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

First and Second Year (Semester system)
Third Year (Annual System)
Examinations, 2015-2016

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OUTLINES OF TESTS, SYLLABI AND COURSES OF READING FOR
BACHELOR OF COMPUTER APPLICATIONS FOR THE
EXAMINATIONS OF 2015 – 2016

Scheme of Examination, 2015 - 2016

First Semester

Sr. No.	Subject	LT/ Week	Theory Marks	Internal Assessment	Exam. Hours	Paper Code
1.	English (C) – A	6	90	10	3	BCA-101
2	Panjabi/History & Culture of Punjab – A	6	90	10	3	BCA-102
3.	Mathematics in Computer Science - I	6	90	10	3	BCA-103
4.	*Environment & Road Safety Education	-	70	-	1 ½	
		(based on Class Tests and Field Work / Report)				
5.	Computing Software	6	90	10	3	BCA-104
6.	Computer Lab.: Based on BCA - 104	6	90	10	4	BCA-105

Second Semester

7.	English (C) – B	6	90	10	3	BCA-201
8.	Panjabi/History & Culture of Punjab - B	6	90	10	3	BCA-202
9	Mathematics in Computer Science - II	6	90	10	3	BCA-203
10.	Computer Programming & Problem Solving Through "C"	6	90	10	3	BCA-204
11.	Computer Lab.: Based on BCA-204	6	90	10	4	BCA-205

* **The issue regarding the Semester in which the students are to be appear in the compulsory qualifying paper of 'Environment & Road Safety Education' is under consideration and the sorted matter will be uploaded in due course.**

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

THIRD YEAR

1.	Enterpreneurship Development Programme	4	90	10	3	BCA-17
2.	Data Communication & Networks	5	90	10	3	BCA-18
3.	Computer Graphics & Multimedia Applications	5	90	10	3	BCA-19
4.	Internet Programming	5	90	10	3	BCA-20
5.	Discrete Mathematics	5	90	10	3	BCA-27
6.	Project and Seminar	6	85	15		BCA-21
7.	Computer Lab.1: Based on BCA-19	5	90	10	4	BCA-23
8.	Computer Lab.2: Based on BCA-20	5	90	10	4	BCA-24

FIRST SEMESTER

Paper Code : **BCA - 101**

Paper Title : English (Compulsory) - A

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

Paper Code : **BCA - 102**

Paper Title : Punjabi (Compulsory) - A

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

OR

Paper Code : **BCA - 102**

Paper Title : **HISTORY AND CULTURE OF PUNJAB**

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

Paper Code : **BCA - 103**

Paper Title : Mathematics in Computer Science-I

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

Outlines of Test, Syllabi and Courses of Reading for BCA, First Year (English Compulsory) Examination 2015-2016

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 mark**s

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**

ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ - ਬੀ.ਸੀ.ਏ. ਭਾਗ ਪਹਿਲਾ

ਸਮੈਸਟਰ ਪਹਿਲਾ

ਦਸੰਬਰ 2015 ਦੇ ਇਮਤਿਹਾਨ ਲਈ

ਕੁੱਲ ਅੰਕ : 50

ਥਿਊਰੀ : 45

ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ: 05

ਸਮਾਂ: 3 ਘੰਟੇ

ਸਿਲੇਬਸ

1. ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵੀਆਂ ਦੀਆਂ ਚੋਣਵੀਆਂ ਕਵਿਤਾਵਾਂ ਦਾ ਅਧਿਐਨ
2. ਚੋਣਵੀਆਂ ਪੰਜਾਬੀ ਕਹਾਣੀਆਂ ਦਾ ਅਧਿਐਨ
3. ਚੋਣਵੇਂ ਪੰਜਾਬੀ ਲੇਖਕਾਂ ਦਾ ਸੰਖੇਪ ਜੀਵਨ ਤੇ ਰਚਨਾ/ਯੋਗਦਾਨ

ਕੋਰਸ

1. ਸੁਰ-ਸੰਵੇਦਨਾ, ਸੰਪਾ: ਡਾ.ਸਤਿੰਦਰ ਸਿੰਘ ਵਿਚੋਂ ਚੋਣਵੀਆਂ 15 ਕਵਿਤਾਵਾਂ,
   ਪ੍ਰਕਾਸ਼ਕ: ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ ਪਬਲੀਕੇਸ਼ਨ ਬਿਓਰੋ, ਚੰਡੀਗੜ੍ਹ
   (ਭਾਈ ਵੀਰ ਸਿੰਘ- ਗੁਲਾਬ ਦਾ ਫੁੱਲ ਤੋੜਨ ਵਾਲੇ ਨੂੰ, ਵਿਛੋੜਾ-ਵਸਲ, ਖੇੜਾ, ਪੂਰਨ ਸਿੰਘ- ਜਵਾਨ ਪੰਜਾਬ, ਸਮੁੰਦਰ ਕਿਨਾਰੇ ਮੈਂ ਉਡੀਕਾਂ, ਗਰਾਂ ਦਾ ਮਿਹਨਤੀ ਬਲਦ, ਧਨੀ ਰਾਮ ਚਾਤ੍ਰਿਕ- ਰਾਧਾ ਸੰਦੇਸ਼, ਏਕੇ ਦੀ ਬਰਕਤ, ਪੰਜਾਬੀ ਦਾ ਸੁਪਨਾ, ਮੋਹਨ ਸਿੰਘ- ਮਾਂ, ਦੇਸ਼ ਪਿਆਰ, ਹਵਾ ਦਾ ਜੀਵਨ ਅਤੇ ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ- ਆਖਾਂ ਵਾਰਸ ਸ਼ਾਹ ਨੂੰ, ਸੱਤ ਵਰ੍ਹੇ ਅਤੇ ਅਸ਼ੋਕਾ ਚੇਤੀ ਕਵਿਤਾਵਾਂ)
2. ਪੰਜਾਬੀ ਕਥਾ-ਕਿਤਾਬ, ਸੰਪਾ: ਗੁਰਦਿਆਲ ਸਿੰਘ ਵਿਚੋਂ ਚੋਣਵੀਆਂ 6 ਕਹਾਣੀਆਂ
   ਪ੍ਰਕਾਸ਼ਕ: ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਓਰੋ, ਚੰਡੀਗੜ੍ਹ।
   (ਏਹੁ ਨਿਦੋਸਾ ਮਾਰੀਐ, ਸਵਰਗ ਦੀ ਝਲਕ, ਮਾਮਲਾ, ਉਜਾੜ, ਬਸ਼ੀਰਾ ਅਤੇ ਰੱਬ ਤੇ ਰੁੱਤਾਂ ਕਹਾਣੀਆਂ)

ਯੂਨਿਟ ਅਤੇ ਥੀਮ

1.	ਸੁਰ-ਸੰਵੇਦਨਾ ਪੁਸਤਕ ਵਿੱਚੋਂ ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ (2 ਵਿਚੋਂ 1)	5 ਅੰਕ
2.	ਕਿਸੇ ਇੱਕ ਕਵਿਤਾ ਦਾ ਸਾਰ ਜਾਂ ਕੇਂਦਰੀ ਭਾਵ (3 ਵਿਚੋਂ 1)	5 ਅੰਕ
3.	ਇਕ ਕਹਾਣੀ ਦਾ ਸਾਰ (ਪੰਜਾਬੀ ਕਥਾ-ਕਿਤਾਬ ਵਿਚੋਂ)	5 ਅੰਕ
4.	ਕਿਸੇ ਇੱਕ ਕਵੀ ਜਾਂ ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਰਚਨਾ ਅਤੇ ਯੋਗਦਾਨ (ਭਾਈ ਵੀਰ ਸਿੰਘ, ਪ੍ਰੋ.ਮੋਹਨ ਸਿੰਘ, ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ, ਸੁਜਾਨ ਸਿੰਘ, ਸੰਤੋਖ ਸਿੰਘ ਧੀਰ ਅਤੇ ਕੁਲਵੰਤ ਸਿੰਘ ਵਿਰਕ) (2 ਵਿਚੋਂ 1, ਇੱਕ ਕਵੀ ਅਤੇ ਇੱਕ ਕਹਾਣੀਕਾਰ ਵਿੱਚੋਂ)	8 ਅੰਕ
5.	ਲੇਖ : ਸਮਾਜਕ, ਸਭਿਆਚਾਰਕ ਅਤੇ ਆਮ ਵਾਕਫ਼ੀ ਨਾਲ ਸੰਬੰਧਤ (500 ਸ਼ਬਦਾਂ ਤੱਕ)	7 ਅੰਕ
6.	ਸ਼ਬਦ ਸ਼ੁੱਧੀ (10 ਅਸ਼ੁੱਧ ਸ਼ਬਦ-ਜੋੜਾਂ ਵਿੱਚੋਂ 7)	7 ਅੰਕ
7.	ਵਾਕ ਸ਼ੁੱਧੀ (10 ਅਸ਼ੁੱਧ ਵਾਕਾਂ ਵਿੱਚੋਂ 8)	8 ਅੰਕ

ਵਿਸ਼ੇਸ਼ ਨੋਟ : ਸਮੁੱਚੇ ਪਾਠ ਕ੍ਰਮ ਲਈ ਹਫ਼ਤੇ ਵਿਚ 6 ਪੀਰੀਅਡ

6 credit course

SEMESTER I

HISTORY AND CULTURE OF PUNJAB FROM THE EARLIEST TIMES TO 1849

INSTRUCTIONS FOR THE PAPER–SETTER AND CANDIDATES :(FOR PAPER in semester 1 & 2)

1. The syllabus has been divided into four Units.
   There shall be 9 questions in all. The first question is compulsory and shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 25 to 30 words each. The candidates are required to attempt any 5 short answer type questions carrying 5 marks i.e. 1 mark each. Rest of the paper shall contain 4 units. Each Unit shall have two essay type questions and the candidate shall be given internal choice of attempting one question from each Unit-IV in all. Each question will carry 10 marks.
2. For private candidates, who have not been assessed earlier for internal assessment, the marks secured by them in theory paper will proportionately be increased to maximum marks of the paper in lieu of internal assessment.
   The paper-setter must put note (2) in the question paper.
3. One question from Unit-IV shall be set on the map.

Explanation:

1. Each essay type question would cover about one-third or one-half of a topic detailed in the syllabus.
2. The distribution of marks for the map question would be as under:

Map	:	6 Marks
Explanatory Note	:	4 Marks

   In case a paper setter chooses to set a question of map on important historical places, the paper setter will be required to ask the students to mark 5 places on map of 2 marks each and write explanatory note on any two of 2 marks each.
3. The paper-setter would avoid repetition between different types of question within one question paper.

PAPER: HISTORY AND CULTURE OF PUNJAB FROM THE EARLIEST TIMES TO 1849

Max. Marks	:	50
Theory	:	45
Internal Assessment	:	05
Time	:	3 Hours

Objectives: To introduce the students to the history of Punjab region.

Pedagogy: Lectures, library work and discussions.

UNIT I

1. Harappan Civilization: extent and town planning; socio-economic life.
2. Vedic Age: socio-economic life; development of caste; position of women.
3. Religion: vedic religion; impact of Buddhism and Jainism on the region.

UNIT II

4. Society and Culture c. 1000 A.D.: Socio-economic life; religious life; education
5. Cultural Reorientation: main features of Bhakti; origin and development of Sufism
6. Society and Culture c. 1500A.D: socio-economic life under the Lodhis; religious beliefs and practices- Vainavism, Shaivism, Shaktism, Islam.

UNIT III

7. Sikhism: new ideology of Guru Nanak; evolution of Sikh community-guruship,manji,masand; new institutions-gurdwara, sangat-pangat.
8. Transformation of Sikhism: martyrdom of Guru Arjan; martyrdom of Guru Tegh Bahadur; impact.
9. Institution of Khalsa: new baptism; significance

UNIT IV

10. Changes in Society: social unrest; emergence of new rulers-rakhi, gurmata, dal khalsa.
11. Society and Culture under Maharaja Ranjit Singh: social mobility; painting and architecture; literature.
12. MAP: Major Historical Places: Harappa, Mohenjodaro, Sanghol, Ropar, Lahore, Amritsar, Kiratpur, Anandpur Sahib, Tarn Taran, Machhiwara, Goindwal, Khadur Sahib.

Suggested Readings:

1. Joshi, L.M (ed.) : History and Culture of the Punjab, Part-I, Publication Bureau, Punjabi University, Patiala, 1989 (3rd edn.)
2. Joshi, L.M and Singh, Fauja (ed.) : History and Culture of the Punjab, Vol. I, Punjabi University, Patiala, 1977
3. Prakash, Buddha : Glimpses of Ancient Punjab, P.U., Patiala, 1983
4. Thapar, Romila : A History of India, Vol. I, Penguin Books, 1966
5. Basham, A.L : The Wonder That was India, Rupa Books, Calcutta (18th rep.),1992
6. Sharma, B.N : Life in Northern India, MunshiRam Manohar Lal, Delhi, 1966
7. Singh,Kirpal :History and Culture os the Punjab, Part II(Medieval Period), Publication Bureau, Punjabi University, Patiala 1990(3rd edn.).
8. Singh, Fauja(ed.) :History of the Punjab, Vol.III, Punjabi University, Patiala 1972.
9. Grewal, J.S. :The Sikhs of the Punjab, the New Cambridge History of India, Orient Longman, Hyderabad,1990.
10. Singh, Khuwant :A History of the Sikhs, vol I: 1469-1839, oxford University Press,. Delhi, 1991.

11. Chopra, P.N.,Puri, B.N.:A Social, Cu.ltural and Economic History of India, Vol.II, And Das,M.N. Macmillan, delhi, 1974.
12. Hussain ,Yusuf : Glimpse of Medieval Indian Culture, Asia Publishing House, Bombay, 1973(rep.).

Note: The following categories of the students shall be entitled to take option of History & Culture of Punjab in lieu of Punjabi as compulsory subject:

A. That the students who have not studied Punjabi upto class 10^{th}.
B. Ward of / and Defence Personnel and Central Govt. Employee/Employees who are transferrable on all India basis.
C. Foreigners

Paper Code : **BCA - 103**

Paper Title : Mathematics in Computer Science-I

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

Objectives : To provide basic mathematical foundation required for various computer science courses.

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 of Calculator.**

SECTION-A

1. Fundamental Principles of Counting :

Concept of c (n, r). Binomial Theorem: Statement only for positive index, general and middle terms. Binomial Theorem for any index (Without Proof) applications of Binomial Theorem for approximation and properties of Binomial Coefficients.

SECTION-B

2. Trigonometry-I :

Trigonometric Ratios of allied angles, Trigonometric ratios of Compound angles or addition and subtraction formulae.

SECTION-C

3. Trigonometry-II :

Transformation Formulae, Trigonometric ratios of multiple angles.

SECTION-D

4. Limit and Continuity :

Rules for finding Limits, Infinite Limits, Continuity at a point, Rules of continuity, Continuity on an Interval.

References :

1. Schaum Series, 1982 : Theory & Problem of Essential Computer Mathematics, McGrawHill, New York.
2. Grimaldi, Ralph P., 2003 : Discrete and Combinational Mathematics, Pearson Education, Singapore.
3. Rao, G. Shanker, 1999 : Mathematics for Computer Science, Kalyani Publishers

Paper Code : BCA – 104
Paper Title : Computing Software
Theory Marks : 90 Number of Lectures : 60
(45 minutes duration)

Objective: The objective of this course is to familiarize students with Fundamentals of Information Technology and its applications.

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 of Calculator.**

SECTION – A

1. **Computer Appreciation**: Introduction, characteristics of computer; History of computers; classification of computers on size, architecture and chronology; Applications of computers; commonly used terms–Hardware, Software, Firmware. Types of software: System and Application software; Computer Architecture and organisation; Input, Process and Output; Representation of information: BIT, BYTE, Memory, Memory size; Units of measurement of storage; Input/Output devices; Secondary storage devices; Programming Languages: Generation of Languages; Translators - Interpreters, Compilers, Assemblers and their comparison. DOS : Versions of

DOS: Booting sequence; Warm and Cold reboot; Concept of File and directory, Redirecting command input and output 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.

(No. of Periods : 15)

SECTION-B

2. **Graphical User Interface:** Fundamentals of Windows, types of Windows, anatomy of windows, Icons, Recycle bin, Operations on Folders, Control panel.

Word Processing Package: Basics of Word Processing; Opening and Closing of documents; Text creation and Manipulation; Finding and replacing text, Printing of document, Formatting of text; Margin setting, Adding Borders and shading, Adding Headers and Footers, Setting up Multiple columns, Working with tables, Spell check, Grammar facility, Autotext, language setting and thesaurus; Mail merging. *Installation of Word Processing Software .*

(No. of Periods : 15)

SECTION-C

3. Spreadsheet Package : Worksheet Basics, Data Entry in Cells : Entry of numbers, text and formulae, Moving data in a worksheet, Moving around in a worksheet, Selecting Data Range, Using the Interface (Toolbars, Menus), Editing Basics, Working with workbooks, Cell referencing; Formatting and Calculations : using Autofill, Working with Formulae, Efficient Data Display with Data formatting (number formatting, date formatting etc.), Working with Ranges, Worksheet Printing; Working with Graphs and Charts : Creating Embedded Chart using chartwizard, sizing and moving parts, updating charts, Changing chart types, Chart wizard, Adding Titles, Legends and Gridlines, Printing Charts; Database Management. Finding records with Data form, Adding/Deleting Records, Filtering Records in a worksheet; Functions and Macros: Worksheet Creating Macros, Recording Macros, Running Macros, Assigning Macros to Buttons, Defining Macros from Scratch. Multiple worksheets. *Installation of Spreadsheet software*.

Presentation Packages: Basics, General Features, Creating a presentation, Incorporation of Animation, Installation of Presentation software.

(No. of Periods : 15)

SECTION-D

4. Internet and WWW : Evolution of Internet, services provided on Internet, Access Methods, Future of Internet, Fundamentals of WWW, HTML : Introduction to HTML, Building blocks of HTML, lists, links, images, tables, frames, forms layers, HTML editor: *Frontpage, Dreamweaver.*

(No. of Periods : 15)

References :

1. Basandra, S.K., 2008 : Computers Today, Galgotia.
2. Sinha P.K. : Computer Fundamental, 6th Edition, BPB Publication
3. Mathur Rajiv, 1995 : DOS 6.2 Quick Reference, Galgotia.
4. Mathur Rajiv, 1996 : Learning Word 6 for Windows Step-by-Step, Galgotia.
5. Mathur Rajiv, 1996 : Learning Excel 5 for Windows Step-by-Step, Galgotia.
6. Kasser, Barbara, 1998 : Using the Internet, PHI, 4th ed., New Delhi.
7. Wall, David A. & Others, 1996 : Using the World Wide Web, PHI. 2nd ed. New Delhi.

Paper Code : BCA -105

Paper Title : Computer Lab.-1 Based on BCA - 104

Theory Marks : 90

SECOND SEMESTER

Paper Code : **BCA - 201**

Paper Title : English (Compulsory) - B

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

Paper Code : **BCA - 202**

Paper Title : Punjabi (Compulsory) - B

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

Paper Code : **BCA - 202**

Paper Title : **HISTORY AND CULTURE OF PUNJAB - B**

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

Paper Code : **BCA - 203**

Paper Title : Mathematics in Computer Science-II

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

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**

ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ - ਬੀ.ਸੀ.ਏ. ਭਾਗ ਪਹਿਲਾ

ਸਮੈਸਟਰ ਦੂਜਾ

ਅਪ੍ਰੈਲ /ਮਈ 2016 ਦੇ ਇਮਤਿਹਾਨ ਲਈ

ਕੁੱਲ ਅੰਕ : 50

ਥਿਊਰੀ : 45

ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ: 05

ਸਮਾਂ: 3 ਘੰਟੇ

ਸਿਲੇਬਸ

1. ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵੀਆਂ ਦੀਆਂ ਚੋਣਵੀਆਂ ਕਵਿਤਾਵਾਂ ਦਾ ਅਧਿਐਨ
2. ਚੋਣਵੀਆਂ ਪੰਜਾਬੀ ਕਹਾਣੀਆਂ ਦਾ ਅਧਿਐਨ
3. ਚੋਣਵੇਂ ਪੰਜਾਬੀ ਲੇਖਕਾਂ ਦਾ ਸੰਖੇਪ ਜੀਵਨ ਤੇ ਰਚਨਾ/ਯੋਗਦਾਨ

ਕੋਰਸ

1. ਸੁਰ-ਸੰਵੇਦਨਾ, ਸੰਪਾ: ਡਾ.ਸਤਿੰਦਰ ਸਿੰਘ ਵਿਚੋਂ ਚੋਣਵੀਆਂ 15 ਕਵਿਤਾਵਾਂ, ਪ੍ਰਕਾਸ਼ਕ: ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ ਪਬਲੀਕੇਸ਼ਨ ਬਿਓਰੋ, ਚੰਡੀਗੜ੍ਹ
(ਫ਼ੀਰੋਜ਼ਦੀਨ ਸ਼ਰਫ਼- ਪੰਜਾਬ, ਭਾਰਤ, ਮਾਂ ਦਾ ਦਿਲ, ਨੰਦ ਲਾਲ ਨੂਰਪੁਰੀ- ਭੋਲਾ ਪੰਛੀ, ਚੁੰਮ ਚੁੰਮ ਰਖੋ, ਸ਼ੌਕਣ ਮੇਲੇ ਦੀ, ਸ਼ਿਵ ਕੁਮਾਰ- ਲੱਛੀ ਕੁੜੀ, ਕੀ ਪੁੱਛਦਿਉ ਹਾਲ ਫ਼ਕੀਰਾਂ ਦਾ, ਬਿਰਹੜਾ, ਪਾਸ਼- ਇਨਕਾਰ, ਅਸੀਂ ਲੜਾਂਗੇ ਸਾਥੀ, ਗੀਤ, ਸੁਰਜੀਤ ਪਾਤਰ- ਖ਼ਤਾਂ ਦੀ ਉਡੀਕ, ਗ਼ਜ਼ਲ (ਕੋਈ ਡਾਲੀਆਂ 'ਚੋਂ) ਅਤੇ ਗ਼ਜ਼ਲ (ਮੇਰਾ ਸੂਰਜ ਡੁਬਿਆ ਹੈ) ਕਵਿਤਾਵਾਂ)

2. ਪੰਜਾਬੀ ਕਥਾ-ਕਿਤਾਬ, ਸੰਪਾ: ਗੁਰਦਿਆਲ ਸਿੰਘ ਵਿਚੋਂ ਚੋਣਵੀਆਂ 6 ਕਹਾਣੀਆਂ, ਪ੍ਰਕਾਸ਼ਕ: ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਓਰੋ, ਚੰਡੀਗੜ੍ਹ।
(ਗਧੀ ਵਾਲਾ, ਕੁਰਸੀ, ਬਾਕੀ ਸਭ ਸੁੱਖ-ਸਾਂਦ ਹੈ, ਰੋਹੀ ਬੀਆਬਾਨ, ਜਿੱਥੋਂ ਸੂਰਜ ਉੱਗਦਾ ਹੈ ਅਤੇ ਪਰਛਾਵੇਂ ਕਹਾਣੀਆਂ)

ਯੂਨਿਟ ਅਤੇ ਥੀਮ

1. ਸੁਰ-ਸੰਵੇਦਨਾ ਪੁਸਤਕ ਵਿੱਚੋਂ ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ (2 ਵਿਚੋਂ 1) 5 ਅੰਕ
2. ਕਿਸੇ ਇੱਕ ਕਵਿਤਾ ਦਾ ਸਾਰ ਜਾਂ ਕੇਂਦਰੀ ਭਾਵ (4 ਵਿਚੋਂ 1) 5 ਅੰਕ
3. ਇਕ ਕਹਾਣੀ ਦਾ ਸਾਰ (ਪੰਜਾਬੀ ਕਥਾ-ਕਿਤਾਬ ਵਿਚੋਂ) 5 ਅੰਕ
4. ਕਿਸੇ ਇੱਕ ਕਵੀ ਜਾਂ ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਰਚਨਾ ਅਤੇ ਯੋਗਦਾਨ 8 ਅੰਕ
(ਸ਼ਿਵ ਕੁਮਾਰ, ਪਾਸ਼, ਸੁਰਜੀਤ ਪਾਤਰ, ਗੁਰਦਿਆਲ ਸਿੰਘ, ਰਘੁਬੀਰ ਢੰਡ ਅਤੇ ਵਰਿਆਮ ਸੰਧੂ)
(2 ਵਿਚੋਂ 1, ਇੱਕ ਕਵੀ ਅਤੇ ਇੱਕ ਕਹਾਣੀਕਾਰ ਵਿੱਚੋਂ)
5. ਕਾਲਜ ਨਾਲ ਸਬੰਧਤ ਪ੍ਰੈਸ-ਨੋਟ (2 ਵਿਚੋਂ 1) 8 ਅੰਕ
6. ਕਾਰੋਬਾਰੀ ਇਸ਼ਤਿਹਾਰ (2 ਵਿਚੋਂ 1) 7 ਅੰਕ
7. ਵਿਸ਼ਰਾਮ ਚਿੰਨ੍ਹ 7 ਅੰਕ

ਵਿਸ਼ੇਸ਼ ਨੋਟ : ਸਮੁੱਚੇ ਪਾਠ ਕ੍ਰਮ ਲਈ ਹਫ਼ਤੇ ਵਿਚ 6 ਪੀਰੀਅਡ

6 credit course

SEMESTER II

HISTORY AND CULTURE OF PUNJAB IN THE COLONIAL AND POST INDEPENDENCE TIMES

INSTRUCTIONS FOR THE PAPER –SETTER AND CANDIDATES: (FOR PAPER in semester 1 AND 2)

1. The syllabus has been divided into four Units.
   There shall be 9 questions in all. The first question is compulsory and shall be short answer type containing 10 short questions spread over the whole syllabus to be answered in about 25 to 30 words each. The candidates are required to attempt any 5 short answer type questions carrying 5 marks i.e. 1 mark each. Rest of the paper shall contain 4 units. Each Unit shall have two essay type questions and the candidate shall be given internal choice of attempting one question from each Unit-IV in all. Each question will carry 10 marks.
2. For private candidates, who have not been assessed earlier for internal assessment, the marks secured by them in theory paper will proportionately be increased to maximum marks of the paper in lieu of internal assessment.
   The paper-setter must put note (2) in the question paper.
   3. One question from Unit-IV shall be set on the map.

Explanation:

1. Each essay type question would cover about one-third or one-half of a topic detailed in the syllabus.
2. The distribution of marks for the map question would be as under:
   Map : 6 Marks
   Explanatory Note : 4 Marks

   In case a paper setter chooses to set a question of map on important historical places, the paper setter will be required to ask the students to mark 5 places on map of 2 marks each and write explanatory note on any two of 2 marks each.
3. The paper-setter would avoid repetition between different types of question within one question paper.

PAPER: HISTORY AND CULTURE OF PUNJAB FROM THE EARLIEST TIMES TO 1849

Max. Marks : 50
Theory : 45
Internal Assessment : 05
Time : 3 Hours

Objectives: To introduce the students to the history of Punjab region in modern times.

Pedagogy: Lectures, library work and discussions.

UNIT I

1. Introduction of Colonial Rule: administrative changes; means of communication; western education.
2. Agrarian Development: Commercialization of agriculture; canalization and colonization.
3. Social Classes: agrarian groups; new middle classes

UNIT II

4. Early Socio Religious Reform: Christian Missionaries; Namdharis; Nirankaris.
5. Socio Religious Reform Movements: activities of Arya Samaj; Singh sabhas; Ahmadiyas.
6. Development of Press & literature: growth of press; development in literature

UNIT III

7. Emergence Of Political Consciousness: Agrarian uprising 1907; Ghadar.
8. Gurudwara Reform Movement: Jallianwala Bagh; foundation of SGPC and Akali Dal; Morchas.
9. Struggle for Freedom: activities of revolutionaries - Babbar Akalis, Naujawan Bharat Sabha; participation in mass movements – non co-operation, civil disobedience, Quit India.

UNIT IV

10. Partition and its Aftermath: resettlement; rehabilitation
11. Social Concerns In Post Independence Punjab: language; immigration; socio-economic issues.
12. MAP: Major Historical places: Delhi, Kurukshetra, Jaito, Ferozepur, Ambala, Amritsar, Lahore, Ludhiana, Qadian, Jalandhar, Lyallpur, Montgomery.

Suggested Readings:

1. Singh,Kirpal :History and Culture os the Punjab, Part II(Medieval Period), Publication Bureau, Punjabi University, Patiala 1990(3rd edn.).
2. Singh, Fauja(ed.) :History of the Punjab, Vol.III, Punjabi University, Patiala 1972.
3. Grewal, J.S. :The Sikhs of the Punjab, the New Cambridge History of India, Orient Longman, Hyderabad,1990.
4. Singh, Khuwant :A History of the Sikhs, vol I: 1469-1839, oxford University Press,. Delhi, 1991.
5. Chopra, P.N.,Puri, B.N. And Das,M.N. :A Social, Cu.ltural and Economic History of India, Vol.II, Ma Macmillan, delhi, 1974.

Paper Code	**: BCA - 203**	
Paper Title	: Mathematics in Computer Science-II	
Theory Marks	: 90	Number of Lectures : 60 (45 minutes duration)

Objectives : To provide basic mathematical foundation required for various computer science courses.

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. Derivatives :

The derivative of a function, Calculating derivatives from the definition, Differentiability on an interval, Differentiation Rules, Rates of Change, Derivatives of Trigonometric Functions, The Chain Rule, Derivative of Implicit, Rational and Exponential Functions, Rolle's theorem, Lagrange Mean Value Theorem.

SECTION-B

2. Integration-I :

Indefinite Integrals, Integration by substitution, Integration of Transcendental Functions: Inverse Functions, Natural Logarithm, The Exponential Function.

SECTION-C

3. Integration-II :

Integration by parts, Definite Integrals, Properties, Area under the curve.

SECTION-D

4. Matrix Operations :

Introduction and definition of matrix, types of matrices, Matrix addition, Subtraction and scalar multiplication, Matrix multiplication, Transpose of a matrix, adjoint of a matrix and inverse of a matrix, solution of system of linear equations, definition and properties of a determinant.

References :

1. Schaum Series, 1982 : Theory & Problem of Essential Computer Mathematics, McGrawHill, New York.
2. Grimaldi, Ralph P., 2003 : Discrete and Combinational Mathematics, Pearson Education, Singapore.
3. Rao, G. Shanker, 1999 : Mathematics for Computer Science, Kalyani Publishers, New Delhi.

Paper Code : BCA - 204
Paper Title : Computer Programming & Problem Solving Through "C"
Theory Marks : 90 Number of Lectures : 60 (45 minutes duration)

Objectives: The objective of this course is to make the student understand programming language concepts, 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 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. **Algorithm and Programming Development:** Steps in development of a program, Flow Charts, Algorithm Development, Program Debugging, Compilation and Execution. Overview of C: History of C, Importance of C, Structure of a C Program. Elements of C: character set, identifiers and keywords, Data types, Constants and Variables, Assignment statement, Symbolic constant. Input/output: Unformatted & formatted I/O function in C, Input functions: scanf(), getch(),getche(), getchar(), gets(); output functions: printf(), putch(), putchar(), puts().

(No. of Periods : 15)

SECTION-B

2. **Operators & Expressions:** Arithmetic, relational, logical, bitwise, unary, assignment, conditional operators and special operators. Arithmetic expressions, evaluation of arithmetic expression, type casting and conversion, operator hierarchy & associativity. Decision making & branching: Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder, switch statement, goto statement. Decision making & looping: For, while, and do-while loop, jumps in loops, break, continue. Functions: Introduction to Functions, Function Declaration, Function Categories, Standard Functions, Parameters Passing, Call – by value/reference, Recursion, Global and Local Variables, Storage classes.

(No. of Periods : 15)

SECTION-C

3. **Arrays:** Introduction to Arrays, Array Declaration, Single and Multidimensional Array, Memory Representation. Structure and Union: Declaration of structure, Accessing structure members, Structure Initialization, Arrays of structure, nested structures, Unions.

(No. of Periods : 15)

SECTION-D

4. **String:** Introduction of string, declaring and initializing string variables, reading and writing strings, string handling functions. Pointers: Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointers and Arrays. Files: Introduction, Creating a data file, opening and closing a data file, processing a data file.

(No. of Periods : 15)

References :

1. Byron S. Gottfried, 1996 : Programming in C, McGraw Hills Publishers, New York
2. Salaria, R. S. : Test Your Skills in C, Khanna Book Publishing Ltd.,
3. *Salaria,R.S.* *Problem Solving And Programming in C, Khanna*
4. Kanetkar Yashwant, 2010 : Let us Exploring C, BPB Publications, New Delhi.
5. Balaguruswami, C., 2008 : Programming with C Language, Tata McGraw Hill, New
6. Somashekara, M.T. , 2008 : Programming in C, Prentice Hall of India.

Paper Code	:	BCA - 205
Paper Title	:	Computer Lab.-2 Based on BCA - 204
Theory Marks	:	90

Third Semester

Paper Code **BCA-301**
Paper Title **Computer Based Numerical & Statistical Method**

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

Objective : Discuss the basic techniques in Numerical 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 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.**
	(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 language.

(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 stack, lists, queue, trees and graphs are introduced in this subject. The implementation of these algorithms will be discussed using 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 Calculator.**

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 Co. (P.) Ltd., New Delhi.
4. Salaria, R. S. : 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: This course will help students to understand object oriented programming concepts and implement them for real life problems using C++ programming language features.

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. 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 and 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, Addison-Company.
2.	Robert Lafore,	:	Object Oriented Programming in Turbo C++,4th Edition, Galgotia Pub.
	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

Paper 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 Calculator.**

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 & its 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 the 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.

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

Paper Code : BCA-404

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

Marks : 50

SYLLABI AND COURSES OF READING FOR BACHELOR OF COMPUTER APPLICATIONS FOR THE EXAMINATION OF 2015

THIRD YEAR

Paper Code : BCA-17
Paper Title : Enterpreneurship Development Programme
Theory Marks : 90 Number of Lectures : 100
(45 minutes duration)

Objectives : EDPs aim at training in entrepreneurial traits so that students obtain adequate information, motivation and guidance in setting up their own enterprises. In order to maintain a homogeneous nature of participating groups, EDPs focus on rural entrepreneurs, women, SC/ST, minority communities etc.

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.

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, Seth Publishers, 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-18
Paper Title : Data Communication & Networks
Theory Marks : 90 Number of Lectures : 100
(45 minutes duration)

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

SECTION-A

1. Introduction : 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 service. Multiplexing, Modems.
(No. of Periods : 25)

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 Protocol. (No. of Periods : 25)

SECTION-C

4. Network Layer : Design issues, Routing Algorithms, Shortest path routing, Flooding, Broadcast & Multicast routing congestion, Control & internetworking.
(No. of Periods : 25)

SECTION-D

5. Application Layer : Network Security & Privacy, Data Compression & Cryptography. Electronic Mail, The WWW, Multimedia, Audio, Video, Remote Login, File Transfer.
(No. of Periods : 25)

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.

Paper Code : BCA-19
Paper Title : Computer Graphics and Multimedia Applications
Theory Marks : 90

Number of Lectures : 100
(45 minutes duration)

Objectives :

- To study the graphics techniques and algorithms.
- To study the multimedia concepts and various I/O technologies.
- To enable the students to develop their creativity.

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.

SECTION-A

Computer Graphics :

1. A Survey of Computer Graphics :
Computer Aided Design, Presentation Graphics, Computer art, Entertainment, Education and Training, Visualization, Image Processing, Graphical User Interfaces.

(No. of Periods : 15)

2. Overview of Graphics Systems :
Video Display Devices, Raster Scan Systems, Random Scan Systems. Graphics Monitors and Workstations, Input Devices, Hard-copy devices, Graphics Software.

(No. of Periods : 10)

SECTION-B

3. Studying the Features and Developing Computer Graphics Using Standard Graphics packages like Auto CAD and Paint Brush.

(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 curves, Histograms, Pie charts and human face. (No. of Periods : 15)

SECTION-C

Multimedia Applications :

5. Multimedia in use, Introducing multimedia, What is multimedia ? using multimedia.

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

(No. of Periods : 25)

SECTION-D

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

8. Studying features and use of Multimedia Image Processing authoring tools like photo shop,

Macromedia Director.

(No. of Periods : 25)

References :

1.	Hearn and Backe, 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.

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Paper Code : BCA-20
Paper Title : Internet Programming
Theory Marks : 90

Number of Lectures : 100
(45 minutes duration)

Objectives :

- Explain JAVA and HTML tools for Internet programming.
- Describe scripting languages – Java Script.
- Explain dynamic HTML programming.
- Explain Server Side Programming tools.

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.

SECTION-A

1. Review of forms in HTML, Java Script: Features, tokens, data types, variables, operations, control structs 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 lode, Java virtual machine, constants, variables, data types, operators, expressions, control structures, defining class, creating objects, accessing class members, constructions, method overloading.

(No. of Periods : 25)

SECTION-C

3. 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.

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, Layout Managers and Menus, String handling and event handling.

   (No. of Periods : 25)

References :

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1. Daniel Dang, 2010 : An Introduction to Java Programming, PHI, New Delhi.

2. Balaguruswamy, E., 1998 : Programming with Java, A Primer, TMH, New Delhi.

3. Wanger & Wyke, 2000 : Java Script Unleased, Techmedia, New Delhi, 2000.

Paper Code : BCA-27
Paper Title : Discrete Mathematics
Theory Marks : 90 Number of Lectures : 100
(45 minutes duration)

Objectives : 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 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.

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

BCA : 21 PROJECT and SEMINAR

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, (85 Marks for Project and Seminar Viva; and 15 Marks for Internal Assessment).

Paper Code : BCA-23

Paper Title : Computer Lab.-1 : Based on BCA-19

Theory Marks : 90

Paper Code : BCA-24

Paper Title : Computer Lab.-2 : Based on BCA-20

Theory Marks : 90

Published by : **Professor A.K. Bhandari, Registrar, Panjab University, Chandigarh.**