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

<table>
<thead>
<tr>
<th>Paper Code</th>
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*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 the 2nd Semester, he/she/they be allowed to appear/qualify the same in the 4th or 6th Semester/s.*
### Third Semester

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Subject</th>
<th>LT/ Week</th>
<th>Theory Marks</th>
<th>Internal Assessment</th>
<th>Exam. Hours</th>
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**Total**

|             |                             | 24 | 1 | 12 | 37 | 40 | 360 | 400 | 16            |

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**Total**

|             |                             | 24 | 1 | 12 | 37 | 40 | 360 | 400 | 16            |
FIRST SEMESTER
FIRST SEMESTER
English (Compulsory) – A
BCA-16-101

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

Time Duration : 3Hrs. Number of Lectures : 60

Semester I

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)
   10 marks

II) Prose (1 to 3)
   Long essay type question on Summary/Theme (one out of two with internal choice)
   10 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 (a small Paragraph) 5 marks
   OR
   For Foreign Students (Paraphrase of Poetry Passage)
4) Official, Business and Letters to the Editors 5 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:
1. The Question Paper will consist of Four Sections.
2. Examiner will set total of NINE questions comprising TWO questions from each Section and ONE compulsory question of short answer type covering whole syllabi.
3. The students are required to attempt ONE question from each Section and the Compulsory question.
4. All questions carry equal marks unless specified.
5. The student can use only Non-programmable & Non-storage type of Calculator.
6. 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


SECTION-D


Reference Books:

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, DLETREE, DEFRAI, SCANDISK, UNDELETE. Batch Files: Introduction to simple batch files; Introduction to CONFIG.SYS and AUTOEXEC.BAT files.

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:
4. OOoAuthors Team: Getting Started with OpenOffice.org 3.3, Friends of OpenDocument
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


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 Handling functions (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:**
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:

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 unattempted 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.
5. How to obtain Driving License.
7. Common Driving mistakes.
8. Significance of First-aid in Road Safety.
9. Role of Civil Society in Road Safety.

**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**
2. Road Safety Signage and Signs (2011), Ministry of Road Transport and Highways, Government of India.

**Websites:**
(a) [www.chandigarhpolice.nic.in](http://www.chandigarhpolice.nic.in)
(b) [www.punjabpolice.gov.in](http://www.punjabpolice.gov.in)
(c) [www.haryanapolice.gov.in](http://www.haryanapolice.gov.in)
(d) [www.hppolice.nic.in](http://www.hppolice.nic.in)
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:


   3.2 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 purposes 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 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
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) **10 marks**

2) **Prose (4-5)**
   - Long essay type question on Summary/Theme (one out of two with internal choice) **10 marks**

3) **Poetry (7-11)**
   - 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 (isolated sentences)** **5 marks**
   - OR
   - For Foreign Students (Paraphrase of Poetry Passage)

4) **Transformation of all types (5 out of 5)** **5 marks**
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:


Fundamentals of Web Programming
BCA-16-203

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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

JavaScript: 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


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:

2. Bayross, Ivan: HTML, DHTML, JavaScript by BPB, Latest reprint
4. Thomas Powell: HTML & CSS: The Complete Reference
8. David Powers: The Essential Guide to Dreamweaver CS4
Object Oriented Programming using C++  
BCA-16-204

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:**

2. E. Balaguruswamy, 2008: Object Oriented Programming with C++, TMH.
### Third Semester

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### Fourth Semester

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THIRD SEMESTER
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 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.

(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:

   (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,

   (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 :**

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

   (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

   (No. of Periods : 15)
References:


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

Theorv 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


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


Function Overloading & Operator Overloading

(No. of Periods : 15)

SECTION-C

3. Inheritance - Concept of inheritance, Base class, Defining derived classes, Visibility 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
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.

References


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

   (Total No. of Periods – 15)

SECTION-B

   (Total No. of Periods – 15)

SECTION-C

   (Total No. of Periods – 15)
SECTION – D


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

(Total No. of Periods – 15)

References :


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 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


(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.


(No. of Periods : 15)

References :


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


   Structure of UNIX: Kernel, Shell. UNIX Directory system

   (No. of Periods : 15)

SECTION-B


   (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


(No. of Periods : 15)

References :


Paper Code : BCA-404
Paper Title : Computer Lab.-2: Based on BCA - 402 and BCA - 403
Marks : 50
FIFTH SEMESTER
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Subject</th>
<th>LT/ Week</th>
<th>Theory Marks</th>
<th>Internal Assessment</th>
<th>Exam. Hours</th>
<th>Paper Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.</td>
<td>Enterpreneurship Development Programme</td>
<td>4</td>
<td>90</td>
<td>10</td>
<td>3</td>
<td>BCA-501</td>
</tr>
<tr>
<td>20.</td>
<td>Discrete Mathematics in Computer Science</td>
<td>5</td>
<td>90</td>
<td>10</td>
<td>3</td>
<td>BCA-503</td>
</tr>
<tr>
<td>21.</td>
<td>Computer Lab.: Based on BCA-502</td>
<td>5</td>
<td>90</td>
<td>10</td>
<td>4</td>
<td>BCA-504</td>
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</table>

**Sixth Semester**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Subject</th>
<th>LT/ Week</th>
<th>Theory Marks</th>
<th>Internal Assessment</th>
<th>Exam. Hours</th>
<th>Paper Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.</td>
<td>Web Programming</td>
<td>5</td>
<td>90</td>
<td>10</td>
<td>3</td>
<td>BCA-601</td>
</tr>
<tr>
<td>23.</td>
<td>Computer Organization</td>
<td>5</td>
<td>90</td>
<td>10</td>
<td>3</td>
<td>BCA-602</td>
</tr>
<tr>
<td>24.</td>
<td>Computer Networks</td>
<td>5</td>
<td>90</td>
<td>10</td>
<td>3</td>
<td>BCA-603</td>
</tr>
<tr>
<td>24.</td>
<td>Minor Project and Seminar Based on BCA-601</td>
<td>5</td>
<td>90</td>
<td>10</td>
<td>4</td>
<td>BCA-604</td>
</tr>
</tbody>
</table>
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 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. 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.

   (No. of Periods: 25)

SECTION - D

   (No. of Periods: 25)
References:


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**

1. A Survey of Computer Graphics:
   (No. of Periods : 15)

2. Overview of Graphics Systems:
   (No. of Periods : 10)

**SECTION-B**

   - 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)

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

Multimedia Technology :
7. Applications:

SECTION-D

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

References:
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, Algebraic 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


(No. of Periods : 25)
SECTION-D

   (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:


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


(No. of Periods: 25)

References:

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


   (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 organisation: 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


(No. of Periods: 25)

**References:**

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

2. Physical Layer: Transmission Media, Switching, ISDN & its services, Multiplexing, Modems.
   (No. of Periods: 15)

SECTION-B
   (No. of Periods: 15)

SECTION-C
   (No. of Periods: 15)

SECTION-D
   (No. of Periods: 15)
References:

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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