

# **B.Sc. (Information Technology)**

## **Syllabus**

**Session (2020-2021)**



**KHALSA COLLEGE**  
**AMRITSAR**  
*-An Autonomous College*

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- 2. Subject to change in the syllabi at any time. Please visit the Khalsa College website time to time.**

# B.Sc. (Information Technology)

## Semester-I

Sr. No	Paper Code	Paper Name	Marks				Page No.
			Theory	Practical	Internal Assessment	Total Marks	
1	Paper-I	Fundamentals of Computers	56	-	19	75	128
2	Paper-II	Introduction to Programming-C	56	-	19	75	129
3	Paper-III	Applied & Discrete Mathematics	56	-	19	75	130
4	Paper-IV	Communication Skills in English	37	-	13	50	131
5	Paper-V	Punjabi/Basic Punjabi (Mudhli Punjabi) (Compulsory)	37	-	13	50	132-133
6	Paper-VI	Practical- PC Computing & C - Language	-	56	19	75	134
7	Paper-VII	*Drug Abuse: Problem, Management and Prevention (Compulsory Paper)	37		13	50	135-136

- Marks of Paper-VII will not be included in the Total Marks

## B.Sc. (Information Technology) Semester – I

### Paper – I: Fundamentals of Computers

**Time: 3 Hours**

**Max. Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment Marks: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

#### UNIT-I

##### **1. Introduction to Computer:**

Computer System Characteristics, Hardware - CPU, Memory, Input, Output & Storage devices, Organization of Secondary Storage Media, Software - System & Application, Types of processing: Batch and On-line.

##### **2. MS Word 2010:**

Overview, creating, saving, opening, importing, exporting and inserting files, formatting pages, paragraphs and sections, indents and outdents, creating lists and numbering. Headings, styles, fonts and font size. Editing, positioning and viewing texts, Finding and replacing text, inserting page breaks, page numbers, book marks, symbols and dates. Using tabs and tables, header, footer and printing. Headers and Footers, Mail merge, macros, tables.

#### UNIT-II

##### **3. Operating System Concepts:**

Role of an Operating System, Types of operating systems, Booting procedure and its types, Fundamentals and typical instructions of Windows & Non-Windows based Operating Systems.

##### **4. MS – PowerPoint 2010:**

Introduction to MS Power Point, Power Point Elements, Exploring Power Point Menu, Working with Dialog Boxes, Saving Presentation, Printing Slides, Slide View, Slide Sorter view, notes view, outline view, Formatting and enhancing text formatting.

##### **References:**

1. R.K. Taxali : Introduction to Software Packages, Galgotia Publications.
2. MS–Office , Compiled by SYBIX.
3. MS–Office , BPB Publications.
4. Introduction to Computer, P.K. Sinha.

## B.Sc. (Information Technology) Semester – I

### Paper–II: Introduction to Programming - C

**Time: 3 Hours**

**Max. Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment Marks: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

#### Unit –I

**Fundamentals:** Character set, Identifiers and Key Words, Data types, Constants, Variables, Expressions, Statements, Symbolic Constants.

**Operations and Expressions:** Arithmetic operators, Unary operators, Relational Operators, Logical Operators, Assignment and Conditional Operators, Library functions. Data Input and Output statements

**Control Statements:** Preliminaries, While, Do–while and for statements, Nested loops, If–else, Switch, Break – Continue statements.

**Program Structure Storage Class:** Automatic, external and static variables, multiple programs, more about library functions.

**Functions:** Brief overview, defining, accessing functions, passing arguments to function, specifying argument data types, function prototypes, recursion.

#### Unit –II

**Arrays:** Defining, processing an array, passing arrays to a function, multi–dimensional arrays.

**Strings:** String declaration, string functions and string manipulation

**Structures & Unions:** Defining and processing a structure, user defined data types, structures and pointers, passing structures to functions, self-referenced structure and unions.

**Pointers:** Fundamentals, pointer declaration, passing pointer to a function, pointer and one dimensional arrays, operation on pointers, pointers & multi–dimensional arrays of pointers, passing functions, other functions, more about pointer declarations.

#### **References:**

1. Balaguruswamy: “Programming in ANSIC”.
2. Scaum Outline Series: “Programming in C”.
3. Dennis & Ritchie: “Programming in C”.
4. Stephen G. Kochar: “C Programming”.

**B.Sc. (Information Technology) Semester – I****Paper III: Applied & Discrete Mathematics****Time: 3 Hours****Max. Marks: 75****Theory Marks: 56****Theory Internal Assessment Marks: 19****Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

**Unit-I**

**Sets and Relations:** Definition of sets, subsets, complement of a set, universal set, intersection and union of sets, De-Morgan's laws, Cartesian products, Equivalent sets, Countable and uncountable sets, minset, Partitions of sets, Relations: Basic definitions, graphs of relations, properties of relations

**Logic and Propositional Calculus:** Proposition and Compound Propositions, basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions, Logical Equivalence, Duality law, Algebra of propositions, Conditional and Bi conditional Statements, Arguments, Logical Implication, Propositional Functions, Predicates and Quantifiers, Negation of Quantified Statements, Inference theory of the predicates calculus.

**Unit-II**

**Boolean Algebra:** Boolean algebra and its duality, Duality, Boolean Algebra as Lattices, Boolean identities, sub-algebra, Representation Theorem, Sum-of-Products Form for Sets, Sum of-Products Form for Boolean Algebra, Minimal Boolean Expressions, Prime Implicants, Boolean Functions, Karnaugh Maps.

**Matrices:** Introduction of a Matrix, its different kinds, matrix addition and scalar multiplication, multiplication of matrices, transpose etc. Square matrices, inverse and rank of a square matrix, Matrix Inversion method.

**Graph Theory:** A general introduction, simple and multi graphs, directed and undirected graphs, Eulerian and Hamiltonian Graphs, Shortest path algorithms, Chromatic number, Bi partite graph, graph coloring.

**References:**

1. Lipschutz, S. and Lipson, M.: Discrete Mathematics (Schaum's outlines series).
2. Kolman and Busby "Discrete Mathematical structures for Computer Sciences" PHI.
3. Alan Doerr, "Applied Discrete Structures for Computer Science", Galgotia Publications.
4. Trambly, J.P. and Manohar, R: Discrete Mathematical Structures with Applications to Computer Science.

**B.Sc. (Information Technology) Semester – I****COMMUNICATION SKILLS IN ENGLISH****Time: 3 Hours**

**Max. Marks: 50**  
**Theory Marks: 37**  
**Internal assessment : 13**  
**Lectures /week : 6**

**Course Contents:**

**1. Reading Skills:** Reading tactics and strategies; Reading purposes—kinds of purposes and associated comprehension; Reading for direct meanings; Reading for understanding concepts, details, coherence, logical progression and meanings of phrases/ expressions.

**Activities:**

- a) Active reading of passages on general topics
- b) Reading newspaper, articles, editorials etc.
- c) Short questions based on content and development of ideas of a given paragraph.

**2. Writing Skills:** Guidelines for effective writing; writing styles for application, resume, personal letter, official/ business letter, memo, notices etc.

**Activities:**

- a) Personal and business letters.
- b) Converting a biographical note into a sequenced resume.
- c) Writing notices for circulation/ boards.
- d) Making notes of given passage with headings and sub-headings
- e) Writing newspaper reports based on given heading.

**Suggested Pattern of Question Paper:**

The question paper will consist of Seven skill-oriented questions from Reading and Writing Skills. The first 6 Questions carry 5 marks each. The 7<sup>th</sup> Question carries 7 marks. The questions shall be phrased in a manner that students know clearly what is expected of them. There will be internal choice wherever possible.

- i) Comprehension questions of an unseen passage.
- ii) Personal letter Official/Business letters.
- iii) Writing notices/agenda/resolution/ minutes for public circulation on topics of professional interest
- iv) Writing resume or converting a biographical note into resume
- v) Writing news report based on a given heading
- vi) Do as directed

Articles Units 69-81

Conjunctions Units 113-120

(6X5=30 Marks)

- vii) Translation from English to Vernacular (Punjabi/ Hindi) (Isolated Sentences)

(1X7=7 Marks)

**Prescribed Book:***Murphy's English Grammar* (by Raymond Murphy) CUP**Recommended Books:**

1. *Oxford Guide to Effective Writing and Speaking* by John Seely.
2. *The Written Word* by Vandana R Singh, Oxford University Press

## B.Sc. (Information Technology) Semester – I

### ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ

ਸਮਾਂ : 3 ਘੰਟੇ

ਥਿਊਰੀ ਅੰਕ : 37  
ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ : 13  
ਕੁੱਲ ਅੰਕ : 50

### ਪਾਠ-ਕ੍ਰਮ

#### ਭਾਗ-ਪਹਿਲਾ

**ਸਾਹਿਤ ਦੇ ਰੰਗ** (ਭਾਗ ਪਹਿਲਾ -ਕਵਿਤਾ ਅਤੇ ਕਹਾਣੀ)  
ਡਾ. ਮਹਿਲ ਸਿੰਘ (ਸੰਪਾ.), ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।  
(ਲੇਖਕ ਦਾ ਜੀਵਨ ਅਤੇ ਰਚਨਾ/ਸਾਰ/ਵਿਸ਼ਾ-ਵਸਤੂ)

#### ਭਾਗ-ਦੂਜਾ

**ਇਤਿਹਾਸਿਕ ਯਾਦਾਂ**  
ਸ. ਸ. ਅਮੋਲ (ਸੰਪਾ.), ਪੰਜਾਬੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।  
(ਨਿਬੰਧ 1 ਤੋਂ 6 ਤਕ ਸਾਰ/ ਵਿਸ਼ਾ-ਵਸਤੂ/ਸ਼ੈਲੀ)

#### ਭਾਗ-ਤੀਜਾ

(ੳ) ਪੈਰਾ ਰਚਨਾ (ਤਿੰਨਾਂ ਵਿਚੋਂ ਇੱਕ)  
(ਅ) ਪੈਰਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ

#### ਭਾਗ-ਚੌਥਾ

(ੳ) ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ : ਭਾਸ਼ਾ ਦਾ ਟਕਸਾਲੀ ਰੂਪ, ਭਾਸ਼ਾ ਅਤੇ ਉਪ-ਭਾਸ਼ਾ ਵਿਚਲਾ ਅੰਤਰ, ਪੰਜਾਬੀ ਉਪ-ਭਾਸ਼ਾਵਾਂ ਦੇ ਪਛਾਣ-ਚਿੰਨ੍ਹ  
(ਅ) ਪੰਜਾਬੀ ਭਾਸ਼ਾ - ਨਿਕਾਸ ਤੇ ਵਿਕਾਸ

### ਅੰਕ-ਵੰਡ ਅਤੇ ਪ੍ਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਸਿਲੇਬਸ ਦੇ ਚਾਰ ਭਾਗ ਹਨ ਪਰ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੇ ਪੰਜ ਭਾਗ ਹੋਣਗੇ।
2. ਪਹਿਲੇ ਚਾਰ ਭਾਗਾਂ ਵਿਚ 02-02 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰੇਕ ਭਾਗ ਵਿਚੋਂ 01-01 ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੋਵੇਗਾ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ (08) ਅੰਕ ਹੋਣਗੇ।
3. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਪੰਜਵੇਂ ਭਾਗ ਵਿਚ ਸਾਰੇ ਸਿਲੇਬਸ ਵਿਚੋਂ 01-01 ਅੰਕ ਦੇ ਛੇ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ, ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ 05 ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ ਦੇਣਾ ਲਾਜ਼ਮੀ ਹੋਵੇਗਾ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

**ਨੋਟ :** ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ 13 ਅੰਕਾਂ ਦੀ ਹੈ, ਜੋ ਕਾਲਜ ਵੱਲੋਂ ਨਿਰਧਾਰਿਤ ਦਿਸ਼ਾ ਨਿਰਦੇਸ਼ਾਂ ਅਨੁਸਾਰ ਇਨ੍ਹਾਂ ਅੰਕਾਂ ਤੋਂ ਵੱਖਰੀ ਹੋਵੇਗੀ। ਇਸ ਪੇਪਰ ਦੇ ਕੁੱਲ ਅੰਕ 37+13 = 50 ਹਨ।

**B.Sc. (Information Technology) Semester – I****ਮੁੱਢਲੀ ਪੰਜਾਬੀ (In Lieu of Compulsory Punjabi)**

ਸਮਾਂ : 3 ਘੰਟੇ

ਥਿਊਰੀ ਅੰਕ : 37

ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ : 13

ਕੁਲ ਅੰਕ: 50

1. **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੇ ਗੁਰਮੁਖੀ ਲਿਪੀ**  
 ਓ) ਨਾਮਕਰਣ ਤੇ ਸੰਖੇਪ ਜਾਣ ਪਛਾਣ : ਗੁਰਮੁਖੀ ਵਰਣਮਾਲਾ, ਅੱਖਰ ਕ੍ਰਮ, ਸਵਰ ਵਾਹਕ (ਓ ਅ ਏ) ਲਗਾਂ ਮਾਤਰਾਂ, ਪੈਰ ਵਿਚ ਬਿੰਦੀ ਵਾਲੇ ਵਰਣ, ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣ, ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ।  
 ਅ) ਸਿਖਲਾਈ ਤੇ ਅਭਿਆਸ **12 ਅੰਕ**
2. **ਗੁਰਮੁਖੀ, ਆਰਥੋਗ੍ਰਾਫੀ ਅਤੇ ਉਚਾਰਨ** : ਸਵਰ, ਵਿਅੰਜਨ : ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ ਅਤੇ ਉਚਾਰਣ, ਮੁਹਾਰਨੀ, ਲਗਾਂ ਮਾਤਰਾਂ ਦੀ ਪਛਾਣ ।  
**10 ਅੰਕ**
3. **ਪੰਜਾਬੀ ਸ਼ਬਦ ਜੋੜ** : ਮੁਕਤਾ (ਦੋ ਅੱਖਰਾਂ ਵਾਲੇ ਸ਼ਬਦ, ਤਿੰਨ ਅੱਖਰਾਂ ਵਾਲੇ ਸ਼ਬਦ), ਸਿਹਾਰੀ ਵਾਲੇ ਸ਼ਬਦ, ਬਿਹਾਰੀ ਵਾਲੇ ਸ਼ਬਦ, ਔਂਕੜ ਵਾਲੇ ਸ਼ਬਦ, ਦੁਲੈਂਕੜ ਵਾਲੇ ਸ਼ਬਦ, ਲਾਂ ਵਾਲੇ ਸ਼ਬਦ, ਦੁਲਾਵਾਂ ਵਾਲੇ ਸ਼ਬਦ, ਹੋੜੇ ਵਾਲੇ ਸ਼ਬਦ, ਕਨੋੜੇ ਵਾਲੇ ਸ਼ਬਦ, ਲਗਾਂਖਰ (ਟਿੱਪੀ, ਬਿੰਦੀ, ਅੱਧਕ) ਵਾਲੇ ਸ਼ਬਦ, ਸੁੱਧ-ਅਸੁੱਧ। **15 ਅੰਕ**

**ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ**

1. ਪਹਿਲੇ ਭਾਗ ਵਿਚੋਂ ਵਰਣਨਾਤਮਕ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ ਤਿੰਨ ਪ੍ਰਸ਼ਨਾਂ ਦਾ ਉੱਤਰ ਦੇਣਾ ਲਾਜ਼ਮੀ ਹੈ। ਹਰ ਪ੍ਰਸ਼ਨ ਦੇ ਚਾਰ-ਚਾਰ ਅੰਕ ਹਨ।  
**(4+4+4) 12 ਅੰਕ**
2. ਭਾਗ ਦੂਸਰਾ ਵਿਚੋਂ ਦੋ-ਦੋ ਨੰਬਰ ਦੇ ਪੰਜ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹਨ।  
**10 ਅੰਕ**
3. ਭਾਗ ਤੀਸਰਾ ਵਿਚੋਂ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿਨ੍ਹਾਂ ਦੇ ਪੰਜ-ਪੰਜ ਅੰਕ ਹਨ।  
**15 ਅੰਕ**

**ਨੋਟ:** ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ 13 ਅੰਕਾਂ ਦੀ ਹੈ, ਜੋ ਕਾਲਜ ਵੱਲੋਂ ਨਿਰਧਾਰਿਤ ਦਿਸ਼ਾ ਨਿਰਦੇਸ਼ਾਂ ਅਨੁਸਾਰ ਇਨ੍ਹਾਂ ਅੰਕਾਂ ਤੋਂ ਵੱਖਰੀ ਹੋਵੇਗੀ। ਇਸ ਪੇਪਰ ਦੇ ਕੁਲ ਅੰਕ  $37+13 = 50$  ਹਨ।



**B.Sc. (Information Technology) Semester – I**

**Paper –VI (Practical)**

**PC Computing and C Language**

**Time: 3 Hours**

**Max. Marks: 75**

**Practical Marks: 56**

**Practical Internal Assessment Marks: 19**

**B.Sc. (Information Technology) Semester – I**  
**Paper VII: Drug Abuse: Problem, Management and Prevention**  
**(Compulsory Paper)**

**PROBLEM OF DRUG ABUSE**

**Time: 3 Hours**

**Max. Marks: 50**  
**Theory Marks: 37**  
**Internal assessment: 13**

**Instructions for the Paper Setters:**

Section–A: (09 Marks): It will consist of five short answer type questions. Candidates will be required to attempt three questions, each question carrying 03 marks. Answer to any of the questions should not exceed two pages.

Section–B: (16 Marks) It will consist of four essay type questions. Candidates will be required to attempt two questions, each question carrying 08 marks. Answer to any of the questions should not exceed four pages.

Section–C: (12 Marks) It will consist of two questions. Candidate will be required to attempt one question only. Answer to the question should not exceed 5 pages

**UNIT-I**

- **Meaning of Drug Abuse**

Meaning, Nature and Extent of Drug Abuse in India and Punjab.

**UNIT-II**

- **Consequences of Drug Abuse for:**

Individual : Education, Employment, Income.

Family : Violence.

Society : Crime.

Nation : Law and Order problem.

**UNIT-III**

- **Management of Drug Abuse**

Medical Management: Medication for treatment and to reduce withdrawal effects.

**UNIT-IV**

- **Psychiatric Management: Counseling, Behavioral and Cognitive therapy.**

- **Social Management: Family, Group therapy and Environmental Intervention.**

**References:**

1. Ahuja, Ram (2003), Social Problems in India, Rawat Publication, Jaipur.
  2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
  3. Inciardi, J.A. 1981. The Drug Crime Connection. Beverly Hills: Sage Publications. 23
  4. Kapoor. T. (1985) Drug epidemic among Indian Youth, New Delhi: Mittal Pub.
  5. Modi, Ishwar and Modi, Shalini (1997) Drugs: Addiction and Prevention, Jaipur: Rawat Publication.
  6. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
  7. Randhawa, J.K. and Randhawa, Samreet 2018. Drug Abuse-Management and Prevention. Kasturi Lal & Sons, Educational Publishers, Amritsar- Jalandhar.
  8. Sain, Bhim 1991, Drug Addiction Alcoholism, Smoking obscenity New Delhi: Mittal Publications.
  9. Sandhu, Ranvinder Singh, 2009, Drug Addiction in Punjab: A Sociological Study. Amritsar: Guru Nanak Dev University.
  10. Singh, Chandra Paul 2000. Alcohol and Dependence among Industrial Workers: Delhi: Shipra.
  11. Sussman, S and Ames, S.L. (2008). Drug Abuse: Concepts, Prevention and Cessation, Cambridge University Press.
  12. World Drug Report 2010, United Nations office of Drug and Crime.
  13. World Drug Report 2011, United Nations office of Drug and Crime.
- 
1. Jasjit Kaur Randhawa & Samreet Randhawa, "Drug Abuse Problem, Management & Prevention", KLS, ISBN No. 978-81-936570-8-9, (2019).
  2. Jasjit Kaur Randhawa, "Drug Abuse -Management & Prevention", KLS, ISBN No. 978-93-81278-80-2, (2018).
  3. Rama Gandotra & Jasjit Kaur Randhawa, "voZrI d[otos'A^(BPky'oh) gqpzXB ns/ o'eEkw", KLS, ISBN No. 978-93-81278-87-1, (2018).
  4. Jasjit Kaur Randhawa & Samreet Randhawa, "Drug Abuse-Problem, Management & Prevention", KLS, ISBN No. 978-81-936570-6-5, (2018).
  5. Jasjit Kaur Randhawa & Samreet Randhawa, "voZrI d[otos'A^(BPky'oh) ;wZf;nk, gqpzXB ns/ o'eEkw", KLS, ISBN No. 978-81-936570-7-1, (2018).

# B.Sc. (Information Technology)

## Semester-II

Sr. No.	Paper Code	Paper Name	Marks				Page No.
			Theory	Practical	Internal Assessment	Total Marks	
1	Paper-I	Communication Skills in English	37	-	13	50	138
2	Paper-II	Punjabi/Basic Punjabi (Mudhli Punjabi) (Compulsory)	37	-	13	50	139-140
3	Paper-III	Principles of Digital Electronics	56	-	19	75	141
4	Paper-IV	Introduction to Programming-C++	56	-	19	75	142-143
5	Paper-V	Numerical Methods & Statistical Techniques	56	-	19	75	144
6	Paper-VI	Practical- C++Programming Language	-	56	19	75	145
7	Paper-VII	*Drug Abuse: Problem, Management and Prevention (Compulsory Paper)	37		13	50	146-147

- Marks of Paper-VII will not be included in the Total Marks

## B.Sc. (Information Technology) Semester – II

### COMMUNICATION SKILLS IN ENGLISH

**Time: 3 Hours**

**Max. Marks: 50**  
**Theory Marks: 37**  
**Internal Assessment: 13**  
**Lecture/ week: 6**

**Course Contents:**

1. **Listening Skills:** Barriers to listening; effective listening skills; feedback skills, attending telephone calls; note taking.

**Activities:**

- a) Listening exercises – Listening to conversation, speech/ lecture and taking notes.

2. **Speaking and Conversational Skills:** Components of a meaningful and easy conversation; understanding the cue and making appropriate responses; forms of polite speech; asking and providing information on general topics, situation based Conversation in English; essentials of Spoken English

**Activities:**

- a) Conversation; dialogue and speech
- b) Oral description or explanation of a common object, situation or concept.
- c) Interviews and group discussion

**Suggested Pattern of Question Paper:**

The question paper will consist of Seven skill-oriented questions from Listening and Speaking Skills. The first 6 Questions carry 5 marks each. The 7<sup>th</sup> Question carries 7 marks. The questions shall be phrased in a manner that students know clearly what is expected of them. There will be internal choice wherever possible.

- i) Making summary/ précis or paraphrasing of an idea of a given passage.
- ii) Writing a paragraph of expository or argumentative nature of a given topic.
- iii) Interpretation of a given data, chart, diagram etc and making a brief report.
- iv) Transcoding (given dialogue to a prose or given prose to dialogue).
- v) Draft an Advertisement for a given Product and E-mail Writing.
- vi) Do as directed Change of voice Units 42-46  
(6X5= 30Marks)
- vii) Translation from Vernacular (Punjabi/ Hindi) to English (Isolated Sentences)  
(1X7  
= 7Marks)

**Prescribed Book:**

*Murphy's English Grammar* (by Raymond Murphy) CUP

**Recommended Books:**

1. *Oxford Guide to Effective Writing and Speaking* by John Seely.  
*The Written Word* by Vandana R Singh, Oxford University Press

## B.Sc. (Information Technology) Semester – II

### ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ

ਸਮਾਂ : 3 ਘੰਟੇ

ਥਿਊਰੀ ਅੰਕ : 37  
ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ: 13  
ਕੁੱਲ ਅੰਕ: 50

### ਪਾਠ-ਕ੍ਰਮ

#### ਭਾਗ-ਪਹਿਲਾ

ਸਾਹਿਤ ਦੇ ਰੰਗ (ਭਾਗ ਦੂਜਾ - ਵਾਰਤਕ ਅਤੇ ਰੇਖਾ-ਚਿੱਤਰ)  
ਡਾ. ਮਹਿਲ ਸਿੰਘ (ਸੰਪਾ.), ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।  
(ਕਿਸੇ ਲੇਖ ਅਤੇ ਰੇਖਾ-ਚਿੱਤਰ ਦਾ ਸਾਰ/ਵਿਸ਼ਾ-ਵਸਤੂ/ਨਾਇਕ ਬਿੰਬ)

#### ਭਾਗ-ਦੂਜਾ

##### ਇਤਿਹਾਸਿਕ ਯਾਦਾਂ

ਸ. ਸ. ਅਮੋਲ (ਸੰਪਾ.), ਪੰਜਾਬੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।  
(ਨਿਬੰਧ 7 ਤੋਂ 12 ਤਕ ਸਾਰ/ ਵਿਸ਼ਾ-ਵਸਤੂ/ਸ਼ੈਲੀ)

#### ਭਾਗ-ਤੀਜਾ

(ੳ) ਸ਼ਬਦ-ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ-ਰਚਨਾ - ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਮੁੱਢਲੇ ਸੰਕਲਪ  
(ਅ) ਸ਼ਬਦ-ਸ਼੍ਰੇਣੀਆਂ

#### ਭਾਗ-ਚੌਥਾ

(ੳ) ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ  
(ਅ) ਮੁਹਾਵਰੇ ਅਤੇ ਅਖਾਣ

#### ਅੰਕ-ਵੰਡ ਅਤੇ ਪ੍ਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਸਿਲੇਬਸ ਦੇ ਚਾਰ ਭਾਗ ਹਨ ਪਰ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੇ ਪੰਜ ਭਾਗ ਹੋਣਗੇ।
2. ਪਹਿਲੇ ਚਾਰ ਭਾਗਾਂ ਵਿਚ 02-02 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰੇਕ ਭਾਗ ਵਿਚੋਂ 01-01 ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੋਵੇਗਾ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ (08) ਅੰਕ ਹੋਣਗੇ।
3. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਪੰਜਵੇਂ ਭਾਗ ਵਿਚ ਸਾਰੇ ਸਿਲੇਬਸ ਵਿਚੋਂ 01-01 ਅੰਕ ਦੇ ਛੇ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ, ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ 05 ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ ਦੇਣਾ ਲਾਜ਼ਮੀ ਹੋਵੇਗਾ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

**ਨੋਟ :** ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ 13 ਅੰਕਾਂ ਦੀ ਹੈ, ਜੋ ਕਾਲਜ ਵੱਲੋਂ ਨਿਰਧਾਰਿਤ ਦਿਸ਼ਾ ਨਿਰਦੇਸ਼ਾਂ ਅਨੁਸਾਰ ਇਨ੍ਹਾਂ ਅੰਕਾਂ ਤੋਂ ਵੱਖਰੀ ਹੋਵੇਗੀ। ਇਸ ਪੇਪਰ ਦੇ ਕੁੱਲ ਅੰਕ  $37+13 = 50$  ਹਨ।

## B.Sc. (Information Technology) Semester – II

### ਮੁੱਢਲੀ ਪੰਜਾਬੀ (In Lieu of Compulsory Punjab)

ਸਮਾਂ : 3 ਘੰਟੇ

ਥਿਊਰੀ ਅੰਕ : 37

ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ : 13

ਕੁਲ ਅੰਕ : 50

#### ਪਾਠ-ਕ੍ਰਮ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ

1. ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਧਾਤੂ, ਵਧੇਤਰ (ਅਗੇਤਰ, ਮਧੇਤਰ, ਪਿਛੇਤਰ), ਪੰਜਾਬੀ ਕੋਸ਼ਗਤ ਸ਼ਬਦ ਅਤੇ ਵਿਆਕਰਣਿਕ ਸ਼ਬਦ

12 ਅੰਕ

2. ਪੰਜਾਬੀ ਸ਼ਬਦ ਪ੍ਰਕਾਰ :

ੳ) ਸੰਯੁਕਤ ਸ਼ਬਦ, ਸਮਾਸੀ ਸ਼ਬਦ, ਦੋਜਾਤੀ ਸ਼ਬਦ, ਦੋਹਰੇ/ਦੁਹਰਕਤੀ ਸ਼ਬਦ ਅਤੇ ਮਿਸ਼ਰਤ ਸ਼ਬਦ  
ਅ) ਸਿਖਲਾਈ ਤੇ ਅਭਿਆਸ

10 ਅੰਕ

3. ਪੰਜਾਬੀ ਸ਼ਬਦ ਰਚਨਾ :

ੳ) ਇੱਕ-ਵਚਨ ਬਹੁ-ਵਚਨ, ਲਿੰਗ-ਪੁਲਿੰਗ, ਬਹੁ-ਅਰਥਕ ਸ਼ਬਦ, ਸਮਾਨ-ਅਰਥਕ ਸ਼ਬਦ, ਬਹੁਤੇ ਸ਼ਬਦਾਂ ਲਈ ਇੱਕ ਸ਼ਬਦ, ਸ਼ਬਦ ਜੋੜ, ਵਿਰੋਧਆਰਥਕ ਸ਼ਬਦ

ਅ) ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ : ਖਾਣ-ਪੀਣ, ਸਾਕਾਦਾਰੀ, ਰੁੱਤਾਂ, ਮਹੀਨਿਆਂ, ਗਿਣਤੀ, ਮੌਸਮ, ਮਾਰਕੀਟ/ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਧੰਦਿਆਂ ਨਾਲ ਸੰਬੰਧਿਤ।

10+5=15 ਅੰਕ

#### ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਭਾਗ ਪਹਿਲਾਂ ਵਿਚੋਂ ਚਾਰ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ ਤਿੰਨ ਪ੍ਰਸ਼ਨਾਂ ਦਾ ਉੱਤਰ ਦੇਣਾ ਲਾਜ਼ਮੀ ਹਨ। ਹਰ ਪ੍ਰਸ਼ਨ ਦੇ ਪੰਜ-ਪੰਜ ਨੰਬਰ ਹਨ।

2. (4+4+4) 12 ਅੰਕ

2. ਭਾਗ ਦੂਸਰਾ ਵਿਚੋਂ ਦੋ-ਦੋ ਨੰਬਰ ਦੇ ਪੰਜ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹਨ। 10 ਅੰਕ

3. ਭਾਗ ਤੀਸਰਾ ਦੇ (ੳ) ਭਾਗ ਵਿਚੋਂ ਦੋ ਸਵਾਲ ਅਤੇ (ਅ) ਭਾਗ ਵਿਚੋਂ ਇੱਕ ਸਵਾਲ ਪੁੱਛਿਆ ਜਾਵੇਗਾ। ਹਰ ਪ੍ਰਸ਼ਨ ਦੇ ਪੰਜ-ਪੰਜ ਅੰਕ ਹਨ।

10+5=15 ਅੰਕ

ਨੋਟ: ਇੰਟਰਨਲ ਅਸੈਸਮੈਂਟ 13 ਅੰਕਾਂ ਦੀ ਹੈ, ਜੋ ਕਾਲਜ ਵਲੋਂ ਨਿਰਧਾਰਿਤ ਦਿਸ਼ਾ ਨਿਰਦੇਸ਼ਾਂ ਅਨੁਸਾਰ ਇਨ੍ਹਾਂ ਅੰਕਾਂ ਤੋਂ ਵੱਖਰੀ ਹੋਵੇਗੀ। ਇਸ ਪੇਪਰ ਦੇ ਕੁਲ ਅੰਕ 37+13 = 50 ਹਨ।

**B.Sc. (Information Technology) Semester – II**  
**Paper: III Principles of Digital Electronics**

**Time: 3 Hours**

**Total Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment M: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

The total weightage of this section shall be **22 marks**.

**Unit-I**

**1. Number Systems:** Introduction to Decimal, Binary, Octal and Hexadecimal Numbers. Complements. Signed Binary Numbers (Arithmetic Addition & Subtraction), Binary Codes:(BCD,Excess-3,Gray codes, ASCII), Binary Storage and Registers.

**2. Boolean Algebra and Logic Gates:** Basic Definitions: Postulates and theorems of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, De-Morgan's Theorem Reducing Boolean expressions, Digital Logic Gates: (AND, OR NOT ,NAND, NOR, EX-OR, EX-NOR), Implementations using Basic Gates, Universal Gates

**3. Minimization Techniques:** Canonical and Standard forms SOP and POS of Boolean functions , K-Maps simplifications up to Five-Variable Map, Sum of Products and Product of Sums Simplification, Don't-Care Conditions.

**4. Combinational Logic:** Half Adder and Full Adder , Binary Adder- Subtractor, Decimal Adder, Comparator, Decoders, Encoders, Multiplexers.

**Unit-II**

**5. Synchronous Sequential Logic:** Sequential Circuits, Latches, Flip-Flops(SR,JK,JK Master Slave, D and T-type). Negative edge and Positive edge triggered clocks

**6. Registers and Counters:** Shift Registers:(Serial-in Serial-out, Serial-in Parallel-out, Parallel-in Serial-out, Parallel-in Parallel-out), Ripple Counters, Synchronous and Asynchronous Counters, Mod counters up/down counters.

**7. Memory and Programmable Logic:** Introduction, Random-Access Memory, Memory Decoding, Error Detection and Correction, Read-Only Memory, Programmable Array Logic.

**References:**

1. Integrated Electronics by Millman, Halkias McGraw Hill.
2. Malvino: Digital Computer Electronics, McGraw Hill.
3. D.A. Hodges & H.G. Jackson, Analysis and Design of Integrated Circuits, International, 1983.
4. Joph. F. Wakerley, Digital Principles and Practices.
5. Ujjenbeck, John: Digital Electronics: A Modern Approach, Prentice Hall, 1994.
6. Mano, M. Morris: Digital Logic and Computer Design, Edition, 1993
7. Electronics by R.K Gaur



## B.Sc. (Information Technology) Semester – II

### Paper–IV: Introduction to Programming - C++

**Time: 3 Hours**

**Max. Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment Marks: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

#### UNIT-I

1. **Getting Started** : Introduction, A brief history of C++, Variables , constants, Expression, Statements, Comments and keywords of C++, Operators in C++: Arithmetic, Relational, Logical, Assignment, Increment/Decrement, Conditional, Precedence of Operators , Data type, Type Conversion, library function.

2. **Input / Output Statements** : Inputting using in and outputting using cout statements. Preprocessor directives, Basic program construction. A Complete C++ Program: Invoking Turbo C++, naming your program, using the editor, saving your program, compiling and linking, running the program. Errors : Compiler, linker and runtime. Other IDE Features: Compiling and linking shortcut exiting from IDE, examining files, opening an existing file, DOS shell

3. **Decision Making and Looping Statement** : If Statement, If-else statement, nesting of if statement, switch statement, conditional operator statement.

While loop, do loop, for loop, nesting of loops, break and continue statement, go to statement.

4. **Arrays** : Defining an array, array type, array elements, Accessing and initializing elements of array, Programming of C++ with array, String handling, array of strings.

#### UNIT-II

5. **Functions** : Definition of function, Declaring function, Local, global variables, execution of function, Passing argument to function, Return values Reference arguments, Overloading functions, Inline function, friend function and default parameter., Storage classes.

6. **Structures**: A simple structure, specifying the structure, defining a structure variable, Accessing Structure member, Other structure features. Structure within structure. Structure and classes. Array of structures.

7. **Object Oriented Programming** Objects & Classes, Constructor & Destructor, Operator overloading: Overloading unary operators, Overloading binary operators, Data conversion, Pitfalls operator overloading and conversion.

**8. Inheritance** Derived class and Base Class, Derived Class Constructors, Overriding member functions, Inheritance in the English distances class, class hierarchies, Public and Private Inheritance, Level of inheritance.

**9. Polymorphism:** Problems with single inheritance, Multiple inheritance, Virtual Functions, Pure Virtual Functions.

**References:**

1. C++ & Graphics by Vijay Mukhi's
2. Turbo C++ by Robert Lafore.
3. C++ Programming Language by Schaum's outline series.
4. Object –Oriented Programming with C++ by E. Balagursamy, 2017 edition.
5. C++, The Complete Reference by Herbert Schildt.

## B.Sc. (Information Technology) Semester – II

### Paper – V: Numerical Methods and Statistical Techniques

**Time: 3 Hours**

**Total Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment M: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

### UNIT-I

#### **Introduction:**

1. Numerical Methods, Numerical methods versus numerical analysis, Errors and Measures of Errors.
2. Non-linear Equations, iterative Solutions, Multiple roots and other difficulties, Interpolation methods, Methods of bi-section, False position method, Newton Raphson – method.
3. Simultaneous Solution of Equations, Gauss Elimination Method, Gauss Jordan Method
4. Numerical Integration and different Trapezoidal Rule, Simpson's 3/8 Rule.
- 5 Interpolation and Curve Fitting, Lagrangian Polynomials, Newton's Methods: Forward Difference Method, Backward Difference Method Divided Difference Method.
- 6 Least square fit linear trend, Non-linear trend.

$$Y = ax^b$$

$$Y = ab^x$$

$$Y = ae^x$$

$$\text{Polynomial fit: } Y = a+bx+cx^2$$

### UNIT-II

#### **Statistical Techniques:**

1. Measure of Central Tendency, Mean Arithmetic, Mean Geometric, Mean Harmonic, Mean, Median, Mode.
2. Measure of Dispersion, Mean Deviation, Standard Deviation, Co-efficient of Variation.

#### **Books Recommended:**

1. V. Rajaraman: Computer Oriented Numerical Methods, Prentice Hall of India Private Ltd., New Delhi.
2. B.S. Grewal, Numerical Methods for Engineering, Sultan Chand Publication.
3. V. Rajaraman: Computer Oriented Numerical Methods, Prentice Hall of India Private Ltd., New Delhi.
4. S.P Gupta, Statistical Methods, Sultan Chand & Sons Publications.

**B.Sc. (Information Technology) Semester – II**

**Paper–VI: Programming Lab- I (C++ Programming Language)**

**Total Marks: 75**

**Practical Marks: 56**

**Practical Internal Assessment M: 19**

**Practical-** Implementation of Numerical Methods and Statistical Techniques Using C++.

## **B.Sc. (Information Technology) Semester – II**

### **Paper VII: DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION DRUG ABUSE: MANAGEMENT AND PREVENTION (Compulsory Paper)**

**Time: 3 Hours**

**Max. Marks: 50  
Theory Marks: 37  
Internal assessment: 13**

#### **Instructions for the Paper Setters:**

Section–A: (09 Marks): It will consist of five short answer type questions. Candidates will be required to attempt three questions, each question carrying 03 marks. Answer to any of the questions should not exceed two pages.

Section–B: (16 Marks) It will consist of four essay type questions. Candidates will be required to attempt two questions, each question carrying 08 marks. Answer to any of the questions should not exceed four pages.

Section–C: (12 Marks) It will consist of two questions. Candidate will be required to attempt one question only. Answer to the question should not exceed 5 pages.

#### **UNIT-I**

- **Prevention of Drug abuse**

Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.

#### **UNIT-II**

- School: Counseling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

#### **UNIT-III**

- **Controlling Drug Abuse**

Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program

#### **UNIT-IV**

- Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

#### **References:**

1. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
2. Gandotra, R. and Randhawa, J.K. 2018. *voZrI d[otos'A (BPky'oh) gqpzXB ns o'eEkw*. Kasturi Lal & Sons, Educational Publishers, Amritsar- Jalandhar.

3. Inciardi, J.A. 1981. *The Drug Crime Connection*. Beverly Hills: Sage Publications.
4. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
5. Randhawa, J.K. and Randhawa, Samreet 2018. *Drug Abuse-Management and Prevention*. Kasturi Lal & Sons, Educational Publishers, Amritsar- Jalandhar.
6. Sain, Bhim 1991, *Drug Addiction Alcoholism, Smoking obscenity* New Delhi: Mittal Publications.
7. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab: A Sociological Study*. Amritsar: Guru Nanak Dev University.
8. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
9. *World Drug Report 2011*, United Nations office of Drug and Crime.
10. *World Drug Report 2010*, United Nations office of Drug and Crime

# B.Sc. (Information Technology)

## Semester-III

Sr. No.	Paper Code	Paper Name	Marks				Page No.
			Theory	Internal Assessment	Practical	Total	
1	Paper-I	Introduction to Python	56	19	-	75	149
2	Paper-II	Data Structure	56	19	-	75	150
3	Paper-III	System Analysis & Design	56	19	-	75	151
4	Paper-IV	Environment Studies – I (Compulsory)	37	13	-	50	152-153
5	Paper-V	Programming Lab-I (Python Programming Language)	-	13	37	50	154
6	Paper-VI	Programming Lab – II (Data Structure)	-	07	18	25	155

## B.Sc. (Information Technology) Semester – III

### Paper I: Introduction to Python

**Time: 3 Hours**

**Max. Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment Marks: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

#### UNIT-I

**Introduction to Python:** Process of Computational Problem Solving, Python Programming Language

**Data and Expressions:** Literals, Variables and Identifiers, Operators, Expressions, Statements and Data Types

**Control Structures:** Boolean Expressions (Conditions), Logical Operators, Selection Control, Nested conditions, Debugging

**Lists:** List Structures, Lists (Sequences) in Python, Iterating Over Lists (Sequences) in Python

**Functions:** Fundamental Concepts, Program Routines, Flow of Execution, Parameters & Arguments

**Iteration:** While statement, Definite loops using For, Loop Patterns, Recursive Functions, Recursive Problem Solving, Iteration vs. Recursion

#### UNIT-II

**Dictionaries:** Dictionaries and Files, Looping and dictionaries, Advanced text parsing

**Files:** Opening Files, Using Text Files, String Processing, Exception Handling

**Objects and Their Use:** Introduction to Object Oriented Programming

**Modular Design:** Modules, Top-Down Design, Python Modules

**Using Databases and SQL:** Database Concepts, SQLite Manager Firefox Add-on, SQL basic summary, Basic Data modeling, Programming with multiple tables

#### **Reference Books:**

1. Python for Informatics, Charles Severance, version 0.0.7
2. Introduction to Computer Science Using Python: A Computational Problem-Solving Focus, Charles Dierbach, Wiley Publications, 2012, ISBN : 978-0-470-91204-1
3. Introduction To Computation And Programming Using Python, GUTTAG JOHN V, PHI, 2014, ISBN-13: 978-8120348660
4. Introduction to Computing & Problem Solving Through Python, Jeeva Jose and Sojan P. Lal, Khanna Publishers, 2015, ISBN-13: 978-9382609810
5. Introduction to Computing and Programming in Python, Mark J. Guzdial, Pearson Education, 2015, ISBN-13: 978-9332556591
6. Fundamentals of Python by Kenneth Lambert, Course Technology, Cengage Learning, 2015
7. Learning Python by Mark Lutz, 5th Edition, O'Reilly Media, 2013



## B.Sc. (Information Technology) Semester – III

### Paper – II: Data Structure

**Time: 3 Hours**

**Max. Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment Marks: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

#### UNIT-I

**Basic Data Structure:** Introduction to elementary Data Organization, Common Operation on Data Structures, Algorithm Complexity, Big O Notation, Time – Space tradeoff between Algorithms.

**Arrays:** Array Defined, Representing Arrays in Memory, Various Operations on Linear Arrays, Multidimensional Arrays.

**Linked Lists:** Types of Linked Lists, Representing Linked Lists in Memory, Advantages of using Linked Lists over Arrays, Various Operations on Linked Lists.

**Stacks:** Description of STACK structure, Implementation of Stack using Arrays and Linked Lists, Applications of Stacks – Converting Arithmetic expression from infix notation to polish and their subsequent evaluation, Quicksort Technique to sort an array.

#### UNIT-II

**Queues:** Description of queue structure, Implementation of queue using arrays and linked lists, Description of priorities of queues, Dequeues.

**Trees:** Description of Tree Structure and its Terminology, Binary Trees and Binary Search Trees and their representation in Memory

**Sorting and Searching:** Sorting Algorithms, Bubble Sort, Searching Algorithms, Linear Search and Binary Search.

**Graphs:** Description of Graph Structure, Implement Graphs in Memory using Adjacency Matrix, Path Matrix.

**References:**

1. Seymour Lipschutz, Theory and Problems of Data Structures, Schaum's Outline Series, McGraw Hill Company.
2. Tanenbaum, Data Structure using C.
3. Data Structure and Algorithms by Alfred V. John E. Hopcroft, Jeffery D. Ullman Pearson.
4. Sorenson and Trembley, "An Introduction to Data Structure with Applications, McGraw Hill, 2006 edition.

## B.Sc. (Information Technology) Semester – III

### Paper – III: System Analysis & Design

**Time: 3 Hours**

**Max. Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment Marks: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

#### UNIT-I

**System Planning and Analysis:** Introduction to systems development life cycle and role of different stages. Requirement analysis, Problem definition, Feasibility Study and its importance. Information Gathering Tools, Cost Benefit Analysis, Role and responsibilities of System Analyst.

**System Design:** Input/Output Design, Modular and Structured Design, Tools for structured design(Data Flow Diagrams, Data Dictionary, Decision Tree, Structured English and Decision Tables) and system design considerations.

#### UNIT-II

**System Implementation:** System testing, Quality assurance, Documentation tools, Managing system implementation.

**System Testing:** Introduction to testing and its types

**System Maintenance:** Concept of maintenance and its importance, types of maintenance

#### References:

1. "Elements of System Analysis" – Marvin Gore and John W. Stubbe, 2003.
2. "System Analysis and Design" – Thapliyal M.P., 2002.
3. "Modern Systems Analysis & Design" – Hoffer, George and Valacich, 2001.
4. "SSAD: System Software Analysis and Design" – Mehta Subhash and Bangia Ramesh, 1998.
5. "Understanding Dynamic System : Approaches to Modelling, Analysis and Design" –Dorny C. Nelson, 1993.
6. "System Analysis and Design" – Perry Edwards, 1993.
7. "Systems Analysis and Design" – Elias M. Awad, 1993.
8. "Analysis and Design of Information Systems" – James A. Senn, 1989.

**B.Sc. (Information Technology) Semester – III**  
**ESL–221: ENVIRONMENTAL STUDIES–I (COMPULSORY)**

**Time: 3 Hrs.**

**Theory Lectures: 1½ Hours/ Week**

**Max. Marks: 50**

**Theory Marks: 37**

**Internal Assessment.: 13**

**Instructions for Paper Setters:** The question paper will consist of three sections. Candidate will be required to attempt all the sections. Each unit of the syllabus should be given equal weightage of marks. Paper to be set in English, Punjabi and Hindi.

**Section–A: (16 Marks):** It will consist of five short answer type questions. Candidates will be required to attempt four questions, each question carrying four marks. Answer to any of the questions should not exceed two pages.

**Section–B: (24 Marks):** It will consist of five questions. Candidates will be required to attempt four questions, each question carrying six marks. Answer to any of the questions should not exceed four pages.

**Section–C: (10 Marks):** It will consist of two questions. Candidate will be required to attempt one question (carrying ten marks) only. Answer to the question should not exceed 5 pages.

### Unit-I

**The Multidisciplinary Nature of Environmental Studies:**

- Definition, scope & its importance.
- Need for public awareness.

**Natural Resources:**

- Natural resources and associated problems:

**a) Forest Resources:** Use of over exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

**b) Water Resources:** Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

**c) Mineral Resources:** Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

**d) Food Resources:** World food problems, change caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problem, salinity, case studies.

**e) Energy Resources:** Growing of energy needs, renewable and non-renewable energy resources, use of alternate energy sources, case studies.

**f) Land Resources:** Land as a resource, land degradation, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

### Unit-II

**Ecosystem:**

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.

Introduction, types, characteristic features, structure and function of the following ecosystems:

Forest ecosystem

b. Grassland ecosystem

c. Desert ecosystem

d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

### Unit-III

#### Social Issues and Environment:

From unsustainable to sustainable development.

Urban problems related to energy.

Water conservation, rain water harvesting, watershed management.

Resettlement and rehabilitation of people; its problems and concerns. Case studies.

Environmental ethics: Issues and possible solutions.

Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.

Wasteland reclamation.

Consumerism and waste products.

Environmental Protection Act:

- Air (prevention and Control of Pollution) Act.
- Water (prevention and Control of Pollution) Act.
- Wildlife Protection Act.
- Forest Conservation Act.

Issues involved in enforcement of environmental legislation.

Public awareness.

### Unit-IV

#### National Service Scheme

- **Introduction and Basic Concepts of NSS:** History, philosophy, aims & objectives of NSS; Emblem, flag, motto, song, badge etc.; Organizational structure, roles and responsibilities of various NSS functionaries.
- **Health, Hygiene & Sanitation:** Definition, needs and scope of health education; Food and Nutrition; Safe drinking water, water borne diseases and sanitation (Swachh Bharat Abhiyan); National Health Programme; Reproductive health.

#### References/Books:

1. Agarwal, K. C. 2001. Environmental Biology, Nidhi Publications Ltd. Bikaner.
2. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
3. Down to Earth, Centre for Science and Environment, New Delhi.
4. Jadhav, H. & Bhosale, V. M. 1995. Environmental Protection and Laws. Himalaya Pub.
5. Joseph, K. and Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.
6. Kaushik, A. & Kaushik, C. P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.
7. Miller, T. G. Jr. 2000. Environmental Science, Wadsworth Publishing Co.
8. Sharma, P. D. 2005. Ecology and Environment, Rastogi Publications, Meerut.
9. Booklet on Safe Driving. Sukhmani Society (Suvidha Centre), District Court Complex, Amritsar
10. Kanta, S., 2012. Essentials of Environmental Studies, ABS Publications, Jalandhar.

**B.Sc. (Information Technology) Semester – III**

**Paper – V  
(Programming Lab-I)**

**Max. Marks: 50**

**Practical Marks: 37**

**Practical Internal Assessment Marks: 13**

**Lab – I:           Based on Python, Programming Language**

**B.Sc. (Information Technology) Semester – III**

**Paper – VI**

**Programming Lab-II (Data Structure)**

**Lab – II:                    Data Structure**

**Max. Marks: 25**

**Practical Marks: 18**

**Practical Internal Assessment Marks: 07**

# B.Sc. (Information Technology)

## Semester-IV

Sr. No.	Paper Code	Paper Name	Marks				Page No.
			Theory	Internal Assessment	Practical	Total	
1	Paper-I	Database Management System	56	19	-	75	157
2	Paper-II	Computer Architecture	56	19	-	75	158
3	Paper-III	Java Programming	56	19	-	75	159
4	Paper-IV	Environment Studies – II (Compulsory)	37	13	-	50	160-161
5	Paper-V	Compiler Design	56	19	-	75	162
6	Paper-VI	Programming Lab – I (Oracle)	-	13	37	50	163
7	Paper-VII	Programming Lab – II ( Java )	-	13	37	50	164

**Note:**

1. All the students are required to undergo 'Industrial Training' for 6 weeks in IT Companies after 4th semester final examinations. Final degree to the students will be awarded subject to their successfully completing the 'Industrial Training'.
2. 'Industrial Training' will be evaluated as satisfactory / unsatisfactory internally by the department.
3. Last date for submission of training Report within 1 Week after coming from training.
4. Marks of Paper EVS will not be included in Grand Total.

**B.Sc. Information Technology) Semester – IV**  
**Paper – I: Database Management System**

**Time: 3 Hours**

**Max. Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment Marks: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

### UNIT-I

Introduction to data, field, record, file, database, database management system. Structure of database system, Advantage and disadvantage, levels of database system, Relational model, hierarchical model, network model, comparison of these models, E–R diagram, different keys used in a relational system, SQL.DBA, responsibilities of DBA, Relational form like 1NF, 2NF, 3NF, BCNF, 4<sup>th</sup> NF, 5<sup>th</sup> NF, DBTG, concurrency control and its management, protection, security, recovery of database.

### UNIT-II

**SQL:** Introduction to SQL–DDL, DML, DCL, Join methods & sub query, Union Intersection, Minus, Tree Walking, Built in Functions, Views, Security amongst users, Sequences, Indexing Cursors– Implicit & Explicit, Procedures, Functions & Packages Database Triggers.

**Big Data:** Introduction to Big Data and Analytics, Introduction to NoSQL

Introductory knowledge and classification of NoSQL databases based upon Column (HBase), Document (MongoDB), Keyvalue (Oracle NoSQL database), Graph, Multimodel and their query languages.

#### **Books and References:**

1. Introduction to Database System By C.J. Date.
2. Database Management System By B.C. Desai.
3. Database Concept by Korth.
4. Simplified Approach to DBMS– Kalyani Publishers
5. Oracle – Developer – 2000 by Ivan Bayross.
6. Database System concepts & Oracle (SQL/PLSQ) – AP Publishers.
7. <https://www.mongodb.com/nosql-explained>
8. Introduction to NoSQL (Ebook), NoSQL Seminar 2012 @ TUT, Arto Salminen



## B.Sc. (Information Technology) Semester – IV

### Paper – II: Computer Architecture

**Time: 3 Hours**

**Max. Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment Marks: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

#### UNIT-I

**Information Representation :** Register Transfer, Various Registers, Implementing Common Bus Using Multiplexers: Logical; Arithmetic & Shift Micro – operations.

**Basic Computer Design** Instruction Codes, Interfacing various Registers, Computer Instructions, Timing Signals, Instruction Cycle, Design of a Basic Computer.

**CPU Design** Stack Organized CPU, Instruction Formats, Addressing Modes.

#### UNIT-II

**CPU Design** Program Control, Hardwired & Micro-programmed (Wilhe’s Design) Control Unit.

**Memory Organization** Memory Hierarchy, Designs & Concepts of Main Memory, Auxiliary Memory, Associative Memory, Cache and Virtual Memory.

**I/O Organization** I/O Interface, Modes of Transfer, Program Interrupt, DMA & I/O Processor.

**Pipeline & Vector Processing** Parallel Processing Pipelining, Parallel & Distributed Computers, SISD, SIMD & MISD, MIMD Machines, Vector Processing.

#### References:

- 1.Computer System Architecture: M.M. Mano (PHI).
- 2.Computer Architecture: J.P. Hayes.
- 3.Computer Architecture: Patterson & Hemessy.
- 4.Computer Organization and Architecture by William Stallings.
5. Computer Systems Design and Architecture “by Vincent P Heuring and Harry F Jordan.

## B.Sc. (Information Technology) Semester – IV

### Paper – III: JAVA PROGRAMMING

**Time: 3 Hours**

**Max. Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment Marks: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

#### UNIT-I

**Introduction to Concepts of Programming:** . Introduction to Java, JVM, Features of java, JDK Environment & tools like(java, javac, applet viewer, javadoc, jdb)

**Introduction to Java:** Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch), Looping(for, while) , Type Casting

**Classes and Objects:** Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance (Simple, Multilevel, Hierarchical), Implementation of Polymorphism (Method Overloading , Method Overriding), Nested and Inner classes

**Arrays String and Vector :** Arrays, Creating an array, Types of Array (One Dimensional arrays, Two Dimensional array ),Strings, String – Arrays, String Methods, String Buffer class, Vectors , Wrapper classes

**Abstract Class :** Interface and Packages , Modifiers and Access Control (Default, public private protected ), Abstract classes and methods

#### UNIT-II

**Interfaces and Packages :** (Packages Concept , Creating user defined packages , Java Built in packages , Java.lang->math , Java.util->Random, Date, Hash Table)

**Multithreading:** Creating Threads using Different methods, Thread Priorities, Thread Synchronization, Inter process thread Communication.

**Exception Handling :** Exception types , Using try catch and Multiple catch , Nested try , throw , throws and finally , Creating User defined Exceptions

**File Handling :** Byte Stream , character stream , file IO Basics ,File Operations(Creating file, Reading file(Character, byte), Writing File (Character, byte)).

**References:**

1. “Java–The Complete Reference”, Herbert Schildt, Tata MacGraw Hill.
2. “Introduction to Java Programming”, Y. Daniel Mliang, Pearsons Publications.
3. Programming with JAVA - E Balgurusamy
4. JAVA:How to Programm- Paul Deital and Harvey Deital.

**B.Sc. (Information Technology) Semester – IV**  
**ESL–222: ENVIRONMENTAL STUDIES–II (COMPULSORY)**

**Time: 3 Hrs.**

**Max. Marks: 50**

**Theory Lectures: 1½ Hours/ Week**

**Theory Marks: 37; Int ass.: 13**

**Instructions for Paper Setters:** The question paper will consist of three sections. Candidate will be required to attempt all the sections. Each unit of the syllabus should be given equal weightage of marks. Paper to be set in English, Punjabi and Hindi.

**Section–A: (16 Marks):** It will consist of five short answer type questions. Candidates will be required to attempt four questions, each question carrying four marks. Answer to any of the questions should not exceed two pages.

**Section–B: (24 Marks):** It will consist of five questions. Candidates will be required to attempt four questions, each question carrying six marks. Answer to any of the questions should not exceed four pages.

**Section–C: (10 Marks):** It will consist of two questions. Candidate will be required to attempt one question (carrying ten marks) only. Answer to the question should not exceed 5 pages.

**Unit-I**

**Biodiversity and its Conservation:**

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

**Unit-II**

**Environmental Pollution:**

- Definition, causes, effects and control measures of:
  - a) Air Pollution
  - b) Water Pollution
  - c) Soil Pollution
  - d) Marine Pollution
  - e) Noise Pollution
  - f) Thermal Pollution
  - g) Nuclear Hazards
  - h) Electronic Waste
- Solid Waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster Management: Floods, Earthquake, Cyclone and Landslides.

### Unit-III

#### Human Population and the Environment

- Population growth, variation among nations.
- Population explosion-Family welfare programme.
- Environment and human health.
- Human rights.
- Value education.
- HIV/AIDS.
- Women and child welfare.
- Role of information technology in environment and human health.
- Case studies.
- Road Safety Rules & Regulations: Use of Safety Devices while Driving, Do's and Don'ts while Driving, Role of Citizens or Public Participation, Responsibilities of Public under Motor Vehicle Act, 1988, General Traffic Signs.
- Accident & First Aid: First Aid to Road Accident Victims, Calling Patrolling Police & Ambulance.

### Unit-IV

#### National Service Scheme:

- **Entrepreneurship Development:** Definition & Meaning; Qualities of good entrepreneur; Steps/ ways in opening an enterprise; Role of financial and support service Institutions.
- **Civil/Self Defense:** Civil defense services, aims and objectives of civil defense; Needs for self-defense training.

#### Field Visits:

- Visit to a local area to document environmental assets—river/forest/grassland/hill/ mountain.
- Visit to a local polluted site—Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystems—pond, river, hill slopes etc.
- Contribution of the student to NSS/any other social cause for service of society.

**Note:** In this section the students will be required to visit and write on the environment of an area/ ecosystem/village industry/disaster/mine/dam/agriculture field/waste management/hospital etc. with its salient features, limitations, their implications and suggestion for improvement.

#### References/Books:

1. Agarwal, K. C. 2001. Environmental Biology, Nidhi Publications Ltd. Bikaner.
2. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
3. Down to Earth, Centre for Science and Environment, New Delhi.
4. Jadhav, H. & Bhosale, V. M. 1995. Environmental Protection and Laws. Himalaya Pub.
5. Joseph, K. and Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.
6. Kaushik, A. & Kaushik, C. P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.
7. Miller, T. G. Jr. 2000. Environmental Science, Wadsworth Publishing Co.
8. Sharma, P. D. 2005. Ecology and Environment, Rastogi Publications, Meerut.
9. Booklet on Safe Driving. Sukhmani Society (Suvidha Centre), District Court Complex, Amritsar
10. Kanta, S., 2012. Essentials of Environmental Studies, ABS Publications, Jalandhar.

## B.Sc. (Information Technology) Semester – IV

### Paper – V: Compiler Design

**Time: 3 Hours**

**Max. Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment Marks: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks. The total weightage of this section shall be **22 marks**.

#### UNIT-I

Basics of Compilers and different phases of compiler design

Detailed study of Lexical Analysis and Syntax Analysis

#### **Storage Management**

Static Storage Management, Dynamic Storage Management.

#### **Symbol Table Handling**

Symbol table contents, operations on Symbol Tables, Organizations of Symbol Tables.

**Intermediate Code Generation:** Three address Code (Triples, Quadruples).

#### UNIT-II

#### **Code Generation**

Code Generator, Code generation of simple programming constructs.

#### **Code Optimization**

Local optimization, global optimization, loop optimization

**Types of Compiler-**Incremental compilers and Cross Compilers.

#### **References:**

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman: *Compiler, Principles, Techniques and Tools*, Addison Wesley, 2006.
2. Tremblay J.P., Sorenson P.G., *The Theory and Practice of Compiler Writing*, Mc-Graw Hill, 2007.
3. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman: *Principles of Compiler Design*, Narosa Publishing House, 2007.
- 4.S.Malathi, K.Kiruthika, C. Jackulin, *Compiler Design*, Ane Books Pvt. Ltd.

**B.Sc. (Information Technology) Semester – IV**

**Paper – VI  
Programming Lab-I(Oracle)**

**Total Marks: 50  
Practical Marks: 37  
Practical Internal Assessment M:13**

**Lab – I: Oracle**

**B.Sc. (Information Technology) Semester – IV**

**Paper – VII**  
**Programming Lab-II (JAVA)**

**2Total Marks: 50**  
**Practical Marks: 37**  
**Practical Internal Assessment M: 13**

**Lab – II: Java**

# B.Sc. (Information Technology)

## Semester-V

Sr. No.	Paper Code	Paper Name	Marks				Page No.
			Theory	Practical	Internal Assessment	Total Marks	
1	Paper-I	Computer Networks	75	-	25	100	166
2	Paper-II	Operating System	75	-	25	100	167
3	Paper-III	Web Development using PHP	56	-	19	75	168-169
4	Paper-IV	Lab – I Computer Networks and Operating System	-	56	19	75	170
5	Paper-V	Lab – II PHP	-	37	13	50	171



## B.Sc. (Information Technology) Semester – V

### Paper – I: Computer Networks

**Time: 3 Hrs.**

**Total Marks: 100**

**Theory Marks: 75**

**Theory Internal Assessment M: 25**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry **2.5 marks** with answer to each question up to 10 lines in length. The total weightage being **15 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry **15 marks**.

The total weightage of this section shall be **30 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry **15 marks**.

The total weightage of this section shall be **30 marks**.

#### UNIT – I

Basic concepts of Computer

Networks, Client Server Network topologies. OSI Reference Model, TCP/IP Model Comparison and Critiques, Concepts of Routers, bridges, Repeaters, Gateways.

**Data Transmission:** – Analog & Digital Transmission, Modem, Codec, Pulse Code Modulation Multiplexing, Circuit Switching, Packet Switching, message Switching, Hybrid Switching.

#### UNIT – II

**Transmission Media:** – Twisted Pair, Co-axial Cable, Baseband, Broadband, Fibre optics, Satellite, Wireless Transmission, Telephone System

**The Data link Layer:** Design Issues, Error Detection and Correction, Data Link Sliding Window Protocols.

IEEE Standard 802 for LAN's and MAN's Routing Algorithm.

Internetworking, Network Security.

#### **References:**

1. Tanenbaum A.S. 'Computer Network', PHI.
2. Stalings W., 'Data and Computer Communications', PHI.
3. Data Communication and Networking by Behrouz A Forouzan.
4. Stallings W. , Local Network: An Introduction Macmillan Publishing Co.

## B.Sc. (Information Technology) Semester – V

### Paper – II: Operating System

**Time: 3 Hrs.**

**Total Marks: 100**

**Theory Marks: 75**

**Theory Internal Assessment M: 25**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry **2.5 marks** with answer to each question up to 10 lines in length. The total weightage being **15 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry **15 marks**.

The total weightage of this section shall be **30 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry **15 marks**.

The total weightage of this section shall be **30 marks**.

#### UNIT – I

##### **Introduction:**

Definition, evolution, need, early system, function, buffering spooling, single user, multiuser, multiprogramming, multiprocessing, multitasking, multithreading, batch processing, real time, time systems, time sharing systems, security, protection.

##### **Processor Management / CPU Scheduling:**

CPU – I/O Basic Cycle, process state, process control block, Scheduling, Queue, Schedulers, Scheduling Algorithms, Performance criteria, FCFS, SJF, Priority, SRTF, Round Robin, Multi – Levels users Algorithm.

##### **Deadlocks:**

Definition, Necessary condition for deadlock, Deadlock Prevention Mutual exclusion, Hold and wait, No pre-emption, circular wait Banker's algorithms, Recovery from deadlock, semaphores.

#### UNIT – II

##### **Memory Management:**

Concept of Relocation, Swapping, backing storage, swap time, MFT, MFT job scheduling, region size selection, memory fragmentation, MVT, MVT job scheduling compaction, paging, segmentation.

##### **Virtual Memory:**

Overlays, demand paging, page fault, performance of demand paging, page replacement, page replacement algorithm, FIFO, Optimal page replacement, Thrashing.

##### **Device Management:**

I/O and device management physical characteristics, FCFS, SSTF, SCAN, CSCAN.

##### **File Management:**

Disk and File Management.

##### **References:**

1. "Operating System Concepts", Fourth Edition by Silberschatz Galvin Addison Wesley.
2. "Operating Systems: A Design Oriented Approach" by Crowley, Published by Tata McGraw Hill.
3. "Operating Systems" Second Edition by Dietel, Addison Wesley.
4. Madnick & Donovan: Operating System, McGraw Hill
5. A.C. Shaw: Logic Design of Operating System, Prentice Hall.

## B.Sc. (Information Technology) Semester – V

### Paper – III: Web Development using PHP

**Time: 3 Hours**

**Max. Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment Marks: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

#### UNIT-I

**Introduction to PHP:** Introduction to PHP, History & Future Scope of PHP, Benefit & Importance of PHP, Installation of tools for working in PHP like XAMPP, WAMP for PHP, Apache & MySQL.

**Introduction to Language constructs :** Variables, constants, PHP's inbuilt data types  
Keywords, Comments, Operators & Expressions : Arithmetic, Assignment, Comparison, Logical Operators, String & echo, print for outputting in web page: string functions, Using Loop Statement like for, for each, do while, while, switch, goto, and continue.

**Working with flow control through Control Statement:** if-else, if-else ladder

**Arrays:** Introduction to Array, Simple array declaration, use of array, Numeric Array, Associative Array, Multidimensional Array, Array Functions, explode & implode functions

**PHP Functions:** Defining User functions, Passing parameter & return value, Use of Math functions, String functions, Date & time function, Date formats, Include, Require.FORM:GET/POST/REQUEST, Using html controls in web page, Master/Child Page concept.

**State Management:** Using Session in web pages for user authentication, Using Cookies in web pages for user authentication.

#### UNIT-II

**Object Oriented Programming::**Classes, Object & Constructor & Destructor, Using Access Specifier, Inheritance, Overloading.

**Java Script:** Syntax, Comments, Variables, Operators, Data Types, Function, Object, Condition, Looping, Form Validation.

**Jquery:** Syntax, selectors, Events, effects, JQuery CSS Classes.

**Ajax:** Ajax introduction, XML Http, Request, Response, Event, PHP.

**Introduction to MySQL:** Logging on to MySql, Creating a Database, Creating a Table, Inserting Data into a table, Viewing stored Data, Modifying Stored data, Deleting Stored Data.

**Connecting to MySQL with PHP:** Sending SQL Queries with PHP. Submitting & showing data to/from web controls from/to database, Uploading files to server/ upload form /upload script, Sending emails/ email script

**References:**

1. PHP and MYSQL web development (4th Edition).
2. PHP for Beginners by Ivan Bross.
2. PHP: The Complete Reference by Steven Holzner
3. PHP Pocket Reference by PHP Pocket Reference.
4. PHP and MySQL Web Development by Laura Thomson and Luke Welling
5. Head First Php & MySQL By by Beighley

**B.Sc. (Information Technology) Semester – V**

**Paper – IV**

**Lab I (Computer Networks and Operating System)**

**Time: 3 Hours**

**Total Marks: 75**

**Practical Marks: 56**

**Practical Internal Assessment M: 19**

**Practical Lab: Computer Networks and Operating System**

**B.Sc. (Information Technology) Semester – V**

**Paper – V**  
**Lab II (PHP)**

**Time: 3 Hours**

**Total Marks: 50**

**Practical Marks: 37**

**Practical Internal Assessment M: 13**

**Practical Lab: PHP**

# B.Sc. (Information Technology)

## Semester-VI

Sr. No.	Paper No.	Paper	Marks				Page No.
			Theory	Practical	Internal Assessment	Total	
1	Paper-I	Computer Graphics	56	-	19	75	173
2	Paper-II	Internet Applications and E-Business	75		25	100	174-175
3	Paper-III	Lab (Applications of Computer Graphics in C/C++ and HTML )	-	18	07	25	183
3	Paper-IV	Project	-	150	50	200	184

## B.Sc. (Information Technology) Semester – VI

### Paper – I: Computer Graphics

**Time: 3 Hours**

**Max. Marks: 75**

**Theory Marks: 56**

**Theory Internal Assessment Marks: 19**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.

The total weightage of this section shall be **22 marks**.

#### UNIT-I

##### **Preliminaries**

Basics of Computer Graphics, Computer graphics Hardware and Software.

##### **2D Primitives**

Line drawing, circle drawing and simple line clipping algorithms.

##### **2D-Transformations**

Simple 2D- Transformations and their different representations, composite Transformations 2D-

#### UNIT-II

##### **3D-Transformations**

Simple 3D-Transformations, composite 3D-Transformations.

##### **Hidden Surfaces**

Depth comparisons, Z-buffer algorithm, Scan line algorithms.

Projections

Parallel Projections, Perspective Projections, Oblique Projections.

##### **References:**

1. Donald Hearn & M. Pauline Baker, 'Computer Graphics', Printice Hall of India Private Limited, 2008.
2. Foley, A. Van Dam. S. Feiner, and J. Hughes, 'Computer Graphics: Principles and Practice', Addison-Wesley, 2006.
3. David F. Rogers, 'Procedural Elements for Computer Graphics', McGraw Hill Book Company, 2006.
4. Roy A. Plastick & Cordon Kalley, 'Computer Graphics', McGraw Hill Book Company, 2007.



## **B.Sc. (Information Technology)** **Semester – VI**

### **Paper – II: Internet Applications and E- Business**

**Time: 3 Hrs.**

**Total Marks: 100**

**Theory Marks: 75**

**Theory Internal Assessment M: 25**

**Note: The question paper covering the entire course shall be divided into three sections.**

**Section A:** It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry **2.5 marks** with answer to each question up to 10 lines in length. The total weightage being **15 marks**.

**Section B:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry **15 marks**.

The total weightage of this section shall be **30 marks**.

**Section C:** It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry **15 marks**.

The total weightage of this section shall be **30 marks**.

#### **UNIT-I**

**Introduction :** About internet and its working, business use of internet, services effect by internet, evaluation of Internet, Internet Service Provider (ISP), internet addressing (DNS) and IP addresses. E-Mail Basic Introduction, advantage and disadvantage, structure of an email message, working of e-mail (sending and receiving messages), managing email (creating new folder, deleting messages, forwarding messages, filtering messages, implementation of outlook express. Internet protocol Introduction, File transfer protocol (FTP), Gopher, Telnet, other protocols like HTTP and TCP/IP.

WWW introduction, working of WWW, Web browsing (opening, viewing, saving and printing a web page and bookmark), web designing using HTML, DHTML with programming techniques.

**E – Commerce:** Its definition, aims, process tools and results, EDI, VAN's and internet as Promoters, Types of E – Commerce, Commerce – net.

#### **UNIT-II**

##### **Steps to Start E – Commerce:**

H/W & S/W Requirements, steps involved in opening your own online business.

**EDI:** EDI Vs Traditional Systems, EDI enabled procurement process, components of EDI system, EDI implementation issues.

##### **Concerns for E – Commerce:**

Basic challenges to E – Commerce, Technological, legal and regulators heads, Internet Bandwidth & Technological Issues.

**NET:** Technical issues, standards & Services GII, Issues that confront us in relation to securing electronic transactions. Implementation of digital signatures. Authentication Mechanisms. Electronic cash, its elements, legal issues, risks, paper document versus Electronic document Laws for E – Commerce legal issues for Internet Commerce.

**References:**

1. "Understanding The Internet", Kieth Sutherland, Butterworth-Heinemann; 1st Edition (October 31, 2000).
2. "Internet Technologies", S. K. Bansal, APH Publishing Corporation (April 1, 2002).
3. "Data Communications and Networking", Behrouz A. Forouzan, 3rd Edition.
4. E – Commerce –The Cutting Edge of Business. By: Kamlesh K. Bajaj. Debjani Nag.

**B.Sc. (Information Technology) Semester – VI**

**Paper – III Lab (Applications of Computer Graphics in C/C++)**

**Time: 3 Hours**

**Total Marks: 25**

**Practical Marks: 18**

**Practical Internal Assessment : 07**

**Practical Lab: Applications of Computer Graphics in C++/C**

**B.Sc. (Information Technology) Semester – VI****Paper – IV: PROJECT**

**Max. Marks: 200**  
**Project Marks: 150**  
**Internal Assessment: 50**

**General Instructions:**

1. A software module based on the work done in the entire course is to be developed.
2. The soft copy of the module shall be submitted to the College/Institute till April 30.
3. The software module shall be developed in groups, consisting of at most two students in a group.
4. The college shall depute guide(s)/supervisor(s) under whose supervision the software module shall be developed. The guide/supervisor shall clarify that the work done is original & authenticated. The certificate found to be incorrect at any stage shall attract the proceedings against all the stakeholders, as per the University rules.
5. The evaluation of the module shall be done as per the common ordinance of UG/PG w.e.f. 2012-2013 under semester system.
6. Training certificate of industrial training should be submitted to the College and also attached in the project.