics Using 'C' : Input-output primitives, Setting character and text attributes, Changing line styles, Using fill styles to fill images.

   Use the above primitives to develop programs like drawing concentric circles, Ellipses, Sine surves, Histograms, Pie charts and human face.

(No. of Periods : 15)

SECTION-C

Multimedia Technology :

5. Multimedia in use : Introducing multimedia, uses of multimedia.

6. Technology System Components, Multimedia Platforms, Development Tools, Image, Audio, Video, Storage for multimedia and Communications.

7. Applications :
Multimedia in the Real World, Training and Education, Image Processing.

(No. of Periods : 25)

SECTION-D

8. IMAGE : Introduction, Digital Image, Image Redundancies (Spatial, Spectral, Temporal); Image Compression: lossy and lossless compression Techniques, Run Length Encoding algorithm, Huffman Encoding Algorithm, Discrete Cosine Transform (DCT), Image, video and audio Formats.

9. Studying features and use of Multimedia Image Processing authoring tools like Photoshop and Macromedia Director.

(No. of Periods : 25)

References :

1. Hearn and Backes, 1997 : Computer Graphics, Second Edition, PHI, New Delhi.
2. Kanetkar Yashwant, 2003 : Graphics Under 'C', BPB Publications.
3. Judith Jeffcoate, 2007 : Multimedia in Practice, Technology and Applications, PHI.
4. Foley, Vandom, Fenier, Hughes, 1996 : Computer Graphics, Principles and Practice, IV Edition in 'C'; Addison Wesley Publishers.
5. Ian R. Sinclair, 1994 : Multimedia on the PC (with CDROM), BPB Publications.
6. Hillman, David, 1998 : Multimedia Technology and Applications, ITP.
7. Vaughan, Tay, 2008 : Multimedia Making it Work, Osborne Publishers.
8. Kelly & Bootle, 1989 : Turbo 'C', BPB Publications.

Paper Code : BCA – 503
Paper Title : Discrete Mathematics in Computer Science
Theory Marks : 90 Number of Lectures : 100 (45 minutes duration)

Objectives : Student will learn and revise the knowledge acquired previously. Logic, Relations and Functions, Algebric Functions and Graph Theory will be introduced in this course.

Note : (i) The syllabus of this paper has been divided into four sections.

(ii) Examiner will set total nine questions comprising two questions from each Section and one compulsory question of short answer type covering whole syllabus.

(iii) The students are required to attempt one question from each Section and the entire Compulsory question.

(iv) All questions carry equal marks, unless specified.

(v) **The student can use only Non-programmable & Non-storage type Calculator.**

SECTION-A

1. Set Theory : Relations and Functions : Set Notation and Description, subset, basic set operations, Venn Diagrams, laws of set theory, partitions of sets, min sets, duality principle, basic definitions of relations and functions, graphics of relations, properties of relations: injective, surjective and bijective functions, compositions.

2. Recurrence : Recurrence Relations and Recursive Algorithms – Linear-Recurrence Relations with Constant Coefficients; Homogeneous Solutions : Particular Solution, Total Solution, Solution by the Method of Generating functions.

(No. of Periods : 25)

SECTION - B

3. Graph Theory : Graph and planar graphs – Basic Terminology, Multi-graphs, Weighted Graphs, Paths and Circuits, Shortest Paths, Eulerian Paths and Circuits. Travelling Salesman Problem, Planar Graphs.

(No. of Periods : 25)

SECTION-C

4. Automata Theory : Finite State Machines–Equivalent Machines, Finite State Machines as language Recognizers; Analysis of Algorithms-Time Complexity,Complexity of Problems.
5. Boolean Algebra : Lattices and Algebraic Structures; Duality. Distributive and Complemented Lattices, Boolean Lattices and Boolean Algebra.

(No. of Periods : 25)

SECTION-D

6. Boolean Functions and Expressions, Propositional Calculus, Design and Implementation of Digital Networks, Switching Circuits.

(No. of Periods : 10)

7. Algebra of Logic : Proposition of logic operations, truth tables and propositions generated by set, equivalence and implication laws of logic, mathematical system, propositions over a universe, mathematical induction, quantifiers.

(No. of Periods : 15)

References :

1. Doerr, A. and Kenneth, L., : Applied Discrete Structures for Computer Science, 1989 Galgotia Publications Pvt. Ltd.
2. Liu, C. L., 1985 : Elements of Discrete Mathematics, McGraw Hill.
3. Seymour Lipschutz and Lipson, : 2000 Solved Problems in Discrete Mathematics, McGraw-Hill.1992

Paper Code	:	BCA - 504
Paper Title	:	Computer Lab.-1 : Based on BCA - 502
Theory Marks	:	90

SIXTH SEMESTER

Paper Code : BCA - 601
Paper Title : Web Programming
Theory Marks : 90

Number of Lectures : 100
(45 minutes duration)

Objectives : This course will help the student to design & develop websites using HTML, Javascript and JAVA programming languages

Note : (i) The syllabus of this paper has been divided into four sections.

(ii) Examiner will set total nine questions comprising two questions from each Section and one compulsory question of short answer type covering whole syllabus.

(iii) The students are required to attempt one question from each Section and the entire Compulsory question.

(iv) All questions carry equal marks, unless specified.

(v) **The student can use only Non-programmable & Non-storage type**

SECTION-A

1. Review of forms in HTML, *Introduction to cascading style sheets (CSS), defining and applying CSS.*
Java Script: Features, tokens, data types, variables, operations, control structs, likes, strings arrays, functions, core language, objects, client side objects, event handling. Applications related to client side form validation.

(No. of Periods : 25)

SECTION-B

2. Fundamentals of Java: Java Vs. C++, Byte Code, Java virtual machine, constants, variables, data types, operators, expressions, control structures, defining class, creating objects, accessing class members, constructions, method overloading. *String handling.*
Inheritance : Basics, member access, using super to call super class constructors, creating a multi level hierarchy, method overriding, dynamic method dispatch, using abstract classes, using Final.

(No. of Periods : 25)

SECTION-C

3. Packages and Interfaces: Defining a package, understanding CLASSPATH, Access protection: Importing packages, Interfaces, Defining an Interface, Implementing Interfaces, Applying Interfaces, Variables in Interfaces.

Exception Handling: Fundamentals, Exception types, Using Try and Catch, Multiple Try and Catch clauses, Nested Try statements, Built–in exceptions.

(No. of Periods : 25)

SECTION-D

4. Multi-threaded Programming: The Java Thread model, Thread priorities, Synchronizations, Messaging. The thread class and runnable interface, The Main Thread : Creating a Thread, Implementing Runnable, Extending Thread, Creating Multiple Threads, Thread Priorities; Synchronizations : Methods, Statements, Inter Thread Communication, Deadlock, Suspending, Resuming and Stopping Threads.

   I/O Applets : I/O Basics : Streams, The predefined streams; Reading console I/P, Writing console O/P. The print writer class; Reading and Writing files.
   Applet fundamentals, Using AWT controls: AWT Classes, Adding and Removing Controls,Responding to Controls, Controls and their classes, Graphics and Text , Layout Managers: Understanding Layout Manager, FlowLayout, BorderLayout, GridLayout, CardLayout. Menus,-Event handling: Two Event Handling Mechanisms, Delegation Event Model (Events, Event Sources, Event Classes, Event Listeners, Sorces of Events, Event Listener Interfaces, Handling Mouse and Keyboard Events.

(No. of Periods : 25)

References :

1. Schildt Herbert : Java 2: The Complete Reference,4th Edition,TMH, N.Delhi.
2. Daniel Dang, 2010 : An Introduction to Java Programming, PHI, New Delhi.
3. Balaguruswamy, E., 1998 : Programming with Java, A Primer, TMH, New Delhi.
4. Wanger & Wyke, 2000 : Java Script Unleased, Techmedia, New Delhi, 2000.

Paper Code : BCA - 602
Paper Title : Computer Organisation
Theory Marks : 90 **Number of Lectures : 100**
(45 minutes duration)

Objectives : This course will enable the student to understand the basic organization of computer system and system maintenance.

Note : (i) The syllabus of this paper has been divided into four sections.

(ii) Examiner will set total nine questions comprising two questions from each Section and one compulsory question of short answer type covering whole syllabus.

(iii) The students are required to attempt one question from each Section and the entire Compulsory question.

(iv) All questions carry equal marks, unless specified.

(v) **The student can use only Non-programmable & Non-storage type Calculator.**

SECTION-A

1. **Computer Organisation** : Evolution of Computers, Stored program concept and Von Neumann Architecture, Information representation and codes, Combinatorial Blocks : Gates, Multiplexers, Decoders, Encoders, Sequential Building blocks : Flip Flops, Registers, Counters, Arithmetic algorithms : Addition and substraction for signed magnitude and 2's complement numbers, integer multiplication using shift and add, Booth's algorithms, Integer and floating point representation.

(No. of Periods : 25)

SECTION-B

2. **Architecture of a Simple Processor** : An instruction set, Addressing Modes, Instruction formats, Instruction execution in terms of Microinstructions, Concept of interrupt and simple I/O organisation, I/O organization : Strobe based and Handshake based communication, Vector and priority interrupts, DMA based data transfer; CPU organisation with large registers, Stacks and handling of interrupts and subroutines. Concept of Bus, data movement among registers, data movement from/to memory.

(No. of Periods : 25)

SECTION-C

3. **Memory Organisation** : RAM, Basic cell of static and dynamic RAM, Building large memories using chips, Associative memory, Cache memory organisation, Virtual memory organisation. Assembly Language Programming : Machine and assembly language, Pseudo operations, subroutines in assembly language, Assembly language programs:-To add/subtract two numbers, Program to input/output one character, Program to demonstrate the use of subroutines. Register Transfer Language and micro-operations; Language to represent conditional data transfer, Arithmetic and logical operations along with register transfer.

(No. of Periods : 25)

SECTION-D

4. **System Maintenance,** Physical Inspection of a PC and internal cards, Diagnostics on a PC, Functional description of various modules and cards. *PC Doctor, Norton, Simantac,Steps of Diagnostics*. Viruses, Types of viruses. *Detection, Protection and Cure of Viruses on a PC*.

(No. of Periods : 25)

References :

1. M. Morris Mano, 1993. : Computer System Architecture, Prentice Hall International, 3rd Ed.,
2. P. Pal Choudhri, 1994. Computer Organisation and Design, Prentice Hall of India.
3. Biswal, Sadasiva, 2001 Basic Electronics, Pub-Atlantic, New Delhi.
4. B. Govindarajalu, 1994. : IBM-PC and Clones - Hardware Troubleshooting and Maintenance, Tata-McGraw-Hill.
5. Rao, P.V.S. 2008 : Computer System Architecture, PHI, 1ST Edition

Paper Code : BCA - 603
Paper Title : Computer Networks
Theory Marks : 90 **Number of Lectures : 60**
(45 minutes duration)

Objectives : As part of this course, students will be introduced to computer networks and data communication paradigms, network models and standards, network protocols and their use and wireless technologies.

Note : (i) The syllabus of this paper has been divided into four sections.

(ii) Examiner will set total nine questions comprising two questions from each Section and one compulsory question of short answer type covering whole syllabus.

(iii) The students are required to attempt one question from each Section and the entire Compulsory question.

(iv) All questions carry equal marks, unless specified.

(v) **The student can use only Non-programmable & Non-storage type Calculator.**

SECTION-A

1. Introduction to Data Communication: Data Communication fundamentals, Simplex, Half-Duplex, Full-Duplex
Network definition, Network Hardware and Software, Network Topologies, Uses of Computer Networks, OSI reference model, TCP/IP Reference Model. Comparison of OSI & TCP/IP reference model.

2. Physical Layer: Transmission Media, Switching, ISDN & its services, Multiplexing, Modems.

(No. of Periods: 15)

SECTION-B

3. Data Link Layer : Design Issue, Error Detection & Correction Codes, Elementary Data Link Protocols, Static & Dynamic Channel Allocation, Introduction to IEEE standards, Sliding Window Protocols: One-bit Sliding Window Protocol, Go Back n, Selective Repeat.

(No. of Periods: 15)

SECTION-C

4. Network Layer : Design issues, Routing Algorithms: Shortest path routing, Flooding, Flow-Based Routing, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast & Multicast routing. Congestion Control Algorithms & internetworking, Network Layer in The Internet: The IP Protocol, IP Addresses, Subnets, IPv4 and IPv6.

(No. of Periods: 15)

SECTION-D

5. Application Layer : Network Security & Privacy, Data Compression & Cryptography, Electronic Mail, Remote Login, File Transfer.

(No. of Periods: 15)

References :

1. Tannenbaum, A.S., 2003 : Computer Networks, Prentice Hall.
2. Stallings, William, 2008 : Local and Metropolution Area Networks : An Introduction, Macmillian Publishing Co.
3. Black : Data Network, Prentice Hall of India.

BCA : 604 Minor Project and Seminar

Paper Code : BCA - 604

Paper Title : Based on BCA- 601

Theory Marks : 90

Project and Seminar must be taken up from the real life problems. Marks for these are to be given on the basis of Programming Style, User friendly I/O, on-line help and documentation (user Manual). This work will carry 100 marks, (90 Marks for Project and Seminar Viva; and 10 Marks for Internal Assessment).

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