(P.G. DEPARTMENT OF COMPUTER SCIENCE)

OUTLINES OF TESTS,
SYLLABI AND COURSES OF READING

FOR

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(SEMESTER SYSTEM)

SECOND YEAR (Semester III & IV)

(2020-21, 2021-22 and 2022-23 Sessions)

FACULTY OF COMPUTING SCIENCES

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib

An Autonomous College

Affiliated to Punjabi University, Patiala

APPROVED
Board of Studies Meeting held on 29th June 2020

SYLLABI, OUTLINES OF PAPERS AND TESTS FOR

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

Second Year - Third Semester Examinations

For Session 2020-21, 2021-22, 2022-23

PAPER CODE	NAME OF SUBJECT	HOURS PER WEEK				EXAMINATION SCHEME MARKS				
		L	T	P	TOTAL	Internal	External	Practical	Total	Credits
BCA-201	Object Oriented Programming using C++	4	--	--	4	30	70	--	100	4
BCA-202	Data Structure	4	--	--	4	30	70	--	100	4
BCA-203	Relational Database Management System with Oracle	4	--	--	4	30	70	--	100	4
BCA-204	Software Engineering	4	--	--	4	30	70	--	100	4
BCA-205	GE-III*	5	1	--	6	30	70	--	100	6
BCA-206	Software Lab-V (Based on Paper BCA-201)	--	--	4	4	30	--	70	100	2
BCA-207	Software Lab-VI (Based on Paper BCA-202)	--	--	4	4	30	--	70	100	2
BCA-208	Software Lab-VII (Based on Paper BCA-203)	--	--	4	4	30	--	70	100	2
PBCA-301 A,B	Punjabi Compulsory OR Punjabi Mudhla Gyan	2	--	--	2	15	35	--	50	2
TOTAL		**23**	**1**	**12**	**36**	**255**	**385**	**210**	**850**	**30**

GE-III*: Any one of the following papers may be opted:

BCA-205 (E1)	Basic Mathematics
BCA-205 (E2)	Quantitative Aptitude

1. **The breakup of marks for the practical will be as under:**
   - i. Internal Assessment 30 Marks
   - ii. Viva Voce (External Evaluation) 40 Marks
   - iii. Practical Performance & write up (External Evaluation) 30 Marks
2. **The breakup of marks for the internal assessment for theory Subjects will be as under:**
   - Mid semester test – I 10 Marks
   - Mid semester test – II 10 Marks
   - Attendance 5 Marks
   - Assignment 5 Marks

APPROVED

SYLLABI, OUTLINES OF PAPERS AND TESTS FOR
BACHELOR OF COMPUTER APPLICATIONS (B.C.A)
Second Year - Fourth Semester Examinations
For Session 2020-21, 2021-22, 2022-23

PAPER CODE	NAME OF SUBJECT	HOURS PER WEEK				EXAMINATION SCHEME MARKS				
		L	T	P	TOTAL	Internal	External	Practical	Total	Credits
BCA-211	Computer Networks	5	1	--	6	30	70	--	100	6
BCA-212	Programming using Java	4	--	--	4	30	70	--	100	4
BCA-213	System Software	5	1	--	6	30	70	--	100	6
BCA-214	Workshop on Adobe Photoshop	--	--	4	4	50	--	50	100	4
BCA-215	GE-IV**	5	1	--	6	30	70	--	100	6
BCA-216	Software Lab-VIII (Based on Paper BCA-212)	--	--	4	2	30	--	70	100	2
PBCA-401 A,B	Punjabi Compulsory OR Punjabi Mudhla Gyan	2	--	--	2	15	35	--	50	2
TOTAL		**21**	**3**	**8**	**30**	**215**	**315**	**120**	**650**	**30**

GE-IV: Students can opt any one of the following papers:**

BCA-215 (E1)	Digital Electronics
BCA-215 (E2)	Computer Oriented Statistical Methods

3. The breakup of marks for the practical will be as under:

i. Internal Assessment 30 Marks
ii. Viva Voce (External Evaluation) 40 Marks
iii. Practical Performance & write up (External Evaluation) 30 Marks

4. The breakup of marks for the internal assessment for theory Subjects will be as under:

Mid semester test – I 10 Marks
Mid semester test – II 10 Marks
Attendance 5 Marks
Assignment 5 Marks

BCA-201: Object Oriented Programming using C++
4Credits: (4L)

Teaching Hours per week: 4 **Maximum Marks: 100**
Pass Marks: 35% **Internal Assessment: 30 marks**
External: 70 marks

A) INSTRUCTION FOR THE PAPER SETTER
The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective section of the syllabus carrying 10.5 marks for each question. Section C will consist of 5-10 short answer type questions carrying a total of 28 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

B) INSTRUCTIONS FOR THE CANDIDATES
Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

SECTION-A

Evolution of OOP : Procedure Oriented Programming, OOP Paradigm, Advantages and disadvantages of OOP over its predecessor paradigms.
Characteristics of Object Oriented Programming : Abstraction, Encapsulation, Data hiding, Inheritance, Polymorphism, code Extensibility and Reusability, User defined Data Types.
Introduction to C++ : Identifier and keywords, Constants, Operators
Pointers: Pointer Operations, Pointer Arithmetic, Pointers and Arrays, Multiple indirections, Pointer to functions.
Function : Prototyping, Definition and Call, Scope Rules, Parameter Passing Value, by address and by reference, Functions returning references, Const Functions, recursion, function overloading, Default Arguments, Const Arguments.
Classes, Objects and Members : Class Declaration and Class Definition, Defining member functions, Defining Object, making functions inline, Members access control, Nested Classes, This Pointer.
Object as function arguments, array of objects, functions returning objects, const members and member functions. Static data members and static member functions, Friend functions and Friend classes.

SECTION-B

Constructors : Properties, types of constructors (Default, parameterized and copy), Dynamic constructors, Multiple constructors in classes.
Destructors : Properties, Virtual destructors, Destroying objects, Rules for constructors and destructors, Array of objects.
Dynamic memory allocation using new and delete operators.
Inheritance : Defining derived classes, inheriting private members, single inheritance, types of derivation, function, function redefining, constructors in derived class.
Types of inheritance: Single, Multiple, Multi level and Hybrid,
Types of base classes: Direct, Indirect, Virtual, Abstract, Code Reusability.
Polymorphism : Methods of achieving polymorphic behavior. Polymorphism with pointers, virtual functions, late binding, pure virtual functions and abstract base class.Difference between function overloading, redefining and overriding.
Operator overloading: Overloading binary operator, overloading unary operators, rules for operator overloading, operator overloading using friend function. Function overloading, early binding.

Open/ Close Files commands. Read/write operations on files.

Reference Books:

1. Herbert Schildt, The Complete Reference C++, Tata McGraw-Hill.
2. Deitel and Deital, C++ How to program, Pearson Education.
3. Robert Lafore, *Object Oriented Programming in Turbo C++*, Galgotia Publications.
4. Bajane Stautrup, *The C++ Programming Language*, Addition,-Wesley Publication Co.
5. Stanley B. Lippman, Losee Lajoic, C++. Primer; Pearson Education.
6. E. Balagurusamy, *Object-Oriented Programming with C++*, Tata McGraw-Hill.
7. D. Ravichandran, Programming with C++ , Tata McGraw-Hill Publishing Company Ltd.

BCA-202: DATA STRUCTURES

4Credits: (4L)

Teaching Hours per week: 4 **Maximum Marks: 100**

Pass Marks: 35% **Internal Assessment: 30 marks**

External: 70 marks

A) INSTRUCTION FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective section of the syllabus carrying 10.5 marks for each question. Section C will consist of 5-10 short answer type questions carrying a total of 28 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

B) INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

SECTION A

Basic concepts and notations: Types of data structures, Data structure operations, Mathematical notations and functions, Algorithmic complexity, Big 'O' notation, Time and space trade off.

Arrays: Linear array, representation of array in memory, traversing linear array, insertion and deletion in an array, Two-dimensional array, row major and column major orders, sparse matrix.

Stacks: Representation of stacks in memory (linked and sequential), operations on stacks, Applications of stacks: string reversal, parentheses matching.

Queues: Representation of queues in memory (linked and sequential), operations on queues, insertion in rear, deletion from front.

SECTION B

Linked list: Representation of linked list using static and dynamic data structures, insertion and deletion of a node from linked list, searching in link list, searching in sorted link list.

Trees: Definition and basic concepts, linked representation and representation in contiguous storage, binary tree, binary tree traversal, Binary search tree, searching, insertion and deletion in binary search tree.

Searching and sorting algorithms: Linear and binary search, bubble sort, insertion sort, selection sort, quick sort, merge sort.

Reference Books

1. Seymour Lipschutz, Theory and Practice of Data Structures, McGraw-Hill.
2. Vishal Goyal, LalitGoyal, Pawan Kumar, A Simplified Approach to Data Structures, Shroff Publications.
3. Y. L. Tenenbaum, and A. J. Augenstein, Data Structures using C and C++, PHI.
4. Robert Sedgewick, Algorithms in C, Pearson Education.

BCA-203: Relational Database Management System with Oracle
4Credits: (4L)

Teaching Hours per week: 4 **Maximum Marks: 100**
Pass Marks: 35% **Internal Assessment: 30 marks**
External: 70 marks

A) INSTRUCTION FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective section of the syllabus carrying 10.5 marks for each question. Section C will consist of 5-10 short answer type questions carrying a total of 28 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

B) INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

SECTION-A

Introduction to RDBMS Product and their Features, Difference between DBMS and RDBMS, Relationship among application programs, RDBMS, Basic File Operations: Opening Files, Closing Files, Reading and Writing, Seeking

File Organization: Field and Record structure in file, Record Types, Types of file organization, Sequential, Indexed, and Hashed.

Transaction Management: Transaction Concept, Properties, Transaction States, Concurrent Execution, Serializability, Conflict Serializability, View Serializability, Recoverability, Recoverable Schedule, Cascadless Schedule

Concurrency Control: Lock Based Protocol, Locks, Granting of Locks, Two Phase Locking Protocol, Timestamp Based Protocol, Timestamp, Timestamp ordering protocol, Thomas's Write Rule, Validation Based Protocol, Deadlock Handling, Deadlock Prevention, Deadlock Detection, Deadlock Recovery

SECTION-B

Recovery System: Failure Classification, Transaction Failure, System Crash, Disk Failure, Storage Structures, Storage Types, Data Access, Recovery & Atomicity, Log based Recovery, Deferred Database Modification, Immediate Database Modification, Checkpoints, Recovery with Concurrent Transaction, Transaction Rollback, Restart Recovery, Remote Backup System

Relational Query Language: DDL, DML, DCL.

Introduction to Oracle: Oracle as client/server architecture, getting started, creating, modifying, dropping databases. Inserting, updating, deleting data from databases, SELECT statement, Data constraints (Null values, Default values, primary, unique and foreign key concepts)

Computing expressions, renaming columns, logical operators, range searching, pattern matching, Oracle functions, grouping data from tables in SQL, manipulating dates.

Working with SQL: triggers, use of data base triggers, database triggers Vs. SQL*forms, types of triggers, how to apply database triggers, BEFORE vs. AFTER triggers, combinations, syntax for creating and dropping triggers.

Text Book :

1. B.P. Desai, "Database management system" BPB publications, New Delhi.

Reference Books:

1. C.J. Date, "An Introduction to Data Base Systems", Narosa Publishers

2. Jeffrey D. Ullman, "Principles of Database Systems", Galgotia Pub.
3. D. Kroenke., "Database Processing", Galgotia Publications.
4. Henry F. Korth, "Database System Concepts", McGraw Hill. Inc.
5. Naveen Prakash, "Introduction to Database Management", TMH

BCA-204: SOFTWARE ENGINEERING

4Credits: (4L)

Teaching Hours per week: 4 **Maximum Marks: 100**

Pass Marks: 35% **Internal Assessment: 30 marks**

External: 70 marks

A) INSTRUCTION FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective section of the syllabus carrying 10.5 marks for each question. Section C will consist of 5-10 short answer type questions carrying a total of 28 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

B) INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

SECTION – A

Introduction – The Problem Domain, Software Engg.Challenges, Software Engg.Approach. Software development life cycle, its phases**, Software development process models :**Waterfall, Prototyping, Iterative; **Software Process**- Characteristics of software process, Project management process, Software configuration management process.**Project Planning** – activities, COCOMO model.**Software Metrics** – Definition, Importance, Categories of metrics. **Software Quality** – Attributes,Cyclomatic complexity metric.

Software Requirements Analysis – Need for SRS, Data flow diagrams, Data Dictionary, entity relationship diagram, Characteristics and components of SRS, validation, metrics

SECTION-B

Software Design – Design principles, Module-level concepts, Structure Chart and Structured Design methodology,, verification, metrics : network metrics, information flow metrics.

Coding – Programming Principles and Guidelines, Verification- code inspections, static analysis.**Software Testing** – testing fundamentals, Black Box Testing : Equivalence class partitioning, Boundary value analysis, cause-effect graphing; White Box Testing : Control flow and Data flow based testing, mutation testing; levels of testing, test plan, test case specification, test case execution and analysis,**Software maintenance** – Categories of maintenance.**Software Reliability** – Definition, uses of reliability studies

Text Book:

1. An Integrated approach to Software Engineering, Third Edition 2005,PankajJalote, Narosa Publications.

References:

1. Software Engineering , Revised Second Edition , K.K. Aggarwal, Yogesh Singh, New Age International Publishers.
2. Software Engineering – A Practitioner's Approach, Fifth Edition, Roger. S. Pressman, McGraw Hill

BCA-205(E1): Basic Mathematics
6Credits: (5L + 1T)

Teaching Hours per week: 6 **Maximum Marks: 100**
Pass Marks: 35% **Internal Assessment: 30 marks**
External: 70 marks

A) INSTRUCTION FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective section of the syllabus carrying 10.5 marks for each question. Section C will consist of 5-10 short answer type questions carrying a total of 28 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

B) INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

SECTION A

Matrices: Types of Matrices, Addition, Subtraction, Multiplication, Transpose, Conjugate and their properties, Symmetric, Skew-symmetric, Minor, co-factors, Adjoint, Inverse of matrices, Solution of linear system of equations using matrices.

Determinants: Expansion of determinants ,solution of linear system of equations using Cramer rule.

Basic Number System: Floating point representation of numbers, arithmetic operation with normalised floating point numbers and its consequences, errors in numbers.

Solution of transcendental equations(without convergence): Bi-section method, Regula-falsi method, Newton/Raphson method, Secant method

Solution of simultaneous algebraic equations: Gauss elimination method, pivoting, ill-conditioned equations, Gauss-Seidel iterative method, comparison of direct and iterative method.

SECTION B

Complex Numbers: Complex Numbers in the form of a+ib, Real and Imaginary parts of a complex number, Complex conjugate, algebra of complex numbers, square roots of a complex number, cube roots of unity.

Quadratic Equations: Solutions of Quadratic equations (with real and complex coefficients), Relations between roots and coefficients, Nature of roots, Equations reducible to quadratic equations.

Cartesian System of Rectangular Coordinates: Cartesian coordinate system, distance formula, section formula, centroid and incentre, area of triangle, condition for collinearities of three points in a plane.

Reference Books:

1. NCERT Textbooks of Mathematics for +1 and +2.
2. M K. Jain, S.R.K. Iyengar and R.K. Jain," Numerical Methods for Scientific and Engineering Computation", Wiley.
3. B. S. Grewal, Higher Engineering Mathematics", Khanna Publishers.

BCA-205 (E2): Quantitative Aptitude
6 Credits: (5L+1T)

Teaching Hours per week: 6 **Maximum Marks: 100**
Pass Marks: 35% **Internal Assessment: 30 marks**
External: 70 marks

Instructions for Paper Setter/Examiners
The question paper will consist of two sections with multiple choice questions. Section A and B will have 25 multiple choice questions from each respective unit of the syllabus. Candidates are required to attempt all the questions.

Course Objectives:

1. This course provides the students with an understanding of deductive and inductive reasoning
2. To make students understand both Verbal and Non Verbal Reasoning.
3. To practice various quantitative aptitude question.

SECTION A

Verbal Reasoning: Number series, Letter & symbol series, Logical Reasoning problems, Alphabet test, Blood relations, Direction sense test, Input output, Coding-decoding, Number Ranking
Non-verbal Reasoning: Making series/analogy, Classification, Series test, Odd figures.

SECTION B

Quantitative aptitude: whole numbers problems, Problems on Trains, Numbers and Ages, Percentage Problems, Boats and Streams, Ratio & Proportion, Square roots, Averages, Interest, Heights and Distances, Time and distance, Series, Time & Work, Data Interpretation.

References:

1. R.S Aggarwal, "Quantitative aptitude".
2. R.S Aggarwal , "Verbal and non-verbal Reasoning".

BCA-206: Software Lab – V
(Based on Paper BCA-201)
2 Credits: 4H(P)

Practical Hours per week: 4 **Maximum Marks: 100**
Pass Marks: 35% **Internal Assessment: 30 marks**
External: 70 marks

This laboratory course will comprise of exercises to supplement what is learnt under paper BCA-201: Object Oriented Programming using C++.
The breakup of marks for the practical will be as under: -

i. Internal Assessment	30Marks
ii. Viva Voce(ExternalEvaluation)	40Marks
iii. Lab Record, Program Development and Execution(ExternalEvaluation)	30Marks

Students are required to develop the following programs in C++ language with internal documentation:

1. Write a program to find area of rectangle using the concept of classes & object.
2. Write a program to read 2 integers and perform simple arithmetic operations using pointer technique. (Use new and delete operators)
3. Write a program to show the use of friend function.
4. Write a program to show the use of constructor overloading.
5. Write a program to show the use of copy constructor.
6. Write a program to show the use of destructors.
7. Write a program to show the use of virtual function.
8. Write a program to implement the concept of multilevel inheritance.
9. Write a program to implement the concept of multiple inheritance.
10. Write a program of unary operator overloading.
11. Write a program of Binary operator overloading.
12. Develop an Object Oriented program in C++ to read emp name, emp code, designation, experience and age. Construct the database with suitable member functions for initializing and destroying the data using constructor and destructor and dynamic memory allocation operators new and delete.
13. Write a program in C++ to prepare mark sheet of an University exam by reading stuname, rollno, subname, subcode, internal marks, external marks. Design a base class consisting data members such as student name, roll no, sub name. Derived class consists data members such as sub code, internal marks, external marks, construct oops data to search for a record i.e. be printed.

BCA-207: Software Lab – VI
(Based on Paper BCA- 202)
2 Credits: 4H(P)

Practical Hours per week: 4 **Maximum Marks: 100**
Pass Marks: 35% **Internal Assessment: 30 marks**
External: 70 marks

This laboratory course will comprise of exercises to supplement what is learnt under paper BCA-202: Data Structure.
The breakup of marks for the practical will be as under: -

i. Internal Assessment	30Marks
ii. Viva Voce(ExternalEvaluation)	40Marks
iii. Lab Record, Program Development and Execution(ExternalEvaluation)	30Marks

Students are required to develop the following programs in C++ language with internal documentation:

1. Program to insert and delete an element from an array.
2. Write a program to find largest and smallest elements in an array.
3. Write a program using to add and subtract two matrices.
4. Write a program using to Multiply and Transpose two matrices.
5. Program to apply various operations on stack.
6. Program for parenthesis matching using stack.
7. Program for String reversal using stack.
8. Program to insert and delete nodes in a queue.
9. Program to insert and delete nodes in a linked list.
10. Program to search a node in a linked list.
11. Program to insert or delete node in a binary tree.
12. Program to traverse binary tree.
13. Write a program using ADT to perform linear search.
14. Write a program using ADT to perform binary search.
15. Write a program in C++ to implement Bubble sort and Selection Sort
16. Write a program in C++ to implement Quick Sort.
17. Program for implementing Insertion sort.
18. Program for implementing Merge sort.

BCA-208: Software Lab – VII
(Based on Paper BCA-203: Relational Database Management System)
2 Credits: 4H (P)

Practical Hours per week: 4 **Maximum Marks: 100**
Pass Marks: 35% **Internal Assessment: 30marks**
External: 70 marks

This laboratory course will comprise of exercises to supplement what is learnt under paper BCA-203 (Relational Database Management System).
The breakup of marks for the practical will be as under: -

i.	Internal Assessment	30Marks
ii.	Viva Voce(ExternalEvaluation)	40Marks
iii.	Lab Record, Program Development and Execution(ExternalEvaluation)	30Marks

This laboratory course will comprise of exercises to supplement what is learnt under paper BCA-203: Relational Database Management System.

Students are required to practices writing SQL statements for:

1. Creating the Table
2. Querying the record using order by clause
3. Querying the record using group by clause
4. Querying the record using multiple conditions
5. Create Synonyms
6. Create Sequences
7. Create Views
8. Create Indexes
9. Create triggers
10. Create cursors for procedures

ਬੀ.ਸੀ.ਏ. ਭਾਗ ਦੂਜਾ ,ਸਮੈਸਟਰ ਤੀਜਾ

ਪੇਪਰ- ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ

ਪੇਪਰ ਕੋਡ:**PBCA-301A**,ਕ੍ਰੈਡਿਟ-02

2020-21,2021-22,2022-23 ਸੈਸ਼ਨ ਲਈ

ਕੁੱਲ ਅੰਕ :50 ਵਿਸ਼ੇ ਵਿਚੋਂ ਪਾਸ ਅੰਕ :17

ਬਾਹਰੀ ਪਰੀਖਿਆ:35 ਅੰਕ ਬਾਹਰੀ ਪਰੀਖਿਆ ਵਿਚੋਂ ਪਾਸ ਅੰਕ:12

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ :15 ਅੰਕ ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ ਵਿਚੋਂ ਪਾਸ ਅੰਕ:05

ਸਮਾਂ:3 ਘੰਟੇ ਕੁੱਲ ਲੈਕਚਰ:30

ਪਾਠਕ੍ਰਮ ਦਾ ਉਦੇਸ਼:

1.ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਸਾਹਿਤ ਪੜ੍ਹਨ ਦੀ ਰੁਚੀ ਪੈਦਾ ਕਰਨਾ।

2.ਮਾਤ ਭਾਸ਼ਾ ਵਿੱਚ ਉਚੇਰੀ ਸਿੱਖਿਆ ਗ੍ਰਹਿਣ ਕਰਨ ਦੀ ਜਾਗ ਲਾਉਣਾ।

3.ਵਿਆਕਰਨਕ ਪੱਖਾਂ ਨਾਲ ਰਾਬਤਾ ਕਾਇਮ ਕਰਵਾਉਣਾ।

4.ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਨੈਤਿਕ ਕਦਰਾਂ-ਕੀਮਤਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਦੇਣਾ।

ਪੇਪਰ ਸੈੱਟਰ ਅਤੇ ਵਿਦਿਆਰਥੀਆਂ ਲਈ ਹਦਾਇਤਾਂ

1.ਭਾਗ-ਓ ਵਿਚੋਂ ਕਹਾਣੀ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ/ ਸਾਰ (ਤਿੰਨ ਵਿਚੋਂ ਇੱਕ)08 ਅੰਕ

2.ਭਾਗ ਓ ਵਿਚੋਂ ਪਾਤਰ-ਚਿਤਰਨ (ਤਿੰਨ ਵਿਚੋਂ ਇੱਕ)04 ਅੰਕ

3.ਭਾਗ ਅ-1 ਵਿੱਚ ਦਿੱਤੇ ਪੈਰ੍ਹੇ ਦਾ ਸਿਰਲੇਖ ਦੱਸ ਕੇ ਸੰਖੇਪ ਰਚਨਾ (ਦੋ ਵਿਚੋਂ ਇੱਕ) 2+3 ਅੰਕ

4.ਭਾਗ-ਅ ਵਿਚੋਂ ਵਿਆਕਰਨ ਨਾਲ ਸੰਬੰਧਿਤ ਵਰਣਾਤਮਕ ਪ੍ਰਸ਼ਨ (ਦੋ ਵਿਚੋਂ ਇੱਕ) 08 ਅੰਕ

5.ਭਾਗ-ਏ ਵਿਚ ਕਹਾਣੀਆਂ ਅਤੇ ਵਿਆਕਰਨ ਵਿੱਚੋਂ ਕੁੱਲ 10(6+4) ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ ਲਾਜ਼ਮੀ ਪ੍ਰਸ਼ਨ।ਵਿਦਿਆਰਥੀਆਂ ਲਈ ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਜ਼ਰੂਰੀ ਹਨ । ਹਰੇਕ ਪ੍ਰਸ਼ਨ01 ਅੰਕ ਦਾ ਹੋਵੇਗਾ। **10X1=10** ਅੰਕ

ਪਾਠਕ੍ਰਮ ਅਤੇ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੀ ਰੂਪ-ਰੇਖਾ

ਭਾਗ-ਓ

ਓ - ਕਥਾ ਰੰਗ(ਕਹਾਣੀ-ਸੰਗ੍ਰਹਿ) ਸੰਪਾ.ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ ਅਤੇ ਡਾ.ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ,ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ।

ਭਾਗ-ਅ

ਅ -1.ਸੰਖੇਪ ਰਚਨਾ

ਅ-2. ਵਿਆਕਰਨ

(i) ਵਾਕ:ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ

(ii) ਉਪਵਾਕ:ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ

ਭਾਗ-ਏ

ਕਹਾਣੀਆਂ ਅਤੇ ਵਿਆਕਰਨ ਵਾਲੇ ਭਾਗ ਵਿਚੋਂ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ ਪ੍ਰਸ਼ਨ

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1. ਜੋਗਿੰਦਰ ਸਿੰਘ ਰਾਹੀ,ਮਸਲੇ ਗਲਪ ਦੇ,ਨਾਨਕ ਸਿੰਘ ਪੁਸਤਕਮਾਲਾ,ਅੰਮ੍ਰਿਤਸਰ,1992

2. ਬਲਦੇਵ ਸਿੰਘ ਧਾਲੀਵਾਲ,ਪੰਜਾਬੀ ਕਹਾਣੀ ਦਾ ਇਤਿਹਾਸ,ਪੰਜਾਬੀ ਅਕਾਦਮੀ,ਦਿੱਲੀ

3. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਸ੍ਰੋਤ ਤੇ ਸਰੂਪ,ਵਾਰਿਸ ਸ਼ਾਹ ਫਾਂਊਡੇਸ਼ਨ ਅੰਮ੍ਰਿਤਸਰ,2012

4.ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ ਸਿਧਾਂਤ ਅਤੇ ਵਿਹਾਰ,ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ ,ਲੁਧਿਆਣਾ,2008

5.ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ ਤੇ ਭਾਸ਼ਾ ਵਿਗਿਆਨ,ਤਕਨੀਕੀ ਸ਼ਬਦਾਵਲੀ ਦਾ ਵਿਸ਼ਾ ਕੋਸ਼,

ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ,2009
6.ਡਾ. ਜਗਜੀਤ ਸਿੰਘ,ਪੰਜਾਬੀ ਵਿਆਕਰਨ:ਸ਼੍ਰੇਣੀਆ ਅਤੇ ਇਕਾਈਆ,ਨਿਊ ਬੁੱਕ ਕੰਪਨੀ,ਚੰਡੀਗੜ੍ਹ।
7.ਡਾ.ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ ਅਤੇ ਹੋਰ,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨ ਭਾਗ **II**,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ,ਜਲੰਧਰ,1991
8.ਗਿਆਨੀ ਲਾਲ ਸਿੰਘ ਤੇ ਹਰਕੀਰਤ ਸਿੰਘ ,ਕਾਲਜ ਪੰਜਾਬੀ ਵਿਆਕਰਣ ,ਪੰਜਾਬ ਸਟੇਟ ਯੂਨੀ.ਟੈਕਸਟ ਬੁੱਕ ਬੋਰਡ,ਚੰਡੀਗੜ੍ਹ
9. ਸੰਤ ਸਿੰਘ ਸੇਖੋਂ,ਸਾਹਿਤਆਰਥ,ਲਾਹੌਰ ਬੁੱਕ ਸ਼ਾਪ,ਲੁਧਿਆਣਾ

ਬੀ.ਸੀ.ਏ. ਭਾਗ ਦੂਜਾ ,ਸਮੈਸਟਰ ਤੀਜਾ

ਪੇਪਰ- ਪੰਜਾਬੀ ਮੁੱਢਲਾ ਗਿਆਨ

ਪੇਪਰ ਕੋਡ:**PBCA-301B**,ਕ੍ਰੈਡਿਟ-02

2020-21,2021-22,2022-23ਸੈਸ਼ਨ ਲਈ

ਕੁੱਲ ਅੰਕ :50 ਵਿਸ਼ੇ ਵਿਚੋਂ ਪਾਸ ਅੰਕ : 17

ਬਾਹਰੀ ਪਰੀਖਿਆ:35 ਅੰਕ ਬਾਹਰੀ ਪਰੀਖਿਆ ਵਿਚੋਂ ਪਾਸ ਅੰਕ: 12

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ :15 ਅੰਕ ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ ਵਿਚੋਂ ਪਾਸ ਅੰਕ:05

ਸਮਾਂ:3 ਘੰਟੇ ਕੁੱਲ ਲੈਕਚਰ:30

ਪਾਠਕ੍ਰਮ ਦਾ ਉਦੇਸ਼:

1.ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸਾਹਿਤ ਪੜ੍ਹਨ ਲਈ ਪ੍ਰੇਰਿਤ ਕਰਨਾ।

2.ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਜਾਣਕਾਰੀ ਦੇਣਾ।

3.ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸਹਿਤ ਸਿਰਜਣ ਲਈ ਪ੍ਰੇਰਿਤ ਕਰਨਾ।

4.ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸਭਿਆਚਾਰ,ਲੋਕਧਾਰਾ ਅਤੇ ਨੈਤਿਕ ਕਦਰਾਂ -ਕੀਮਤਾਂ ਤੋਂ ਜਾਣੂ ਕਰਵਾਉਣਾ।

ਪੇਪਰ ਸੈੱਟਰ ਅਤੇ ਵਿਦਿਆਰਥੀਆਂ ਲਈ ਹਦਾਇਤਾਂ:

1.ਸਾਰਾ ਸਿਲੇਬਸ 'ਅੱਖਰ ਗਿਆਨ (ਭਾਗ-ਦੂਜਾ)'ਵਿਚੋਂ ਹੀ ਪਾਇਆ ਜਾਵੇ।

2.ਭਾਗ-ਓ: ਵਿਚ ਨਿਬੰਧ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ /ਸਾਰ (ਤਿੰਨ ਵਿਚੋਂ ਇੱਕ)07 ਅੰਕ

3.ਭਾਗ-ਅ:1 ਵਿਚ ਅਨੁਵਾਦ ਅੰਗਰੇਜ਼ੀ ਸ਼ਬਦਾਂ ਤੋਂ ਪੰਜਾਬੀ ਸ਼ਬਦਾਂ ਵਿਚ (ਸੋਲਾਂ ਵਿਚੋਂ ਅੱਠ) 04 ਅੰਕ

4.ਭਾਗ-ਅ:2 ਵਿਚ ਸ਼ਬਦ ਜੋੜਾਂ ਦੀ ਸੁਧਾਈ (ਸੋਲਾਂ ਵਿਚੋਂ ਅੱਠ) 04 ਅੰਕ

5.ਭਾਗ-ਅ:3 ਵਿਚ ਵਿਆਕਰਨ ਨਾਲ ਸੰਬੰਧਿਤ ਪ੍ਰਸ਼ਨ (ਦੋ ਵਿਚੋਂ ਇੱਕ) 05 ਅੰਕ

6.ਭਾਗ-ਏ ਵਿਚ ਨਿਬੰਧਾਂ,ਅਨੁਵਾਦ ਅਤੇ ਸ਼ਬਦਾਂ ਦੀ ਸੁਧਾਈ ਵਿਚੋਂ ਕੁੱਲ 15 ਆਬਜੈਕਟਿਵ ਪ੍ਰਸ਼ਨ ।ਵਿਦਿਆਰਥੀਆਂ ਲਈ ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹਨ । ਹਰੇਕ ਪ੍ਰਸ਼ਨ 01 ਅੰਕ ਦਾ ਹੋਵੇਗਾ । (**15X1=15** ਅੰਕ)

ਪਾਠਕ੍ਰਮ ਅਤੇ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੀ ਰੂਪ-ਰੇਖਾ

ਭਾਗ-ਓ

ਓ -ਅੱਖਰ ਗਿਆਨ(ਭਾਗ-ਦੂਜਾ),ਮੁੱਖ ਸੰਪਾ. ਡਾ.ਜਸਵੀਰ ਸਿੰਘ,ਸੰਪਾ.ਡਾ.ਅਵਤਾਰ ਸਿੰਘ,ਡਾ.ਗੁਰਪ੍ਰੀਤ ਕੌਰ, ਪ੍ਰੋ.ਸੁਖਵਿੰਦਰ ਸਿੰਘ,ਸ੍ਰੀ ਗੁਰੂ ਤੇਗ਼ ਬਹਾਦਰ ਖ਼ਾਲਸਾ ਕਾਲਜ,ਸ੍ਰੀ ਅਨੰਦਪੁਰ ਸਾਹਿਬ,ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ,ਪੁਸਤਕ ਵਿੱਚੋਂ ਨਿਬੰਧ ਵਾਲਾ ਭਾਗ

ਭਾਗ-ਅ

ਅ-1.ਅਨੁਵਾਦ(ਅੰਗਰੇਜ਼ੀ ਸ਼ਬਦਾਂ ਤੋਂ ਪੰਜਾਬੀ ਸ਼ਬਦਾਂ ਵਿਚ)

ਅ-2 .ਸ਼ਬਦ ਜੋੜਾਂ ਦੀ ਸੁਧਾਈ।

ਅ-3 .ਵਿਸ਼ੇਸ਼ਣ ਅਤੇ ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ :ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਕਿਸਮਾਂ

ਭਾਗ-ਏ

ਨਿਬੰਧਾਂ,ਅਨੁਵਾਦ ਅਤੇ ਸ਼ਬਦਾਂ ਦੀ ਸੁਧਾਈ ਵਿਚੋਂ ਸਿਲੇਬਸ ਵਿਚੋਂ ਆਬਜੈਕਟਿਵ ਪ੍ਰਸ਼ਨ

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1. ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ ਤੇ ਭਾਸ਼ਾ ਵਿਗਿਆਨ,ਤਕਨੀਕੀ ਸ਼ਬਦਾਵਲੀ ਦਾ ਵਿਸ਼ਾ ਕੋਸ਼, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ,2009
2. ਡਾ.ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ ਅਤੇ ਹੋਰ,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨ ਭਾਗ **I**,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ,ਜਲੰਧਰ,1991
3. ਡਾ.ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ ਅਤੇ ਹੋਰ,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨ ਭਾਗ **II**,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ,ਜਲੰਧਰ,1991

4.ਬਲਵੀਰ ਸਿੰਘ ਦਿਲ, ਪੰਜਾਬੀ ਨਿਬੰਧ :ਸਰੂਪ, ਸਿਧਾਂਤ ਅਤੇ ਵਿਕਾਸ,ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ,ਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ।

5.ਖੋਜ ਪੱਤ੍ਰਿਕਾ, ਨਿਬੰਧ ਅੰਕ-29,ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ,ਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ।

APPROVED

SEMESTER - IV

BCA-211: COMPUTER NETWORKS

6Credits: (5L + 1T)

Teaching Hours per week: 6 **Maximum Marks: 100**

Pass Marks: 35% **Internal Assessment: 30 marks**

External: 70 marks

A) INSTRUCTION FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective section of the syllabus carrying 10.5 marks for each question. Section C will consist of 5-10 short answer type questions carrying a total of 28 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

B) INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

SECTION-A

Introduction to Computer networks, Applications, Network hardware and Software (protocol hierarchies, design issues for layers, interfaces and services: connection oriented and connection less), Network structure and architecture- point to point, multicast, broadcast, Classification of networks- LAN, MAN and WAN. Reference models, the OSI reference model, TCP / IP reference model. Comparison between OSI and TCP / IP models.LAN Protocols : CSMA, CSMA/CD, Collision Free protocol, BRAP, MLMA, Binary countdown. Data Link Layer: Design issues, Services to network layer, Framing, Error control, Flow control.

SECTION-B

Network layer: Design issues, Services to the transport layer, Routing algorithms- Static/ non-adaptive and dynamic/adaptive algorithms. Congestion control algorithms – the leaky bucket algorithm, the token bucket algorithm.

Transport layer protocols- TCP, UDP.

Application layer: The DNS Name Space, Electronic Mail, The World Wide Web, Network security: Introduction to cryptography, substitution ciphers, transposition ciphers, one-time pads, two fundamental cryptographic principles, public-key algorithms (RSA, other Public-key algorithms), digital signatures.

Text Book:

1. B Forouzan, Introduction to data communication and networking

Reference Books:

1. A S Tanenbaum, Computer Networks.

BCA-212: PROGRAMMING USING JAVA

4Credits: (4L)

Teaching Hours per week: 4 **Maximum Marks: 100**

Pass Marks: 35% **Internal Assessment: 30 marks**

External: 70 marks

A) INSTRUCTION FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective section of the syllabus carrying 10.5 marks for each question. Section C will consist of 5-10 short answer type questions carrying a total of 28 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

B) INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

SECTION-A

Introduction to java: evolution, features, comparison with C and C++; Java program structure; tokens, keywords, constants, variables, data types, type casting, statements.**Operators and expressions:** arithmetic, relational, logical, assignment, increment, decrement, conditional, bitwise and special operators. Operator precedence & associativity rules.**Control statements:** if else, switch case, for, while, do while, break, continue, labeled loops.**Class:** syntax, instance variable, class variables, methods, constructors, overloading of constructors and methods.

SECTION B

Inheritance: types of inheritance, use of super, method overriding, final class, abstract class, wrapper classes.Arrays, Strings and Vectors, Packages and Interfaces, visibility controls.**Errors and Exceptions:** Types of errors, Exception classes, Exception handling in java, use of try, catch, finally, throw and throws. Taking user input, Command line arguments.0**Multithreaded Programming:** Creating Threads, Life cycle of thread, Thread priority, Thread synchronization, Inter-thread communication.

Text Book:

1. Patrick Naughton and Herbert Schildt, "*The Complete Reference Java 2*", TMH

References:

2. Horstmann, Cay S. and Gary Cornell, "*Core Java 2: Fundamentals Vol. 1*", Pearson Education.
3. E. Balagurusamy "*Programming with Java*", TMH

BCA-213: System Software
6Credits: (5L+1T)

Teaching Hours per week: 6 **Maximum Marks: 100**
Pass Marks: 35% **Internal Assessment: 30 marks**
External: 70 marks

A) INSTRUCTION FOR THE PAPER SETTER
The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective section of the syllabus carrying 10.5 marks for each question. Section C will consist of 5-10 short answer type questions carrying a total of 28 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

B) INSTRUCTIONS FOR THE CANDIDATES
Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

SECTION-A

Introduction to System Software: Introduction to System Software and its components.Translators, loaders, interpreters, compiler, assemblers.
Assemblers: Overview of assembly process, design of one pass and two assemblers
Macroprocessors: Macro definition and expansion, concatenation of macro parameters, generations of unique labels, conditional macro expansion, Recursive macro expansion

SECTION-A
Compilers: Phases of Compilation Process, Lexical Analysis, Parsing, Storage Management Optimization, Incremental Compilers, Cross Compilers.
Loaders and Linkage editors: Basic loader functions. Relocation, program linking, linkage, editors, dynamic linking, Bootstrap loaders.

References:
1. Leland L. Beck: System Software, An Introduction to System Programming, Addison Wesley.
2. D.M. Dhamdhere: Introduction to System Software, Tata McGraw Hill.
3. D.M. Dhamdhere: System Software and Operating System, Tata McGraw Hill, 1992.
4. Madrich, Stuarte: Operating Systems, McGraw Hill, 1974.
5. Stern Nancy Assembler Language Programming for IBM and IBM Compatible Computers, John Wiley, 1991.

BCA-214: Workshop on Adobe Photoshop
4 Credits: (4P)

Practical Hours per week: 4 **Maximum Marks: 100**
External :50 Marks
Pass Marks: 35% **Internal Assessment: 50 marks**

Introduction to Photoshop: Basics of Adobe Photoshop. Understanding pixels & resolution.Exploring menus, panels and toolbox. Creating new image files and opening existing files in Photoshop. Understanding and handling different image file formats, changing the resolution, color, greyscales and size of the images. Zooming & panning an image. Working with multiple images, rulers, guides & grids. Creating multicolor images and using brushes, adjusting color using the panel. Cropping, rotating, overlapping and superimposingphotos on a page. Undoing Steps with History

Working with selections, layers and channels: Understanding selection tools, refining the selection and edges. Understanding layers, creating, selecting, editing, locking and grouping layers.Layer styles, consolidating layers.Manipulating layer mask. Understanding color channels, working with channels panel.

Working with filters: Basics of Filters, constructive filters, blur filters, destructive filters, effects filters, render filters, liquify filter and other filters required for artistic effects.

Creating images for the web: understanding web image formats, preparing and slicing images for the web use.Adding transparency to the web, previewing images in a browser.

References:

1. Adobe Photoshop CS6, Bible the comprehensive, tutorial resource – Lisa DanaeDayley, Brad Dayley - WileyIndia
2. Photoshop 7 Savvy – Steve Romaniello – BPBPublications.

BCA-215(E1): DIGITAL ELECTRONICS

6Credits: (5L + 1T)

Teaching Hours per week: 6 **Maximum Marks: 100**

Pass Marks: 35% **Internal Assessment: 30 marks**

External: 70 marks

A) INSTRUCTION FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective section of the syllabus carrying 10.5 marks for each question. Section C will consist of 5-10 short answer type questions carrying a total of 28 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

B) INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

SECTION A

Fundamental Concepts: Introduction to Analog and Digital Systems, Digital Signals, Characteristics of Digital IC Basic, Logic gates: AND, OR, NOT, NAND, NOR, XOR and XNOR gates. Number Systems: Positional and Non-positional number systems, Binary, Decimal, Octal and Hexa decimal, Base conversions. Binary Arithmetic: Addition, Multiplication, Division and Subtraction using 1's complement, 2's complement method. Boolean Algebra and Minimization techniques: Simplification of Boolean expressions using Laws, Rules, Duality Principal and Demorgan's Theorems. Canonical SOP and POS Representation of Logic functions, K-Map representation and simplification upto 4 variable expressions, Don't care condition.

SECTION B

Adders and Subtractors: Design of Half adder, Full adder and Binary adder, Design of Half Subtractor and Full Subtractor. Multiplexer and De-multiplexers: Design of Multiplexer (4X1,8X1 and16X1), Design of Demultiplexers (1 to4, 1 to8 and 1to16). Decoders and Encoders: 2X4,3X8, 4X16, BCD to Decimal decoder, BCD to 7 Segment decoder. Encoders:8X3, Decimal to BCD encoder.Parity generator and Parity checker. Flip-Flops: Introduction, Latch, Clocked S-R Flip Flop, Preset and Clear signals, D-Flip Flop, J-K Flip Flop, race-around condition, Master Slave J-K Flip Flop, D-Flip-Flop, Edge Triggered Flip Flops.

Reference Books:

1. NCERT Textbooks of Mathematics for +1 and +2.
2. M K. Jain, S.R.K. Iyengar and R.K. Jain," Numerical Methods for Scientific and Engineering Computation", Wiley.
3. B. S. Grewal, Higher Engineering Mathematics", Khanna Publishers.

BCA-215 (E2): Computer Oriented Statistical Methods
6 Credits: (5L+1T)

Teaching Hours per week: 6 **Maximum Marks: 100**
Pass Marks: 35% **Internal Assessment: 30 marks**
External: 70 marks

A) INSTRUCTION FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective section of the syllabus carrying 10.5 marks for each question. Section C will consist of 5-10 short answer type questions carrying a total of 28 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

B) INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all by selecting at least two questions each from the section A and B. Section C is compulsory.

SECTION-A

Introduction: Meaning and Definitions of Statistics, Data and Data Sources, Types of Statistics, Importance of Statistics in computers, an overview of central tendency, Arithmetic Mean, Median, Mode, Relationships of the Mean, Median and Mode.

Dispersion: Meaning and Definition of Dispersion, Significance and Properties of Measuring Variation, Measures of Dispersion, Range, Interquartile Range or Quartile Deviation, Mean Deviation, Standard Deviation.

Correlation Analysis: Definition, Scatter diagram, Correlation Graph, Pearson's Coefficient of Correlation, Spearman's Rank Correlation, Limitations of Correlation Analysis.

Regression: Linear Regression, Regression Line of Y on X: Scatter Diagram, Fitting a Straight Line, Regression Line of X on Y, Properties of Regression Coefficients, Regression Lines and Coefficient of Correlation, Correlation Analysis Versus Regression Analysis.

SECTION-B

Computer Arithmetic :Basics of Floating point representation of numbers, arithmetic operation with normalised floating point numbers and its consequences, errors in numbers, binary representation of numbers.

Iterative Methods for finding roots :Bisection, False Position, Regula-falsi method, Secant Method, Newton Raphson, Discuss convergence only without derivation.

Solution of simultaneous algebraic equations: Gauss elimination method, Gauss-Seidel iterative method, Jacobi's Method, Gauss Jordan Method.

Text Books:

1. V. Rajaraman, "Computer Oriented Numerical Methods", PHI, New Delhi, 1994
2. Murray R Spiegel, Larry J. Stephens - "Statistics" Schaum's Outlines

Reference Books:

1. J.H. Mathews," Numerical Methods for Computer Science, Engineering and Mathematics", PHI,
2. M K. Jain, S.R.K. Iyengar and R.K. Jain," Numerical Methods for Scientific and Enginerring Computation", Wiley Eastern Limited, New Delhi,
3. S.C. Chopra and R.P.C Anale,"Numarical Methods for Engineers", McGraw-Hill, New York

BCA-216: SOFTWARE LAB-VIII
(Based on Paper BCA-212)
2 Credits: (4P)

Practical Hours per week: 4 **Maximum Marks: 100**
Pass Marks: 35% **Internal Assessment: 30 marks**
External: 70 marks

This laboratory course will comprise of exercises to supplement what is learnt under paper BCA-212 (Programming using Java).
The breakup of marks for the practical will be as under: -

i. Internal Assessment30Marks
ii. Viva Voce(ExternalEvaluation) 40Marks
iii. Lab Record, Program Development and Execution(ExternalEvaluation)30Marks

Students are required to develop the following programs in Java language with internal documentation:

1. Write a ***Class Date*** that takes day, month, and year while creating an object of this class. Find a new date when the number of days is given.
2. Write a program to implement Boolean AND, OR, XOR, and NOT operations.
3. Write a program to Add, Subtract, Multiply two matrices using switch statement. The program must also validate the sizes of two matrices before performing any operation and should raise exception in case the operation cannot be performed.
4. Write a program to store and then prints sorted names of students according to their length of name using arrays with variable sized rows.
5. Write a program to find the ***area of all types of triangles*** using the principle of ***constructor overloading and Inheritance*** depending on the number of dimensions given in the input parameter list using ***super*** to call the super class constructor.
6. Write a program to find the ***area of rectangle*** using an ***abstract super*** class figure and also ***override*** method use to compute the area of the rectangle.
7. Write a program to implement grow able and shrinkable ***Stack*** that can support operations like-push, pop, and view the top item with concept of dynamic allocation using ***finalize()*** method. The program should also incorporate the concepts of ***private and public*** access methods to avoid accidental manipulations of stack.
8. Write a program to demonstrate ***static variables, methods and blocks***.
9. Write a program to swap two items belonging to an object using ***returning of object*** by a function.
10. Write a program to count the frequency of each vowel in a given string.
11. Demonstrate the use of ***static and non static nested*** classes.
12. Create a package containing a class to print your (name, roll no, marks) and use this package in another program using ***import*** statement.

ਬੀ.ਸੀ.ਏ ਭਾਗ ਦੂਜਾ ,ਸਮੈਸਟਰ ਚੌਥਾ

ਪੇਪਰ–ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ

ਪੇਪਰ ਕੋਡ:**PBCA-401A**,ਕ੍ਰੈਡਿਟ–02

2020-21,2021-22,2022-23 ਸੈਸ਼ਨ ਲਈ

ਕੁੱਲ ਅੰਕ :50 ਵਿਸ਼ੇ ਵਿਚੋਂ ਪਾਸ ਅੰਕ : 17

ਬਾਹਰੀ ਪਰੀਖਿਆ:35 ਅੰਕ ਬਾਹਰੀ ਪਰੀਖਿਆ ਵਿਚੋਂ ਪਾਸ ਅੰਕ: 12

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ :15 ਅੰਕ ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ ਵਿਚੋਂ ਪਾਸ ਅੰਕ:05

ਸਮਾਂ:3 ਘੰਟੇ ਕੁੱਲ ਲੈਕਚਰ:30

ਪਾਠਕ੍ਰਮ ਦਾ ਉਦੇਸ਼:

1.ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਸਾਹਿਤ ਪੜ੍ਹਨ ਦੀ ਰੁਚੀ ਪੈਦਾ ਕਰਨਾ।

2.ਮਾਤ ਭਾਸ਼ਾ ਵਿੱਚ ਉਚੇਰੀ ਸਿੱਖਿਆ ਗ੍ਰਹਿਣ ਕਰਨ ਦੀ ਜਾਗ ਲਾਉਣਾ।

3.ਵਿਆਕਰਨਕ ਪੱਖਾਂ ਨਾਲ ਰਾਬਤਾ ਕਾਇਮ ਕਰਵਾਉਣਾ।

4.ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਨੈਤਿਕ ਕਦਰਾਂ–ਕੀਮਤਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਦੇਣਾ।

ਪੇਪਰ ਸੈੱਟਰ ਅਤੇ ਵਿਦਿਆਰਥੀਆਂ ਲਈ ਹਦਾਇਤਾਂ

1.ਭਾਗ–ਓ ਵਿਚੋਂ ਲੇਖਕ ਦਾ ਯੋਗਦਾਨ (ਦੋ ਵਿਚੋਂ ਇੱਕ)08ਅੰਕ

2. ਭਾਗ–ਓ ਵਿਚੋਂ ਕਵਿਤਾਵਾਂ ਦਾ ਵਿਸ਼ਾ–ਵਸਤੂ (ਤਿੰਨ ਵਿਚੋਂ ਇੱਕ)04 ਅੰਕ

3.ਭਾਗ ਅ–1 ਵਿਚੋਂ ਅਖ਼ਬਾਰੀ ਰਿਪੋਰਟ (ਤਿੰਨ ਵਿਚੋਂ ਇੱਕ)05 ਅੰਕ

4.ਭਾਗ–ਅ ਵਿਚੋਂ ਵਿਆਕਰਨ ਨਾਲ ਸੰਬੰਧਿਤ ਵਰਣਾਤਮਕ ਪ੍ਰਸ਼ਨ (ਦੋ ਵਿਚੋਂ ਇੱਕ) 08ਅੰਕ

5. ਭਾਗ–ਏ ਵਿਚ ਕਵਿਤਾਵਾਂ ਅਤੇ ਵਿਆਕਰਨ ਵਿੱਚੋਂ ਕੁੱਲ 10(6+4) ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ ਲਾਜ਼ਮੀ ਪ੍ਰਸ਼ਨ।ਵਿਦਿਆਰਥੀਆਂ ਲਈ ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਜ਼ਰੂਰੀ ਹਨ । ਹਰੇਕ ਪ੍ਰਸ਼ਨ 01 ਅੰਕ ਦਾ ਹੋਵੇਗਾ ।

10X1=10ਅੰਕ

ਪਾਠਕ੍ਰਮ ਅਤੇ ਪ੍ਰਸ਼ਨ–ਪੱਤਰ ਦੀ ਰੂਪ–ਰੇਖਾ

ਭਾਗ–ਓ

ਓ –ਪੰਜਾਬੀ ਕਾਵਿ–ਸੰਗ੍ਰਹਿ(1700 ਈ.ਤੱਕ),ਸੰਪਾ.ਡਾ.ਜਸਵਿੰਦਰ ਸਿੰਘ,ਡਾ.ਮਾਨ ਸਿੰਘ ਢੀਂਡਸਾ ਅਤੇ ਡਾ.ਗੁਰਸ਼ਰਨ ਕੌਰ ਜੱਗੀ,ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ,ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ ਪੁਸਤਕ ਵਿੱਚੋਂ ਸ਼ੇਖ ਫ਼ਰੀਦ(ਖੈਰੁ ਦੀਜੈ ਬੰਦਗੀ),ਹੀਰ ਦਮੋਦਰ(ਹੀਰ ਅਤੇ ਧੀਦੋ ਰਾਂਝੇ ਦਾ ਜਨਮ ਅਤੇ ਬਾਲ ਵਰੇਸ),ਕਾਫ਼ੀਆਂ ਸ਼ਾਹ ਹੁਸੈਨ(ਰੱਬਾ ਮੇਰੇ ਹਾਲ ਦਾ ਮਹਿਰਮ ਤੂੰ ਅਤੇ ਦਿਲ ਦਰਦਾਂ ਕੀਤੀ ਪੂਰੀ),ਗੁਰੂ ਤੇਗ਼ ਬਹਾਦਰ(ਸਾਧੋ ਰਚਨਾ ਰਾਮ ਬਨਾਈ),ਗੁਰੂ ਗੋਬਿੰਦ ਸਿੰਘ(ਮਿਤ੍ਰ ਪਿਆਰੇ ਨੂੰ) ਕਵਿਤਾਵਾਂ

ਭਾਗ–ਅ

ਅ-1.ਅਖ਼ਬਾਰੀ ਰਿਪੋਰਟ

ਅ–2. ਵਿਆਕਰਨ:

i.ਗੁਰਮੁਖੀ ਲਿਪੀ ਦਾ ਇਤਿਹਾਸ

ii.ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ

ਭਾਗ–ਏ

ਭਾਗ–ਓ ਅਤੇ ਵਿਆਕਰਨ ਵਾਲੇ ਭਾਗ ਵਿਚੋਂ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ ਪ੍ਰਸ਼ਨ

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1.ਪੰਜਾਬੀ ਦੁਨੀਆ,ਗੁਰੂ ਨਾਨਕ ਅੰਕ, ਭਾਸ਼ਾ ਵਿਭਾਗ ਪੰਜਾਬ, ਪਟਿਆਲਾ।

2. ਡਾ.ਤਾਰਨ ਸਿੰਘ ,ਬਾਬਾ ਫਰੀਦ: ਜੀਵਨ ਤੇ ਰਚਨਾ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ।

3. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਸ੍ਰੋਤ ਤੇ ਸਰੂਪ,ਵਾਰਿਸ਼ ਸ਼ਾਹ ਫਾਂਊਡੇਸ਼ਨ ਅੰਮ੍ਰਿਤਸਰ,2012

4. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ ਸਿਧਾਂਤ ਅਤੇ ਵਿਹਾਰ,ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ ,ਲੁਧਿਆਣਾ,2008

5. ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ ਤੇ ਭਾਸ਼ਾ ਵਿਗਿਆਨ,ਤਕਨੀਕੀ ਸ਼ਬਦਾਵਲੀ ਦਾ ਵਿਸ਼ਾ ਕੋਸ਼,ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ,2009

APPROVED

6.ਡਾ.ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ ਅਤੇ ਹੋਰ,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨਕ ਭਾਗ **I**,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ,ਜਲੰਧਰ,1991
7.ਡਾ.ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ ਅਤੇ ਹੋਰ,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨਕ ਭਾਗ **II**,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ,ਜਲੰਧਰ,1991
8.ਗਿਆਨੀ ਲਾਲ ਸਿੰਘ ਤੇ ਹਰਕੀਰਤ ਸਿੰਘ ,ਕਾਲਜ ਪੰਜਾਬੀ ਵਿਆਕਰਣ ,ਪੰਜਾਬ ਸਟੇਟ ਯੂਨੀ.ਟੈਕਸਟ ਬੁੱਕ ਬੋਰਡ,ਚੰਡੀਗੜ੍ਹ
9.ਸੰਤ ਸਿੰਘ ਸੇਖੋਂ,ਸਾਹਿਤਆਰਥ,ਲਾਹੌਰ ਬੁੱਕ ਸ਼ਾਪ,ਲੁਧਿਆਣਾ

ਬੀ.ਸੀ.ਏ. ਭਾਗ ਦੂਜਾ,ਸਮੈਸਟਰ ਚੌਥਾ

ਪੇਪਰ- ਪੰਜਾਬੀ ਮੁੱਢਲਾ ਗਿਆਨ

ਪੇਪਰ ਕੋਡ:**PBCA-401B**,ਕ੍ਰੈਡਿਟ-02

2020-21,2021-22,2022-23 ਸੈਸ਼ਨ ਲਈ

ਕੁੱਲ ਅੰਕ :50 ਵਿਸ਼ੇ ਵਿਚੋਂ ਪਾਸ ਅੰਕ : 17

ਬਾਹਰੀ ਪਰੀਖਿਆ:35 ਅੰਕ ਬਾਹਰੀ ਪਰੀਖਿਆ ਵਿਚੋਂ ਪਾਸ ਅੰਕ: 12

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ :15 ਅੰਕ ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ ਵਿਚੋਂ ਪਾਸ ਅੰਕ:05

ਸਮਾਂ:3 ਘੰਟੇ ਕੁੱਲ ਲੈਕਚਰ:30

ਪਾਠਕ੍ਰਮ ਦਾ ਉਦੇਸ਼:

1.ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸਾਹਿਤ ਪੜ੍ਹਨ ਲਈ ਪ੍ਰੇਰਿਤ ਕਰਨਾ।

2.ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਜਾਣਕਾਰੀ ਦੇਣਾ।

3.ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸਹਿਤ ਸਿਰਜਣ ਲਈ ਪ੍ਰੇਰਿਤ ਕਰਨਾ।

4.ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸਭਿਆਚਾਰ,ਲੋਕਧਾਰਾ ਅਤੇ ਨੈਤਿਕ ਕਦਰਾਂ -ਕੀਮਤਾਂ ਤੋਂ ਜਾਣੂ ਕਰਵਾਉਣਾ।

ਪੇਪਰ ਸੈੱਟਰ ਅਤੇ ਵਿਦਿਆਰਥੀਆਂ ਲਈ ਹਦਾਇਤਾਂ:

1.ਸਾਰਾ ਸਿਲੇਬਸ 'ਅੱਖਰ ਗਿਆਨ (ਭਾਗ-ਦੂਜਾ)'ਵਿਚੋਂ ਹੀ ਪਾਇਆ ਜਾਵੇ।

2.ਭਾਗ-ਓ: ਵਿਚ ਕਹਾਣੀ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ /ਸਾਰ (ਤਿੰਨ ਵਿਚੋਂ ਇੱਕ)08ਅੰਕ

3.ਭਾਗ-ਅ:1 ਵਿਚ ਨਿੱਜੀ ਚਿੱਠੀ-ਪੱਤਰ (ਤਿੰਨ ਵਿਚੋਂ ਇੱਕ) 05 ਅੰਕ

4.ਭਾਗ-ਅ:2 ਵਿਚ ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ ਵਿਚ ਤਕਨੀਕੀ ਸ਼ਬਦਾਵਲੀ (ਸੋਲਾ ਵਿਚੋਂ ਅੱਠ) 04 ਅੰਕ

5.ਭਾਗ-ਅ:3 ਵਿਚ ਵਿਆਕਰਨ ਨਾਲ ਸੰਬੰਧਿਤ ਪ੍ਰਸ਼ਨ (ਦੋ ਵਿਚੋਂ ਇੱਕ) 08 ਅੰਕ

6.ਭਾਗ-ਏ ਵਿਚ ਕਹਾਣੀਆਂ,ਤਕਨੀਕੀ ਸ਼ਬਦਾਵਲੀ ਅਤੇ ਵਿਆਕਰਨ ਵਿਚੋਂ ਕੁੱਲ 10 ਆਬਜੈਕਟਿਵ ਪ੍ਰਸ਼ਨ ।ਵਿਦਿਆਰਥੀਆਂ ਲਈ ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹਨ । ਇੱਕ ਪ੍ਰਸ਼ਨ 01 ਅੰਕ ਦਾ ਹੋਵੇਗਾ । (**10X1=10** ਅੰਕ)

ਪਾਠਕ੍ਰਮ ਅਤੇ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੀ ਰੂਪ-ਰੇਖਾ

ਭਾਗ-ਓ

ਓ -ਅੱਖਰ ਗਿਆਨ (ਭਾਗ-ਦੂਜਾ),ਮੁੱਖ ਸੰਪਾ. ਡਾ.ਜਸਵੀਰ ਸਿੰਘ ,ਸੰਪਾ.ਡਾ.ਅਵਤਾਰ ਸਿੰਘ, ਡਾ.ਗੁਰਪ੍ਰੀਤ ਕੌਰ,ਪ੍ਰੋ.ਸੁਖਵਿੰਦਰ ਸਿੰਘ, ਸ੍ਰੀ ਗੁਰੂ ਤੇਗ਼ ਬਹਾਦਰ ਖ਼ਾਲਸਾ ਕਾਲਜ,ਸ੍ਰੀ ਅਨੰਦਪੁਰ ਸਾਹਿਬ,ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ,ਪੁਸਤਕ ਵਿੱਚੋਂ ਕਹਾਣੀਆਂ ਵਾਲਾ ਭਾਗ

ਭਾਗ-ਅ

ਅ-1.ਨਿੱਜੀ ਚਿੱਠੀ-ਪੱਤਰ

ਅ-2 .ਤਕਨੀਕੀ ਸ਼ਬਦਾਵਲੀ

ਅ-3 .ਸੰਬੰਧਕ ਅਤੇ ਯੋਜਕ :ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਕਿਸਮਾਂ

ਭਾਗ-ਏ

ਕਹਾਣੀਆਂ,ਤਕਨੀਕੀ ਸ਼ਬਦਾਵਲੀ ਅਤੇ ਵਿਆਕਰਨ ਵਿਚੋਂ ਆਬਜੈਕਟਿਵ ਪ੍ਰਸ਼ਨ

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1.ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ ਤੇ ਭਾਸ਼ਾ ਵਿਗਿਆਨ,ਤਕਨੀਕੀ ਸ਼ਬਦਾਵਲੀ ਦਾ ਵਿਸ਼ਾ ਕੋਸ਼, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ,2009

2.ਡਾ.ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ ਅਤੇ ਹੋਰ,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨ ਭਾਗ **I**,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ,ਜਲੰਧਰ,1991

3.ਡਾ.ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ ਅਤੇ ਹੋਰ,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨ ਭਾਗ **II**,ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ,ਜਲੰਧਰ,1991

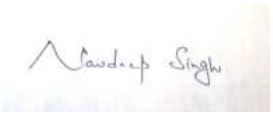
Note:

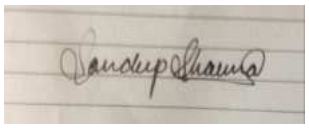
1. The committee also recommends to continue the syllabus of Punjabi University, Patiala for BCA-IIIrd Year.

2. Credits are exceeded due to Credits given to Course work of Punjabi Compulsory as per Punjab State Policy.

Members of Board of Studies

1. Dr. Surender Kumar **2. Dr. Dharamveer Sharma** **3. Dr. Major Singh Goraya**





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