FACULTY OF ENGINEERING & TECHNOLOGY

SYLLABUS

FOR

B.SC. (INFORMATION TECHNOLOGY)
(Semester: I–VI)

Session 2016-17

GURU NANAK DEV UNIVERSITY
AMRITSAR

B.Sc. (Information Technology)

SCHEME

SEMESTER – I:

Paper No.	Subjects	M. Marks
Paper – 1	Fundamentals of Computers	75
Paper – 2	C Programming Part – I	75
Paper – 3	Basic Mathematics & Statistics	75
Paper – 4	Communication Skills in English – I	50
Paper – 5	Punjabi / Basic Punjabi (Mudhli Punjabi) (Compulsory)	50
Paper – 6	Practical – PC Computing & C Language–I	75

SEMESTER – II:

Paper No.	Subjects	M. Marks
Paper – 1	Communication Skills in English – II (Th.35+Pr.15)	50
Paper – 2	Punjabi / Basic Punjabi (Mudhli Punjabi) (Compulsory)	50
Paper – 3	Principles of Digital Electronics	75
Paper – 4	C Programming Part – II	75
Paper – 5	Numerical Methods & Statistical Techniques	75
Paper – 6	Practical – C Language – II	75

SEMESTER – III:

Paper No.	Subjects	M. Marks
Paper – I	Object Oriented Programming Using C++	75
Paper – II	Data Structure	75
Paper – III	System Analysis & Design	75
Paper – IV	* Environmental Studies – I (Compulsory)	50
Paper – V	Programming Lab – I (C++, Programming Language)	50
Paper – VI	Programming Lab – II (Data Structure)	25

SEMESTER – IV:

Paper No.	Subjects	M. Marks
Paper – I	Database Management System & Oracle	75
Paper – II	Internet Applications	75
Paper – III	JAVA & Web Designing	75
Paper – IV	* Environmental Studies – II (Compulsory)	50
Paper – V	Compiler Design	75
Paper – VI	Programming Lab – I (Oracle)	50
Paper – VII	Programming Lab – II HTML & (JAVA)	50

* Marks of Paper EVS will not be included in Grand Total.

SEMESTER – V:

Paper No.	Subjects	M. Marks
Paper – I	Computer Networks	100
Paper – II	Operating System	100
Paper – III	E-Business	100
Paper – IV	Lab – I (Computer Networks)	50
Paper – V	Lab – II (Operating System)	50

SEMESTER – VI:		
Paper No.	**Subjects**	**M. Marks**
Paper – I & II: (Will be based on any of the two specialization options)	Option(I): Computer Graphics	
	Paper –I: Computer Graphics	75
	Paper –II: Applications of Computer Graphics in C++/C	25
	Option(II): Network Management	
	Paper –I: Network Operating System/Client Server Application	75
	Paper –II: Practical Lab based on NOS	25
Paper – III:	Project	300

B.Sc. (Information Technology) Semester – I

Paper – I: Fundamentals of Computers

Time: 3 Hours   **Max. Marks: 75**

Note: 1. Eight questions are required to be set giving equal weightage to all the units. The candidates will have to attempt any five. All questions carry equal marks.
2. The student can use only Non–programmable & Non–storage type Calculator.

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.

UNIT-II

2. 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.

UNIT-III

3. MS Word (Word for Windows):
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.

4. MS – PowerPoint:
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.

Text Books:

1. R.K. Taxali : Introduction to Software Packages, Galgotia Publicaions.

2. MS–Office 2003, Compiled by SYBIX.

3. MS–Office 2003, BPB Publications.

4. Introduction to Computer, P.K. Sinha.

Paper – II: C Programming Part – I

Time: 3 Hours   **Max. Marks: 75**

Note: 1. **Eight questions are required to be set giving equal weightage to all the units. The candidates will have to attempt any five.**
   2. **The student can use only Non–programmable & Non–storage type Calculator.**

UNIT-I

Logic Development Tools: Data Representation, Flow Charts, Problem Analysis, Decision Tree, Decision Table, Pseudo Code and Algorithm
Fundamentals: Character Set, Identifiers and Key Words, Data Types, Constants, Variables, Expressions, Statements, Symbolic Constants.

UNIT-II

Operators and Expressions: Arithmetic Operators, Unary Operators, Relational and logic Operators, Assignment and Conditional Operators, Library functions.

Data Input and Output: Preliminaries, single character Input, single character output, entering input data, more about scanf function, writing output data more about printf functions, gets and puts functions, interactive programming.

UNIT-III

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

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

Arrays: Defining and processing as array, passing array to a function, multi – dimensional arrays.

References:

1.   Programming in C   :   Schaum Outlines Series.

2. C Programming   :   Stephen G. Kochan.

3. Let Us C   :   Yashwant Kanitkar

B.Sc. (Information Technology) Semester – I

Paper – III: Basic Mathematics and Statistics

Time: 3 Hours   **Max. Marks: 75**

Note: 1. Eight questions are required to be set giving equal weightage to all the units. The candidates will have to attempt any five. All questions carry equal marks.
   2. The student can use only Non–programmable & Non–storage type Calculator.

UNIT-I

Set Theory, Relation: Element of a set Methods of describing a set. types of set. Operation on set- union, intersection and differences of set. Venn diagram, Statement problems, Associative laws, distributive laws, De-morgans law,duality, partitioning of sets. Basic definition of relation and types of relations, graphs of relations, properties of relations. (domain, range, inverse and composite relations).

UNIT-II

Differentiation and Integration: laws of derivative chain rule differentiation using log, repeated derivatives, derivatives of implicit functions.
Integration of algebraic, logarithmic and exponential functions, integration of functions using partial fraction (simple form using properties), integration of functions by parts, definite integral.

UNIT-III

Probability and Statistics: Mathematical and statistical probability, axiomatic approach to probability, Law of addition of probability, dependence of events, Baye's Theorem.

Matrices and Determinants: Introduction and definition of matrices, types of matrices, matrix addition and scaler multiplication, transpose and inverse of matrix, solution of system of linear equations, definition and properties of determinants (statement only), characteristic polynomial, eigen values, nature of eigen values, certain types of matrices, Cayley – Hamilton theorem.

Refrences:

1. Text Book of Engineering Mathematics by N.P. Bali.

2. Higher Engineering Mathematics by B.S. Grewal.

B.Sc. (Information Technology) Semester – I

PAPER–IV: COMMUNICATION SKILLS IN ENGLISH – I

Time: 3 Hours   **Max. Marks: 50**

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) Comprehension questions in multiple choice format
   c) Short comprehension questions based on content and development of ideas

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

Activities:
   a) Formatting personal and business letters.
   b) Organising the details in a sequential order
   c) Converting a biographical note into a sequenced resume or vice-versa
   d) Ordering and sub-dividing the contents while making notes.
   e) Writing notices for circulation/ boards

Suggested Pattern of Question Paper:
The question paper will consist of five skill–oriented questions from Reading and Writing Skills. Each question will carry 10 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.
                                                          10x5=50 Marks
   i)   Multiple choice questions on the language and meanings of an unseen passage.
   ii)   Comprehension questions with short answers on content, progression of ideas, purpose of writing etc. of an unseen passage.
   iii)   Personal letter and Official/Business correspondence
   iv)   Making point-wise notes on a given speech/ technical report   OR
          Writing notices for public circulation on topics of professional interest
   v)   Do as directed (10x1= 10 Marks) (change of voice, narration, combination of 2 simple sentences into one, subject-verb agreement, using appropriate tense, forms of verbs.

Recommended Books:

   1. *Oxford Guide to Effective Writing and Speaking* by John Seely.
   2. *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP

Paper-V: ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ)

ਸਮਾਂ : 3 ਘੰਟੇ   ਕੁਲ ਅੰਕ : 50

ਪਾਠ-ਕ੍ਰਮ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ

1.   **ਗਿਆਨ ਮਾਲਾ** (ਵਿਗਿਆਨਕ ਤੇ ਸਮਾਜ-ਵਿਗਿਆਨਕ ਲੇਖਾਂ ਦਾ ਸੰਗ੍ਰਹਿ),

(ਸੰਪਾ. ਡਾ. ਸਤਿੰਦਰ ਸਿੰਘ, ਪ੍ਰੋ. ਮਹਿੰਦਰ ਸਿੰਘ ਬਨਵੈਤ), ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ,

ਅੰਮ੍ਰਿਤਸਰ।

ਲੇਖ : ਪਹੀਆ ਪ੍ਰਦੂਸ਼ਣ, ਭਰੂਣ ਹੱਤਿਆ ਦੇ ਦੇਸ਼ ਵਿਚ, ਨਾਰੀ ਸ਼ਕਤੀ, ਵਾਤਾਵਰਣੀ ਪ੍ਰਦੂਸ਼ਣ

ਅਤੇ ਮਨੁੱਖ, ਏਡਜ਼ : ਇਕ ਗੰਭੀਰ ਸੰਕਟ।

2.   **ਆਤਮ ਅਨਾਤਮ** (ਸੰਪ. ਸੁਹਿੰਦਰ ਬੀਰ ਅਤੇ ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ)

(ਪ੍ਰੋ. ਮੋਹਨ ਸਿੰਘ, ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ, ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਲਵੀ, ਸੁਰਜੀਤ ਪਾਤਰ, ਪਾਸ਼)

ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

3.   **ਪੈਰ੍ਹਾ ਰਚਨਾ**

4.   **ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ।**

5.   (ੳ)**ਪੰਜਾਬੀ ਧੁਨੀ ਵਿਉਂਤ** : ਉਚਾਰਨ ਅੰਗ, ਉਚਾਰਨ ਸਥਾਨ ਤੇ ਵਿਧੀਆਂ, ਸਵਰ, ਵਿਅੰਜਨ, ਸੁਰ।

(ਅ)**ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ** : ਭਾਸ਼ਾ ਦਾ ਟਕਸਾਲੀ ਰੂਪ, ਭਾਸ਼ਾ ਅਤੇ ਉਪ-ਭਾਸ਼ਾ ਦਾ ਅੰਤਰ, ਪੰਜਾਬੀ

ਉਪ-ਭਾਸ਼ਾਵਾਂ ਦੇ ਪਛਾਣ-ਚਿੰਨ੍ਹ।

6.   **ਮਾਤ ਭਾਸ਼ਾ ਦਾ ਅਧਿਆਪਨ**

(ੳ)   ਪਹਿਲੀ ਭਾਸ਼ਾ ਦੇ ਤੌਰ ਉੱਤੇ

(ਅ)   ਦੂਜੀ ਭਾਸ਼ਾ ਦੇ ਤੌਰ ਉੱਤੇ

ਅੰਕ–ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ:

1. ਕਿਸੇ ਨਿਬੰਧ ਦਾ ਸਾਰ ਜਾਂ ਉਸਦਾ ਵਿਸ਼ਾ ਵਸਤੂ (ਦੋ ਵਿਚੋਂ ਇਕ) ।   10 ਅੰਕ

2. **ਆਤਮ ਅਨਾਤਮ** : ਸਾਰ, ਵਿਸ਼ਾ–ਵਸਤੂ, ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ, ਕਲਾ ਪੱਖ   10 ਅੰਕ

3. ਪੈਰ੍ਹਾ ਰਚਨਾ : ਤਿੰਨ ਵਿਸ਼ਿਆਂ ਵਿਚੋਂ ਕਿਸੇ ਇਕ ਉਤੇ ਪੈਰ੍ਹਾ ਲਿਖਣ ਲਈ   05 ਅੰਕ
    ਕਿਹਾ ਜਾਵੇ ।

4. ਪੈਰ੍ਹਾ ਦੇ ਕੇ ਉਸ ਬਾਰੇ ਪੰਜ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ।   05 ਅੰਕ

5. ਨੰਬਰ 5 ਉਤੇ ਦਿੱਤੀ ਵਿਆਕਰਣ ਦੇ ਆਧਾਰ 'ਤੇ ਵਰਣਨਾਤਮਕ ਪ੍ਰਸ਼ਨ।   10 ਅੰਕ

6. ਨੰਬਰ 6 ਵਿਚ ਮਾਤ ਭਾਸ਼ਾ ਦੇ ਪਹਿਲੀ ਭਾਸ਼ਾ ਅਤੇ ਦੂਜੀ ਭਾਸ਼ਾ ਵਜੋਂ
    ਅਧਿਆਪਨ, ਮਹੱਤਵ ਅਤੇ ਸਮੱਸਿਆਵਾਂ ਬਾਰੇ ਚਾਰ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ,
    ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ ਵਿਦਿਆਰਥੀ ਨੇ ਦੋ ਦਾ ਉੱਤਰ ਦੇਣਾ ਹੋਵੇਗਾ।   5×2=10 ਅੰਕ

PAPER–V: ਮੁੱਢਲੀ ਪੰਜਾਬੀ
(In lieu of Punjabi Compulsory)

ਸਮਾਂ : 3 ਘੰਟੇ   ਕੁਲ ਅੰਕ: 50

ਪਾਠ-ਕ੍ਰਮ

1.   ਪੈਂਤੀ ਅੱਖਰੀ; ਪੈਰ ਬਿੰਦੀ ਵਾਲੇ ਵਰਣ ਅਤੇ ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣ, ਲਗਾਂ ਮਾਤਰਾਂ

2.   ਲਗਾਖਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ)

3.   (ੳ)   ਵਿਸ਼ਰਾਮ ਚਿੰਨ੍ਹਾਂ ਦੀ ਵਰਤੋਂ,

      (ਅ)   ਨਾਂਵ, ਪੜਨਾਂਵ, ਕਿਰਿਆ, ਵਿਸ਼ੇਸ਼ਣ, ਲਿੰਗ ਅਤੇ ਵਚਨ

ਅੰਕ ਵੰਡ ਤੇ ਪੇਪਰ ਸੈਟਰ ਲਈ ਹਦਾਇਤਾਂ

1.   ਪੈਂਤੀ ਅੱਖਰੀ ਦੀ ਬਣਤਰ ਅਤੇ ਤਰਤੀਬ ਨਾਲ ਸੰਬੰਧਿਤ ਪ੍ਰਸ਼ਨ।   **10 ਅੰਕ**
      (ਦੋ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚੋਂ ਇੱਕ ਕਰਨਾ ਹੋਵੇਗਾ)
      ਕਵਰਗ, ਚਵਰਗ, ਤਵਰਗ, ਟਵਰਗ ਆਦਿ ਸੰਬੰਧੀ ਪ੍ਰਸ਼ਨ ਪੁੱਛਿਆ ਜਾ
      ਸਕਦਾ ਹੈ। ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣ ਅਤੇ ਲਗਾਂ ਮਾਤਰਾਂ ਦੀ ਵਰਤੋਂ ਨਾਲ
      ਸੰਬੰਧਿਤ ਪ੍ਰਸ਼ਨ (ਦੋ ਵਿਚੋਂ ਇੱਕ ਕਰਨਾ ਹੋਵੇਗਾ)   **10 ਅੰਕ**

2.   ਬਿੰਦੀ, ਟਿੱਪੀ ਅਤੇ ਅੱਧਕ ਦੀ ਵਰਤੋਂ ਸੰਬੰਧੀ ਪ੍ਰਸ਼ਨ   **10 ਅੰਕ**

3.   (ੳ)   ਵਿਸ਼ਰਾਮ ਚਿੰਨ੍ਹਾਂ ਦੀ ਵਰਤੋਂ ਸੰਬੰਧੀ ਪ੍ਰਸ਼ਨ   **10 ਅੰਕ**

      (ਅ)   ਨਾਂਵ ਪੜਨਾਂਵ, ਕਿਰਿਆ, ਵਿਸ਼ੇਸ਼ਣ ਅਤੇ ਲਿੰਗ ਵਚਨ ਸੰਬੰਧੀ ਮੁੱਢਲੀ
             ਕਿਸਮ ਦੇ ਪ੍ਰਸ਼ਨ (ਦੋ ਵਿਚੋਂ ਇੱਕ ਕਰਨਾ ਹੋਵੇਗਾ)   **10 ਅੰਕ**

B.Sc. (Information Technology) Semester – I

Paper –VI: (Practical)
PC Computing and C Language-I

Time: 3 Hours   **Max. Marks: 75**

Practical – C Language Part I & PC Computing

B.Sc. (Information Technology) Semester – II

PAPER – I: COMMUNICATION SKILLS IN ENGLISH – II

Time: 3 Hours   **Max. Marks: 50**
                                                                   Theory Marks: 35
                                                                 Practical Marks: 15

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, News and TV reports
    b) Taking notes on a speech/lecture

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.
    The study of sounds of English, stress
    Situation based Conversation in English
    Essentials of Spoken English

    Activities:
    a) Making conversation and taking turns
    b) Oral description or explanation of a common object, situation or concept
    c) Giving interviews

Suggested Pattern of Question Paper:

The question paper will consist of seven questions related to speaking and listening Skills. Each question will carry 5 marks. The nature of the questions will be as given below:-

Two questions requiring students to give descriptive answers.

Three questions in the form of practical exercises requiring students to give an appropriate response to a question, a proposal, a proposition, an invitation etc. For example, the paper setter may give a proposition and ask the students to agree or disagree with it or introduce a character giving invitations and ask the students to accept or refuse it etc.

Two questions requiring students to transcribe simple words in IPA symbols, marking stress.

B.Sc. (Information Technology) Semester – II

PRACTICAL / ORAL TESTING

Marks: 15

Course Contents:

1. Oral Presentation with/without audio visual aids.
2. Group Discussion.
3. Listening to any recorded or live material and asking oral questions for listening comprehension.

Questions:

1. Oral Presentation will be of 5 to 10 minutes duration. (Topic can be given in advance or it can be of student's own choice). Use of audio visual aids is desirable.

2. Group discussion comprising 8 to 10 students on a familiar topic. Time for each group will be 15 to 20 minutes.

Note: Oral test will be conducted by external examiner with the help of internal examiner.

B.Sc. (Information Technology) Semester – II

PAPER-II: ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ)

ਸਮਾਂ : 3 ਘੰਟੇ   ਕੁਲ ਅੰਕ : 50

ਪਾਠ-ਕ੍ਰਮ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ

1. **ਗਿਆਨ ਮਾਲਾ** (ਵਿਗਿਆਨਕ ਤੇ ਸਮਾਜ-ਵਿਗਿਆਨਕ ਲੇਖਾਂ ਦਾ ਸੰਗ੍ਰਹਿ)
    (ਸੰਪ. ਡਾ. ਸਤਿੰਦਰ ਸਿੰਘ, ਪ੍ਰੋ. ਮਹਿੰਦਰ ਸਿੰਘ ਬਨਵੈਤ), ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ,
    ਅੰਮ੍ਰਿਤਸਰ, 2007
    ਲੇਖ : ਸਾਹਿਤ ਤੇ ਲੋਕ ਸਾਹਿਤ, ਅੱਖਾਂ, ਅਚੇਤਨ ਦਾ ਗੁਣ ਤੇ ਸੁਭਾਅ, ਕੰਪਿਊਟਰ ਅਤੇ
    ਇੰਟਰਨੈੱਟ, ਮਨੁੱਖੀ ਅਧਿਕਾਰ।
2. **ਆਤਮ ਅਨਾਤਮ** (ਸੰਪ. ਸੁਹਿੰਦਰ ਬੀਰ ਅਤੇ ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ) (ਕਹਾਣੀਆਂ)
    ਪਠਾਣ ਦੀ ਧੀ (ਸੁਜਾਨ ਸਿੰਘ), **ਸਾਂਝੀ ਕੰਧ** (ਸੰਤੋਖ ਸਿੰਘ ਧੀਰ), **ਉਜਾੜ** (ਕੁਲਵੰਤ ਸਿੰਘ
    ਵਿਰਕ), **ਘੋਟਣਾ** (ਮੋਹਨ ਭੰਡਾਰੀ), **ਦਲਦਲ** (ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ)
    ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

3. **ਸ਼ਬਦ-ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ** : ਪਰਿਭਾਸ਼ਾ, ਮੁੱਢਲੇ ਸੰਕਲਪ
4. **ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ**
5. **ਪੈਰ੍ਹਾ ਰਚਨਾ**
6. **ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ**
7. **ਮੁਹਾਵਰੇ ਅਤੇ ਅਖਾਣ**

ਅੰਕ–ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ:

1. ਕਿਸੇ ਨਿਬੰਧ ਦਾ ਸਾਰ ਜਾਂ ਉਸਦਾ ਵਿਸ਼ਾ ਵਸਤੂ (ਦੋ ਵਿਚੋਂ ਇਕ) ।   10 ਅੰਕ
2. **ਆਤਮ ਅਨਾਤਮ** : ਸਾਰ, ਵਿਸ਼ਾ ਵਸਤੂ, ਪਾਤਰ ਚਿਤਰਣ, ਸਾਹਿਤ ਨੂੰ ਦੇਣ   10 ਅੰਕ
3-4. 3-4 ਨੰਬਰ ਉੱਤੇ ਦਿੱਤੀ ਵਿਆਕਰਣ ਦੇ ਆਧਾਰ ਤੇ ਵਰਣਨਾਤਮਕ ਪ੍ਰਸ਼ਨ।   10 ਅੰਕ
5. ਪੈਰ੍ਹਾ ਰਚਨਾ : ਤਿੰਨ ਵਿਸ਼ਿਆਂ ਵਿਚੋਂ ਕਿਸੇ ਇਕ ਉੱਤੇ ਪੈਰ੍ਹਾ ਲਿਖਣ ਲਈ   05 ਅੰਕ
    ਕਿਹਾ ਜਾਵੇ ।
6. ਪੈਰ੍ਹਾ ਦੇ ਕੇ ਉਸ ਬਾਰੇ ਪੰਜ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ   05 ਅੰਕ
7. ਨੰਬਰ 7 ਵਿਚ ਅੱਠ ਅਖਾਣ ਅਤੇ ਅੱਠ ਮੁਹਾਵਰੇ ਪੁੱਛੇ ਜਾਣਗੇ, ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ
    ਵਿਦਿਆਰਥੀ ਨੇ ਪੰਜ-ਪੰਜ ਨੂੰ ਵਾਕਾਂ ਵਿਚ ਵਰਤ ਕੇ ਅਰਥ ਸਪੱਸ਼ਟ ਕਰਨੇ ਹੋਣਗੇ।

                                                                                  5+5=10 ਅੰਕ

PAPER–II: ਮੁੱਢਲੀ ਪੰਜਾਬੀ
(In lieu of Punjabi Compulsory)

ਸਮਾਂ: 3 ਘੰਟੇ   ਕੁਲ ਅੰਕ: 50

ਪਾਠ – ਕ੍ਰਮ

1. ਪੰਜਾਬੀ ਸ਼ਬਦ-ਬਣਤਰ
    ਸੰਯੁਕਤ ਅਤੇ ਮਿਸ਼ਰਤ ਸ਼ਬਦ
    ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ   **20 ਅੰਕ**
2. ਭਾਸ਼ਾ ਅਤੇ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ
    ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ   **15 ਅੰਕ**
3. ਪੰਜਾਬੀ ਵਾਕ ਬਣਤਰ
    ਸਾਧਾਰਨ ਵਾਕ: ਕਿਸਮਾਂ
    ਸੰਯੁਕਤ ਵਾਕ: ਕਿਸਮਾਂ
    ਮਿਸ਼ਰਤ ਵਾਕ: ਕਿਸਮਾਂ
    ਪੰਜਾਬੀ ਵਾਕਾਂ ਦੀ ਵਰਤੋਂ ਦੇ ਵਿਭਿੰਨ ਸਮਾਜਿਕ ਪ੍ਰਸੰਗ   **15 ਅੰਕ**

ਯੂਨਿਟ ਅਤੇ ਥੀਮ

1. **ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ:** ਸੰਯੁਕਤ ਸ਼ਬਦ; ਸਮਾਸੀ ਸ਼ਬਦ (ਜਿਵੇਂ ਲੋਕ ਸਭਾ); ਦੋਹਰੇ ਸ਼ਬਦ / ਦੁਹਰਰੁਕਤੀ (ਜਿਵੇਂ ਧੂੜ ਧਾੜ / ਭਰ ਭਰ), ਮਿਸ਼ਰਤ ਸ਼ਬਦਾਂ ਦੀ ਬਣਤਰ/ਸਿਰਜਨਾ; ਅਗੇਤਰਾਂ ਰਾਹੀਂ (ਜਿਵੇਂ ਉਪ ਭਾਸ਼ਾ), ਪਿਛੇਤਰਾਂ ਰਾਹੀਂ (ਜਿਵੇਂ ਰੰਗਲਾ), ਪੰਜਾਬੀ ਸ਼ਬਦ ਰਚਨਾ: ਪੜਨਾਵੀਂ ਰੂਪ, ਕਿਰਿਆ/ਸਹਾਇਕ ਕਿਰਿਆ ਦੇ ਰੂਪ; ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ: ਰੁੱਤਾਂ, ਮਹੀਨਿਆਂ, ਮੌਸਮਾਂ, ਗਿਣਤੀ ਨਾਲ ਸੰਬੰਧਿਤ ।

2. I.   ਭਾਸ਼ਾ ਅਤੇ ਮਾਤ ਭਾਸ਼ਾ ਦੇ ਮਹੱਤਵ ਸੰਬੰਧੀ ਪ੍ਰਸ਼ਨ

    II. ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ ਸੰਬੰਧੀ ਪ੍ਰਸ਼ਨ

3. **ਪੰਜਾਬੀ ਵਾਕ ਬਣਤਰ:** ਕਰਤਾ ਕਰਮ ਕਿਰਿਆ; ਸਾਧਾਰਨ ਵਾਕ, ਬਿਆਨੀਆ, ਪ੍ਰਸ਼ਨਵਾਚਕ, ਆਗਿਆਵਾਚਕ, ਸੰਯੁਕਤ ਅਤੇ ਮਿਸਰਤ ਵਾਕਾਂ ਦੀਆਂ ਕਿਸਮਾਂ; ਸੁਤੰਤਰ ਅਤੇ ਅਧੀਨ ਉਪਵਾਕ; ਸਮਾਨ (ਤੇ/ਅਤੇ) ਅਤੇ ਅਧੀਨ (ਜੋ/ਕਿ) ਯੋਜਕਾਂ ਦੀ ਵਰਤੋਂ; ਪੰਜਾਬੀ ਵਾਕਾਂ ਦੀ ਵਰਤੋਂ: ਵਿਭਿੰਨ ਸਮਾਜਕ/ਸਭਿਆਚਾਰਕ ਪ੍ਰਸੰਗ; ਘਰ ਵਿਚ, ਬਾਜ਼ਾਰ ਵਿਚ, ਮੇਲੇ ਵਿਚ, ਸ਼ੋਪਿੰਗ ਮਾਲ/ਸਿਨਮੇ ਵਿਚ, ਵਿਆਹ ਵਿਚ, ਧਾਰਮਿਕ ਸਥਾਨਾਂ ਵਿਚ, ਦੋਸਤਾਂ ਨਾਲ ਆਦਿ।

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪਹਿਲੇ ਯੂਨਿਟ ਵਿੱਚੋਂ ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ ਨਾਲ ਸਬੰਧਿਤ 5-5 ਅੰਕਾਂ ਦੇ ਤਿੰਨ ਵਿਹਾਰਕ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਅੰਕਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਇਕ-ਇਕ ਜਾਂ ਦੋ-ਦੋ ਅੰਕਾਂ ਦੇ ਛੋਟੇ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕੀਤੀ ਜਾ ਸਕਦੀ ਹੈ। ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਸ਼ਬਦਾਵਲੀ ਨਾਲ ਸਬੰਧਿਤ ਇਕ-ਇਕ ਅੰਕ ਦੇ ਪੰਜ (ਆਬਜੈਕਟਿਵ) ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

20 ਅੰਕ

2. ਦੂਸਰੇ ਯੂਨਿਟ ਵਿੱਚ ਭਾਸ਼ਾ ਅਤੇ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ ਨਾਲ ਸੰਬੰਧਿਤ 5-5 ਅੰਕਾਂ ਦੇ ਤਿੰਨ ਵਿਹਾਰਕ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਅੰਕਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਇੱਕ-ਇੱਕ ਜਾਂ ਦੋ-ਦੋ ਅੰਕਾਂ ਦੇ ਛੋਟੇ ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚ ਕੀਤੀ ਜਾ ਸਕਦੀ ਹੈ।

15 ਅੰਕ

3. ਤੀਜੇ ਯੂਨਿਟ ਵਿੱਚ ਪੰਜਾਬੀ ਵਾਕ-ਬਣਤਰ ਨਾਲ ਸਬੰਧਿਤ 5-5 ਅੰਕਾਂ ਦੇ ਦੋ ਵਿਹਾਰਕ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਅੰਕਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਇਕ-ਇਕ ਜਾਂ ਦੋ-ਦੋ ਅੰਕਾਂ ਦੇ ਛੋਟੇ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕੀਤੀ ਜਾ ਸਕਦੀ ਹੈ।

ਪੰਜਾਬੀ ਵਾਕਾਂ ਦੀ ਵਿਹਾਰਕ ਵਰਤੋਂ ਨਾਲ ਸਬੰਧਿਤ 5 ਅੰਕਾਂ ਦਾ ਇਕ ਪ੍ਰਸ਼ਨ ਪੁੱਛਿਆ ਜਾਵੇਗਾ, ਜਿਸ ਵਿਚ ਵਿਦਿਆਰਥੀ ਨੂੰ ਕਿਸੇ ਸਮਾਜਿਕ/ਸਭਿਆਚਾਰਕ ਪ੍ਰਸੰਗ ਵਿਚ ਵਰਤੇ ਜਾਂਦੇ ਪੰਜ ਵਾਕ ਲਿਖਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ। ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਭਾਸ਼ਾ ਸਰਲ ਅਤੇ ਸਪਸ਼ਟ ਰੱਖੀ ਜਾਵੇ।

15 ਅੰਕ

B.Sc. (Information Technology) Semester – II

Paper–III: Principles of Digital Electronics

Time: 03 Hours: **M. Marks: 75**

Note: 1. Eight questions are required to be set giving equal weightage to all the units. The candidates will have to attempt any five. All questions carry equal marks.
2. The students can use only non-programmable & non-storage type calculator.

UNIT-I
Number System: Introduction, number conversion system , binary arithmetic, representation of signed binary numbers, 1's and 2's complement, Codes: straight binary code, BCD Code Excess3 Code, Grey Code ASCII, Integer and floating point representation

Logic Gates and Boolean Algebra: Logic gates, Universal Gates, Boolean algebra and Minimization techniques, canonical forms of Boolean expressions, K-Map

UNIT-II
Combinational Circuits: Adder, Subtracter, Multiplexer, Demultiplexer, Decoder, Encoder

Sequential Circuits: Flip-flops, clocks and timers, registers, counter

UNIT-III
Semiconductor memories: Introduction, Static and dynamic devices, read only & random access memory chips, PROMS and EPROMS Address selection logic. Read and write control timing diagrams for ICs

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.
.

B.Sc. (Information Technology) Semester – II

Paper – IV: C Programming Part–II

Time: 3 Hours   **Max. Marks: 75**

Note: 1. Eight questions are required to be set giving equal weightage to all the units. The candidates will have to attempt any five. All questions carry equal marks.
2. The student can use only Non–programmable & Non–storage type Calculator.

UNIT-I
Strings: String declaration, string functions and string manipulation.

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

UNIT-II
Storage classes: Automatic, external and static variables.

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

UNIT-III
Data Files: Opening, closing, creating and processing of data files.

Programming exercises of above concepts

References:
1.   Programming in C   :   Schaum Outlines Series.
2.   C Programming   :   Stephen G. Kochan.

Paper – V: Numerical Methods and Statistical Techniques

Time: 3 Hours   **Max. Marks: 75**

Note: 1. Eight questions are required to be set giving equal weightage to all the units. The candidates will have to attempt any five. All questions carry equal marks.
2. The student can use only Non–programmable & Non–storage type Calculator.

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.

UNIT-II

 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.
$Y = ax^b$
$Y = ab^x$
$Y = ae^x$
Polynomial fit: $Y = a+bx+cn^2$

UNIT-III

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.

B.Sc. (Information Technology) Semester – II

Paper–VI: C Language–II
(Practical)

Max Marks: 75
Practical- Implementation of Numerical Methods and Statistical Techniques Using C Language

Paper – I: Object Oriented Programming Using C++

Time: 3 Hours   **M. Marks: 75**

Note : 1. In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks. The maximum marks of the paper is 75.
2. The student can use only Non–programmable & Non–storage type Calculator.

UNIT-I

C++ Programming Basics Basic Program Construction, Output using cout, Preprocessor Directive, Comments, Integer Variables, Declaration and Definitions, Character Variables, Input using cin, Type float, Manipulators, Unsigned data types, Type conversions, Arithmetic Operators, Library functions.

Loops and Decisions Relational Operators, Loops: The for loop, for loop variations, The while loop, do loop, Decision: The if statement, The else…. If construction, The switch statement, The conditional operators, Logical Operators: Logical AND operator, The logical OR operator, The logical NOT operator, Other Control Statements: The break statements, The continue statement, The goto statement.

UNIT-II

Structures Defining and processing a structure, user defined data types structure, Enumerated Data Types.
Functions Brief overview defining, Accessing function, Passing Arguments to functions, Returning values from functions, Overloaded functions, Inline functions, Default Arguments, Variables and Storage Classes: Automatic Variables, External Variables, Static Variables, Storage.
Object & Classes A simple Class: Classes and objects, Specifying the class Using the class, C++ Objects as physical Objects, C++ Objects as Data types, Constructions, Objects as Functions Arguments: Overloaded Constructors, Member Functions Defined Outside the Class, Objects as Arguments, Returning Objects from Functions, Static Class Data.

UNIT-III

Arrays: Defining and processing an array, passing array to a function, multi – dimensional arrays, Strings: String declaration, string functions and string manipulation.
Operator Overloading Overloading Unary Operators, Overloading Binary Operators, Data Conversion, Pitfalls of Operators Overloading and Conversion.
Inheritance Derived Class and Base Class, Derived Class Constructors, Overriding Member Functions, Inheritance in the English Distance Class, Class Hierarchies, Public and Private Inheritance, Levels of Inheritance, Multiple Inheritance.

Books:
1. C++ & Graphics by Vijay Mukhi's
2. Turbo C++ by Robert Lafore.
3. Mastering C++.
4. C++ Programming Language by Schaum's outline series.

Paper – II: Data Structure

Time: 3 Hours **M. Marks: 75**

Note : 1. In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks. The maximum marks of the paper is 75.
    2. The student can use only Non–programmable & Non–storage type Calculator.

UNIT-I
Basic Data Structure: Introduction to elementary Data Organization, Common Operation on Data Structures, Algorithm Complexity, Big O Notation, Time – Space trade off between Algorithms.

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

UNIT-II
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.

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

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

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

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

References:
1. Seymour Lipschutz, Theory and Problems of Data Structures, Schaum's Outline Series, McGraw Hill Company.
2. Tanenbaum, Data Structure using C.

B.Sc. (Information Technology) Semester – III

Paper – III: System Analysis & Design

Time: 3 Hours   **M. Marks: 75**

Note: **1. In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks. The maximum marks of the paper is 75.**
2. The student can use only Non–programmable & Non–storage type Calculator.

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.

UNIT–II
System Design: Input/Output Design, Modular and Structured Design, Tools for structured design and system design considerations.
System Implementation: System testing, Quality assurance, Documentation tools, Managing system implementation.

UNIT–III
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.

PAPER–IV: ENVIRONMENTAL STUDIES-I

Time: 3 Hrs.   **Max. Marks: 50**
Theory Lectures: 1½ Hours/ Week

Section–A: (15 Marks): It will consist of five short answer type questions. Candidates will be required to attempt three questions, each question carrying five marks. Answer to any of the questions should not exceed two pages.
Section–B: (20 Marks): It will consist of four essay type questions. Candidates will be required to attempt two questions, each question carrying ten marks. Answer to any of the questions should not exceed four pages.
Section–C: (15 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.

1. **The Multidisciplinary Nature of Environmental Studies:** Definition, scope & its importance, Need for public awareness.

2. **Natural Resources**: Natural resources and associated problems. Role of an individual in conservation of natural resources, Equitable use of resources for sustainable lifestyles.
   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 or 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 Recourses**: Land as a resource, land degradation, soil erosion and desertification.

3. **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.
   Types, characteristic features, structure and function of - forest ecosystem, grassland ecosystem, desert ecosystem and aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

4. **Social Issues and Environment:**
   • From unsustainable to sustainable development
   • Water conservation, rain water harvesting, watershed management; Wasteland reclamation.
   • Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents

- 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.

  * 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

5. 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.

Paper – V
(Programming Lab-I)

Lab – I: Based on C++, Programming Language   50 Marks

Paper – VI
(Programming Lab-II)

Lab – II: Data Structure   25 Mark

Paper – I: Database Management System and Oracle

Time: 3 Hours **M. Marks: 75**

Note : **(i) In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks.**
(ii) The maximum marks of the paper is 75.
(iii) As per as possible except in the Computer language papers no programmer may be asked in theory papers. Exphasis should be on algorithm development.
(iv) The student can use only Non–programmable & Non–storage type Calculator.

Practical marks will include the appropriate weightage for proper maintenance of Lab record.

UNIT-I

Introduction to Data, fields, record, file, database, database management system, structure of database system, advantage & disadvantage, levels of database system, Relational model, Hierarchical model, Network model, comparison of these model, E–R diagram, different keys used in a relations system, SQL.

UNIT-II

DBA, responsibilities of DBA, Relational form like 1NF, 2NF, 3NF, BCNF, 4th NF, 5th NF, DBTG, Concurrency control and its management, protection, security, recovery of database.

UNIT-III

Oracle

 SQL * PLUS: Introduction to Oracle 8, SQL–DDL, DML, DCL, Join methods & sub query, Union Intersection, Minus, Tree Walking, Built in Functions, Views, Security amongst users, Sequences, Indexing Object Oriented Features of Oracle 8.0.

PL/SQL: Introduction to PL/SQL, Cursors–Implicit & explicit, Procedures, Functions & Packages Database Triggers.

References:

Introduction to Database by C.J.Date
Database Management System by B.C.Desai
Database Concept by Korth
Oracle–Developer– 2000 by Ivan Bayross
Database System Concepts & Oracle(SQL/PLSQ)–AP Publishers

B.Sc. (Information Technology) Semester – IV

Paper – II: Internet Applications

Time: 3 Hours   **M. Marks: 75**

Note: 1. In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks. The maximum marks of the paper is 75.
2. The student can use only Non–programmable & Non–storage type Calculator.

UNIT-I
Introduction : About internet and its working, business use of internet, services effect by internet, evaluation of Internet, Internet Service Provider (ISP) windows environment for dial up networking (connecting to internet), audio on internet, 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.

UNIT-II
Internet protocol Introduction, tile 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 FFTML, DTTML with programming techniques.

UNIT-III
Search engine: About search engine, component of search engine, working of search engine, difference between search engine and web directory.

Internet and extranet: Introduction, application of intranet, business value of intranet, working of intranet, role of extranet, working of extranet, difference between intranet and extranet.

B.Sc. (Information Technology) Semester – IV

Paper – III: Java & Web Designing

Time: 3 Hours   **Max. Marks: 75**

Note: 1. In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks. The maximum marks of the paper is 75.
2. The student can use only Non–programmable & Non–storage type Calculator.

UNIT-I

Introduction to Concepts of Programming: Object Orientation Concepts, Platform, Independence & Cross Platform Computing.

UNIT-II

Introduction to Java: Control Statements, Operators Data Types.

UNIT-III

Introduction to OOPS: Classes & Methods, constructors, Inheritance & Polymorphism. Packages & Interfaces, Multithreading in Java, Exception Handling, String handling in Java & Input/Output in Java

Introduction to Web Designing through HTML

References:

1. "Java–The Complete Reference", Hurbert Schildt, Tata MacGraw Hill.
2. "Introduction to Java Programming", Y. Daniel Mliang, Pearsons Publications.
3. "Beginning Web Programming with HTML, XHTML, and CSS", Jon Duckett, John Wiley & Sons, 06 Aug. 2004.
4. "HTML & XHTML: The Complete Reference", Thomas A. Powell, McGraw-Hill.

PAPER–IV: ENVIRONMENTAL STUDIES-II

Time: 3 Hrs.   **Max. Marks: 50**
Theory Lectures: 1½ Hours/ Week

Section–A: (15 Marks): It will consist of five short answer type questions. Candidates will be required to attempt three questions, each question carrying five marks. Answer to any of the questions should not exceed two pages.
Section–B: (20 Marks): It will consist of four essay type questions. Candidates will be required to attempt two questions, each question carrying ten marks. Answer to any of the questions should not exceed four pages.
Section–C: (15 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.

1. **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 at 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.
2. **Environmental Pollution:** Definition, Causes, effects and control measures of - air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear hazards.
   Solid Waste Management: Causes, effects and control measures of urban and industrial wastes.

3. **Human Population and the Environment**
    1. Environment and human health
    2. Population growth, variation among nations
    3. Population explosion-Family welfare programme
    4. HIV / AIDS
    5. Value education
    6. Women and child welfare

4. **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.

5. **Drug Use and Abuse in Society:**
   - Concept and Overview, extent of the problem, drug use as a social problem, causes of drug uses-Biological, socio-cultural, psychological
   - Types of Drugs and Identification of Abuse: Familiar drugs-tobacco, caffeine, over the counter drugs; Restricted drugs- opiates, hallucinogens, marijuana; Performance enhancing drugs; Uppers and downers- stimulants and depressants
   - Impact of Drug Abuse: Individual level-biological and psychological, family, social and national.
   - Management and Prevention of Drug Abuse: Medical and psychological; role of family, schools, media and legislation.

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.
11. Espejo, R. (2002). Drug Abuse, Greenhaven Press.
12. Sussman, S and Ames, S.L. (2008). Drug Abuse: Concepts, Prevention and Cessation, Cambridge University Press.

B.Sc. (Information Technology) Semester – IV

Paper – V: Compiler Design

Time: 3 Hours   **M. Marks: 75**

Note : 1. In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks. The maximum marks of the paper is 75.
       2. The student can use only Non–programmable & Non–storage type Calculator.

UNIT-I

Basics of Compilers and different phases of compiler design
Detailed study of Lexical Analysis and Syntax Analysis

UNIT-II

Symbol Table Handling
Symbol table contents, operations on Symbol Tables, Organizations of Symbol Tables.
Storage Management
Static Storage Management, Dynamic Storage Management.
Code Generation
Code Generator, Code generation of simple programming constructs.

UNIT-III

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*, Addision 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.

Paper – VI
(Programming Lab-I)

Lab – I: *Oracle*   *50 Marks*

Paper – VII
(Programming Lab-II)

Lab – II: *HTML & Java*   *50 Marks*

B.Sc. (Information Technology) Semester – V

Paper – I: Computer Networks

Time: 3 Hrs.   **M. Marks: 100**

Instructions for the Paper Setters:-
Note : 1. In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks. The maximum marks of the paper is 100.
2. The student can use only Non–programmable & Non–storage type Calculator.

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.

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

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.

UNIT – III
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.

Paper – II: Operating System

Time: 3 Hrs.   **Max. Marks: 100**

Instructions for the Paper Setters:-
Note: 1. In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks. The maximum marks of the paper is 100.
   2. The student can use only Non–programmable & Non–storage type Calculator.

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.

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.

UNIT – III
Device Management:
I/O and device management physical characteristics, FCFS, SSTF, SCAN, CSCAN.
File Management:
Disk and File Management.
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.

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.

Paper – III: E–Business

Time: 3 Hrs.   **Max. Marks: 100**

Instructions for the Paper Setters:-
Note: 1. In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks. The maximum marks of the paper is 100.
  2. The student can use only Non–programmable & Non–storage type Calculator.

UNIT – I

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

Steps to Star 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.

UNIT – II

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

NII: 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.

Re – Engineering for Change:
Business process re – engineering BPR, Methodology Planning Methods for change to EC / EDI.

UNIT – III

Case Studies: To demonstrate usefulness of E – Commerce in various business areas.
Banks, Reservations, E – Governance, supply – chain, Management, manufacturing, retailing and online – publishing.

E – Commerce in India:
EDI service providers in India, EDI Projects in the Government regulatory agencies. The Internet in India, laws for E – Commerce in India.

Reference:
E – Commerce –   The Cutting Edge of Business.
                      Kamlesh K. Bajaj.
                      Debjani Nag.

B.Sc. (Information Technology) Semester – V

Paper – IV

Time: 3 Hours   **M.M.: 50**

Practical Lab: Computer Networks

B.Sc. (Information Technology) Semester – V

Paper – V

Time: 3 Hours   **M.M.: 50**

Practical Lab: Operating Systems

B.Sc. (Information Technology) Semester – VI

Paper – I: Option (I): Computer Graphics

Time: 3 Hrs. **M.M. 75**

Instructions for the Paper Setters:-
Note : 1. In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks.

2. The student can use only Non–programmable & Non–storage type Calculator.

UNIT-I

Preliminaries
Basics of Computer Graphics, Computer graphics Hardware and Software.
2D Primitives
Line drawing, circle drawing and simple line clipping algorithms.

UNIT-II

2D-Transformations
Simple 2D-Transformations and their different representations, composite 2D-Transformations.
3D-Transformations
Simple 3D-Transformations, composite 3D-Transformations.

UNIT-III

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

Option I: (Paper – II)

Time: 3 Hours   **M.M.: 25**

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

B.Sc. (Information Technology) Semester – VI

Option (II): Paper–I: Network Management

Networking Operating System/Client–Server Application

Time: 3 Hours   **Max. Marks: 75**

Instructions for the Paper Setters:-
Note : 1. In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks.
       2. The student can use only Non–programmable & Non–storage type Calculator.

UNIT – I
Basic Concept: History & Evaluation of Operating System, Various View of Operating System, Basic Concepts of Networking

UNIT – II
Fundamentals of Networking O.S.: Introduction components of various networking O.S., Case Studies of various Network Operating System Windows 95Windows NT/Novel Netware.

UNIT – III
Fundamental of Client Server: Basics of Client Server model and its applications, Designing a Client Server model by Creating Proxy Server, Database server and Networking O.S. Server.

References:-

1. MCSA/MCSE; Exam 70–291, Implementing, Managing and Maintaining a Windows Server 2003
2. Network Infrastructure by Shinder Deborah Littlejohn, Shroff Publishers, 7th Reprint, 2005.
3. Networking: The Complete Reference by Craig Zacker, Tata McGraw–Hill, Seventh Reprint, 2004.
4. Unix Concepts and Applications, Sumitabha Das, Third Edition, Tata McGraw Hill, First Reprint, 2003.
5. Unix and Shell Programming: A Text Book, Behrouz A. Forouzen, Second Reprint, PWS Publishers, 2005.
6. Linux: A Practical Approach, B.Mohamad Ibrahim, Second Reprint, Laxmi Publications, 2006.
7. Linux Security, Hontanon Ramon.J., BPB Publications, 2001.
8. The Internet: Douglas E. Comer, 3rd Edition, Prentice Hall, 2003.

B.Sc. (Information Technology) Semester – VI

Option(II): Paper – II: Practical Lab: Based on NOS

Time: 3 Hours   **Max. Marks: 25**

Lab: Networking O.S./Client–Server Lab.

Designing of homogenous and heterogenous lab.

Creating Windows 95/NT/Novell Netware Server.

Creating of Proxy Server.

Creating of Database Server.

Paper – III: PROJECT

Max. Marks: 300

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 respective 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.