FACULTY OF ENGINEERING & TECHNOLOGY

SYLLABUS

FOR

BACHELOR OF COMPUTER APPLICATIONS
(Semester: I – IV)
Session: 2013-14

Part: III (Annual System)
Examination: 2014

GURU NANAK DEV UNIVERSITY
AMRITSAR

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(ii) Subject to change in the syllabi at any time.
Please visit the University website time to time.
Eligibility:

a) +2 examination with 40% marks

OR

b) Any other examination with 40% marks recognized equivalent to (a) above by the Guru Nanak Dev University.
Bachelor of Computer Applications

SEMESTER SYSTEM
SCHEME

Semester – I:

<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Paper</th>
<th>M. Marks</th>
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</thead>
<tbody>
<tr>
<td>Paper–I</td>
<td>Introduction to Programming C - I</td>
<td>75</td>
</tr>
<tr>
<td>Paper–II</td>
<td>Introduction to Computers and Information Technology</td>
<td>75</td>
</tr>
<tr>
<td>Paper–III</td>
<td>Mathematical Foundation of Computer Science</td>
<td>75</td>
</tr>
<tr>
<td>Paper–IV</td>
<td>Communication Skills – I (Th.35+Pr.15)</td>
<td>50</td>
</tr>
<tr>
<td>Paper–V</td>
<td>Punjabi/Basic Punjabi (Mudhli Punjabi) (Compulsory)</td>
<td>50</td>
</tr>
<tr>
<td>Paper–VI</td>
<td>Practical–I (MS Office 2010 and Basic C Programming)</td>
<td>75</td>
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Semester – II:

<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Paper</th>
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<tbody>
<tr>
<td>Paper – I</td>
<td>Introduction to Programming C – II</td>
<td>75</td>
</tr>
<tr>
<td>Paper – II</td>
<td>Principles of Digital Electronics</td>
<td>75</td>
</tr>
<tr>
<td>Paper – III</td>
<td>Numerical Methods &amp; Statistical Techniques</td>
<td>75</td>
</tr>
<tr>
<td>Paper – IV</td>
<td>Communication Skills – II (Th.35+Pr.15)</td>
<td>50</td>
</tr>
<tr>
<td>Paper – V</td>
<td>Punjabi/Basic Punjabi (Mudhli Punjabi) (Compulsory)</td>
<td>50</td>
</tr>
<tr>
<td>Paper – VI</td>
<td>Practical – I (Advanced C Programming)</td>
<td>75</td>
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Semester – III:

<table>
<thead>
<tr>
<th>Paper No.</th>
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<tbody>
<tr>
<td>Paper–I</td>
<td>Computer Architecture</td>
<td>75</td>
</tr>
<tr>
<td>Paper–II</td>
<td>Database Management System &amp; Oracle</td>
<td>75</td>
</tr>
<tr>
<td>Paper–III</td>
<td>C++ (OOP Language)</td>
<td>75</td>
</tr>
<tr>
<td>Paper–IV</td>
<td>Environmental Studies – I (Compulsory)</td>
<td>50</td>
</tr>
<tr>
<td>Paper–V</td>
<td>Programming Lab – C++</td>
<td>50</td>
</tr>
<tr>
<td>Paper–VI</td>
<td>Programming Lab – Oracle</td>
<td>25</td>
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Bachelor of Computer Applications

Semester – IV:

<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Paper</th>
<th>M. Marks</th>
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<tbody>
<tr>
<td>Paper – I</td>
<td>Data Structure &amp; File Processing</td>
<td>75</td>
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<tr>
<td>Paper – II</td>
<td>Information Systems</td>
<td>75</td>
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<tr>
<td>Paper – III</td>
<td>Internet Applications</td>
<td>75</td>
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<tr>
<td>Paper – IV</td>
<td>System Software</td>
<td>75</td>
</tr>
<tr>
<td>Paper – V</td>
<td>Environmental Studies – II (Compulsory)</td>
<td>50</td>
</tr>
<tr>
<td>Paper – VI</td>
<td>Lab – Data Structures implementation using C++</td>
<td>50</td>
</tr>
<tr>
<td>Paper – VII</td>
<td>Lab – Web Designing and use of Internet</td>
<td>50</td>
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ANNUAL SYSTEM

Part – III:

<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Paper</th>
<th>Max. Marks</th>
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</thead>
<tbody>
<tr>
<td>Paper–I</td>
<td>Computer Networks</td>
<td>100</td>
</tr>
<tr>
<td>Paper–II</td>
<td>Software Engineering</td>
<td>100</td>
</tr>
<tr>
<td>Paper–III</td>
<td>Operating System</td>
<td>100</td>
</tr>
<tr>
<td>Paper–IV</td>
<td>Computer Graphics</td>
<td>100</td>
</tr>
<tr>
<td>Paper–V</td>
<td>Programming Lab</td>
<td>(50+50) 100</td>
</tr>
<tr>
<td>Paper–VI</td>
<td>Project</td>
<td>300</td>
</tr>
</tbody>
</table>
Bachelor of Computer Applications (Semester – I)

Paper–I: Introduction to Programming (C) - I

Time: 3 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 student can use only Non–programmable & Non–storage type Calculator.

UNIT-I

Logic Development and Program Development Tools: Data Representation, Flowcharts, Problem Analysis, Decision Trees/Tables, Pseudo code and algorithms.

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


UNIT-II

Data Input and Output: single character Input, single character output, entering input data, more about scan functions, writing output data, more about print functions, gets and puts functions, interactive programming.

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

UNIT-III

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

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

References:

1. Balaguruswamy: “Programming in ANSI C”.
2. Scuaum Outline Series: “Programming in C”.
3. Dennis & Ritchie: “Programming in C”.
Bachelor of Computer Applications (Semester – I)

Paper–II: Introduction to Computers and Information Technology

Time: 3 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 student can use only Non–programmable & Non–storage type Calculator.

UNIT-I

Introduction to Computers and its Applications:
Computer as a system, basic concepts, functional units and their inter relation.
Milestones in Hardware and Software.
Batch oriented / on–line / real time applications.
Application of computers.

UNIT-II

Interacting with the Computer:
Input Devices: Keyboard, mouse, pens, touch screens, Bar Code reader, joystick, source data automation, (MICR, OMR, OCR), screen assisted data entry: portable / handheld terminals for data collection, vision input systems.
Output Devices: Monitor, Serial line page printers, plotters, voice response units.
Data Storage Devices and Media: Primary storage (Storage addresses and capacity, type of memory), Secondary storage, Magnetic storage devices and Optical Storage Devices

UNIT-III

MS–Word: 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

MS–Power Point: Presentation overview, entering information, Presentation creation, opening and saving presentation, inserting audio and video

Text/References:
2. Introduction to Computers – N. Subramanian.
3. Introduction to Computers – Peter Norton Mcgraw Hill.
4. MS–Office – BPB Publications.
Paper – III: Mathematical Foundation of Computer Science

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

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

UNIT-II

Set Theory, Relation: Elements of a set, methods of describing a set, types of sets, operation on sets – union, intersection and difference of sets, Venn diagrams, statement problems, Associative laws, Distributive laws, DeMorgan’s laws, duality, partitioning of a set. Basic definition of Relation and types of relations, graphs of relations, properties of relations (domain, range, inverse and composite relations).

UNIT-III

Differentiation and Integration: Laws of derivative, Chain rule, Differentiation using log, repeated derivatives, derivatives of implicit functions. Integration of algebraic, Logarithmic and Exponential function, Integration of functions using partial fraction (Simple form using properties), Integration of functions by parts, Definite integral

Probability: Mathematical and Statistical probability, axiomatic approach to probability, Elementary events, Sample space, Compound events, Types of events, Mutually exclusive, Independent events, addition law of probability, Conditional probability, Multiplication theorem of probability, Baye’s Theorem.

Books Recommended:
2. Higher Engineering Mathematics by B.S. Grewal
PAPER – IV: COMMUNICATION SKILLS – I

Time: 3 Hours

Max. Marks: 50
Theory Marks: 35
Practical Marks: 15

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

3. **Listening Skills**: Barriers to listening; effective listening skills; feedback skills. Attending telephone calls; note taking.

   **Activities:**
   a) Listening exercises – Listening to conversation, News/TV
   b) Taking notes on a speech/lecture

   a. **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.

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

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

   Sultan Chand
   Orient Blackswan
4. Handbook of Practical Communication Skills; Clarissa Wright (Ed). JAICO Books
5. Spoken English: A Foundation Course (Part I and II) by Kamlesh Sadanand and Sushila
   Punitha. Orient Blackswan (for recorded conversation)

Suggested Pattern of Question Paper:

The question paper will consist of seven skill–oriented questions from Reading and Writing
Skills. Each question will carry 5 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) 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

iv) Official/Business correspondence

v) Making point-wise notes on a given speech/ technical report

vi) Writing notices for public circulation on topics of professional interest

vii) Do as directed (5x1=5 marks) (change of voice, narration, combination of 2 simple
     sentences into one, subject-verb agreement, using appropriate tense, forms of verbs.
     (7x5=35 marks)
Practical /Oral Testing

Contents:
1. Conversation with students or examiner.
2. Listening to any recorded or live material and asking oral questions for listening comprehension.

Questions:
1. Students may be asked to engage in face-to-face conversation with other students or examiners on topics of general interest.
2. Students may be asked to prepare for one minute and then speak for one to two minutes on a simple topic with examiners as the audience.
3. A teacher or examiner may read out a small passage and the students may be asked to answer a couple of comprehension questions. (recorded material may also be used)

Note: Oral test will be conducted by external examiner with the help of internal examiner. The oral test examiner will be appointed from those teachers who are actually teaching the subject.
Paper-V: भौतिकी (समानभाषी)

भाग : 3 पृष्ठ  कुल अंक : 50

पाठ-बुध अंक पाठ-प्रश्नवां

1. विज्ञान भवन (विज्ञानकला उ गणना-विज्ञानकला लेख का मंडीत्र)
(मधु. ज्ञ. माउंटेन मिश्र, इ. माउंटेन मिश्र व्याख्यात), वारुं तत्त्व रूप धूमधाममी, अभिन्नमां, 2007
लेख : धीरेश मुखमट, बनर्जी देओल दे तेज सिंह, दांडी महान, लंजोकी धूमधाम अंि
अध्ययन, अंि : छोटा स्वरूप शब्द।

2. भौतिकी दे भवन विज्ञान (वस्तुधार गावाली), वारुं तत्त्व रूप धूमधाममी, अभिन्नमां।
लेख : अभिन्न मेलिंडाल, वेंकलमधिलाक, घाटे धमधाम भली भ. मंत्र मिश्र, दिपकीदाब घुटळ, भजी मधुष मिश्र

3. शेष उम्मीद

4. शेष वद दे भूमतो दे अंिवर।

5. (ष) भौतिकी युती विभुति : दुहार भवन, दुहार सरणे दे विद्यालय, महत, विमोद, मंत्र।
(अ) दुहार वेतलीवां : दुहार ए दोलरी तृत, दुहार अंिे दुहार-दुहार ए अंिवर, दुहारी
दुहाराबाद दे वारुं-विभुति।

6. भवन दुहार ए विलापगत
(ष) भवनी दुहार दे उंि धुने
(अ) दुहारी दुहार दे उंि धुने

अंि वेंि अंिे वतीयशायर भवी उदाहरण

1. विमे विभुति ए भवन से तुम्हारे विभुति वादु (दे दिक्षि दिख)। 10 अंिवर
2. दुहार वारुं : देश विभुति, तासिल विभुति, वारुंबाब तुर्क, तेश विभुति
माउंटेन हूं छेठ । 10 अंिवर
3. शेष उम्मीद : छोटा विभुति दिखिे, विमे दिख हुिे शेष दिक्षि शरीी
विभुति करिे। 5 अंिवर
4. शेष ए दे विभुति वहुं भवन धुनो दे अंिवर । 5 अंिवर
5. शेष 5 धुिे दिक्षि विभुति ए भवन दे दुहार भवन प्रश्न । 10 अंिवर
6. शेष 6 दिक्षि भवन दे भवनी दुहार अंिे दुहारी दुहार ए विलापगत, भवनी दुहारे वतीयशायर भवी
विभुति करिे, भवनी दुहारी दुहारी दे दे दुहार देखा देखिा। 5×2=10 अंिवर
1. पंजाबी भाषा
   गुजराती लिखी
   गुजराती लिखी : बहुधावा रहे उद्दीय
2. गुजराती आचार्यांक
   मूर्ति सी बंद अते दिशाचार
   विशेषतः सी बंद अते दिशाचार
3. पंजाबी सम्प-बहुधावा अते उद्दी
   मापक सार
   हिंदी देशें सी पंजाबी समस्तसी

पृष्ठ अंक : 50

1. पंजाबी भाषा : तम्बडव अते संधेश नाट पंडट, गुजराती लिखी : तम्बडव, गुजराती दिशाचार; वेढी अध्यापी, अभिसूची भ, मूर्ति (ऱ अ र), लगा भारत, देखिं चिह निकस नाट, देखिं चिह ग्रेट लक्ष वट, देखिं चिह ही आज, देखिं चिह, तिथिक, शक्ति, आजळ।
2. गुजराती आचार्यांक अते दिशाचार ; मूर्ति सी बंद अते दिशाचार (खयु-दीवा मूर्ति) ; मूर्ति मोंल उन्नई भारत; विशेषतः सी बंद अते दिशाचार ; देखिं चिह ग्रेट लक्ष वट (ऱ, र, र) रा दिशाचार ; त अभिसूची रा दिशाचार ; र, र, र, र रा दिशाचार; देखिं चिह निकस नाट, देखिं चिह निकस नाट, देखिं चिह निकस नाट, देखिं चिह निकस नाट, देखिं चिह निकस नाट.
3. पंजाबी सम्प-बहुधावा अते उद्दी : मापक सार; निवैचार मूर्ति (निवैचार अन्न); मूर्ति मोंल विशेषत (निवैचार अन्न); विशेषतः मूर्ति मोंल विशेषत (निवैचार अन्न); पंजाबी सम्प-बहुधावा; विशेष-पूर्विक, देख दिश-शु वट; हिंदी देशें सी पंजाबी समस्तसी; धर-पौड अते मापक सार संस्करणः

वर्ग-बंद अते परिभाषा राशी प्रश्नावली:
1. पहिले युक्तित दिनें पंजाबी भाषा अते गुजराती लिखी सी बहुधावा अते उद्दीय राह संस्करण 5-5 अंक दे युक्तित धुमक पुस्तक सादोः अंकां सी बंद अंकां दिव-दिव त्या े-े अंक दे ब्रेटे पुस्तक दिव तीती सा संस्करणः
2. दुस्रे युक्तित दिनें गुजराती आचार्यांक अते दिशाचार राह संस्करण 5-5 अंक दे दिव धुमक पुस्तक पुक्ते सादोः अंकां सी बंद अंकां दिव-दिव त्या े-े अंक दे ब्रेटे पुस्तक दिव तीती सा संस्करणः
3. तीस्रे युक्तित दिनें पंजाबी सम्प-बहुधावा अते उद्दीय राह संस्करण 5-5 अंक दे दिव धुमक पुस्तक पुक्ते सादोः अंकां सी बंद अंकां दिव-दिव त्या े-े अंक दे ब्रेटे पुस्तक दिव तीती सा संस्करणः
4. चतुर्थ दिनें सी पंजाबी समस्तसी राह संस्करण दिव-दिव अंक दे पूस्तक (आयमैनिटिक) पुस्तक पुक्ते सादोः
5. पुस्तक दी पंजाबी समस्त अते मापक सार नाटे।
Operational Knowledge of:

1. C Programming

2. Windows Based Operating System

3. MS – OFFICE (Word and Power Point)
Paper–I: Introduction to Programming (C) - II

Time: 3 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 student can use only Non–programmable & Non–storage type Calculator.

Strings: String declaration, string functions and string manipulation

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

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

Data Files: Opening, closing, creating, processing and unformatted data files.

References:

1. Balaguruswamy: “Programming in ANSI C”.
2. Scaum Outline Series: “Programming in C”.
3. Dennis & Ritchie: “Programming in C”.
Paper–II: Principles of Digital Electronics

Time: 3 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 student 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 Bookean expressions, K-Map

UNIT-II
Combinational Circuits: Adder, Subtractor, Multiplexer, Demultiplexer, Decoer, 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.
Paper–III: Numerical Methods & Statistical Techniques

Time: 3 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 student can use only Non–programmable & Non–storage type Calculator.

Note for Paper Setter:
I. That the program for numerical and statistical methods are to be written in C.
II. Paper setter indicating thereby that the greater weightage is to be given to exercises rather than theoretical derivation of all numerical and statistical methods.

UNIT-I

Introduction:
1. Numerical Methods, Numerical methods versus numerical analysis, Errors and Measures of Errors.

UNIT-II

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.
3. Correlation.

Books Recommended:
Contents:

1. **Reading Skills**: Reading Tactics and strategies; Reading purposes—kinds of purposes and associated comprehension; Reading for information given and implied; Inferential reading, critical reading and interpretation; connotation and understanding tone; paraphrasing, gist and central idea;

   **Activities:**
   a) Active reading of learned passages on academic and professional topics
   b) Short comprehension questions on implied meanings
   c) Reading outcome including paraphrasing and summary writing.

2. **Writing Skills**: Guidelines for effective writing; writing styles for paragraphs/short essays of expository and argumentative nature; academic and technical reports, style, arrangement, variety of illustrations, diagrams, tables, charts etc., main section, appendices, conclusion, list of references; outline, synopsis, revision.

   **Activities:**
   a) Writing of paragraph/short essay on learned and professional topics
   b) Organising ideas/arguments in a logical order
   c) Writing a brief report on the given data, diagram, chart etc.

3. **Listening Skills**: Barriers to listening; effective listening skills; feedback skills. Attending telephone interviews; transcoding and note taking.

   **Activities:**
   a) Listening exercise – Listening to Conversation, News/TV, group discussion, long speech
   b) Making notes on conversation, group discussion and lectures.

4. **Speaking and Discussion Skills**: Components of an effective talk/presentation; planning and organizing content for a talk/presentation, use of visual aids, effective speaking skills, discussion skills.

   **Activities:**
   a) Making presentation to a group on a given topic.
   b) Participating in a group discussion.
   c) Making slides for PowerPoint presentation or other audio-visual aids.
Recommended Books:

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

Suggested Books:

4. Handbook of Practical Communication Skills; Clarissa Wright (Ed). JAICO Books
5. Spoken English: A Foundation Course (Part I and II) by Kamlesh Sadanand and Sushila Punitha. Orient Blackswan (for recorded conversation)

Suggested Pattern of Question Paper:

The question paper will consist of seven skill-oriented questions from Reading and Writing Skills. Each question will carry 5 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) Short answer comprehension questions on an unseen passage on a learned topic
ii) Making summary/ précis or paraphrasing of ideas of a given passage
iii) Writing a paragraph of expository or argumentative nature on a given topic
iv) Interpreting a given data, chart, diagram etc and making a brief report
v) Transcoding (given dialogue to prose or given prose to dialogue)
vi) Making given number of slides for a presentation on a given topic
vii) Do as directed (5x1=5 marks) (change of voice, narration, combination of 2 simple sentences into one, subject-verb agreement, using appropriate tense, forms of verbs. (7x5=35 marks)
Practical /Oral Testing

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. The oral test examiner will be appointed from those teachers who are actually teaching the subject.
PAPER-V: प्रौद्योगिकी (स्नातकीय)

भाग : 3 पट्टे

पप्ट-ब्यू है यूपप्ट-यूम्फिब्ल–II

1. विभाग भाषा (विभागात्त्व द्वारा मान्य विभागात्त्व रेखांची संधी)
(मिश्र. डा. मार्तिन मिश्र. पू. भिन्नपण मिश्र गांधे), गुण गग गांध गुण गग गुण गग गगﻤांग, 2007
PAPER – V: ਸੂਚਨਾ ਪ੍ਰਬੰਧ
(In lieu of Compulsory Punjabi)

ਪ੍ਰਾਤ-ਤੁਗਮ

ਸੇਸ਼ਨ : ਵਿਦਾਲ ਪ੍ਲੇ

ਕੂਲ ਅੰਕ : 50

1. ਪ੍ਰਾਤਾਂਵੀ ਸੱਕਟ-ਬਰੱਣਿਆ
ਮੁਦੂਰਵਾ ਅਨੀ ਭਿਨਵਰ ਸੱਕਟ
ਕੀਬੁਰ ਬਰਵੇ ਦੀ ਪ੍ਰਾਤਾਂਵੀ ਸੱਕਟਰਵਲੀ

20 ਅੰਕ

2. ਪ੍ਰਾਤਾਂਵੀ ਰੱਧ-ਬਰੱਣਿਆ
ਸਮਕਸ਼ ਰੱਧ : ਵਿਨੰਗ
ਮੁਦੂਰਵਾ ਰੱਧ : ਵਿਨੰਗ
ਭਿਨਵਰ ਰੱਧ : ਵਿਨੰਗ
ਪ੍ਰਾਤਾਂਵੀ ਰੱਧ ਦੀ ਬਰਵੇ ਦੀ ਵਿਚਿੱਤ ਸਮਾਸੀਤ ਪੁਸਤਕ

15 ਅੰਕ

3. ਪ੍ਰਾਤਾਂਵੀ ਪ੍ਰਬੰਧ
ਵਿਨੰਗ ਤੁਪਾ
ਅਰਥ ਅਨੀ ਪੁਰਾਣੀ

15 ਅੰਕ

ਪ੍ਰਿਕਟ ਅਤੇ ਵਿਭਾਗ:

1. ਪ੍ਰਾਤਾਂਵੀ ਸੱਕਟ-ਬਰੱਣਿਆ: ਮੁਦੂਰਵਾ ਸੱਕਟ; ਸੰਸਿਧਿ ਸੱਕਟ (ਸੈਕੇ ਦੀ ਵਿਚਿੱਤ ਸੱਕਟ); ਰੱਧੇ ਸੱਕਟ/ਪੁਰਾਣੀ ਸੱਕਟ (ਸੈਕੇ ਦੀ ਵਿਚਿੱਤ ਸੱਕਟ), ਭਿਨਵਰ ਸੱਕਟ: ਭਿਨਵਰ ਸੱਕਟ ਤਰੱਕ; ਕੁਮਾਰੀ ਤੁਪਾ, ਵਿਚਿੱਤ ਸਮਾਸੀਤ ਵਿਚਿੱਤ ਦੇ ਤੁਪਾ; ਕੀਬੁਰ ਬਰਵੇ ਦੀ ਪ੍ਰਾਤਾਂਵੀ ਸੱਕਟਰਵਲੀ; ਤੁਪਾ, ਵਿਚਿੱਤ ਸਮਾਸੀਤ, ਸੈਕੇ, ਵਟਾਲੀ ਰਾਲ ਸਮਾਸੀਤ।

2. ਪ੍ਰਾਤਾਂਵੀ ਰੱਧ-ਬਰੱਣਿਆ : ਬਰਵੇ ਬਰਵੇ ਵਿਚਿੱਤ; ਸਮਕਸ਼ ਰੱਧ, ਵਿਚਿੱਤ ਸਮਾਸੀਤ, ਪੁਸਤਕਰਚਾਲਕ, ਆਸਟਾਂਵਾਰਚਾਲਕ; ਮੁਦੂਰਵਾ ਅਨੀ ਭਿਨਵਰ ਬਰਵੇ ਦੀ ਬਰਵੇ ਦੀ ਵਿਚਿੱਤ ਸਮਾਸੀਤ ਵਿਚਿੱਤ; ਸੂਖਰਮ ਅਨੀ ਸੈਕੇ ਦੀ ਵਿਚਿੱਤ; ਪ੍ਰਾਤਾਂਵੀ ਰੱਧ ਦੀ ਬਰਵੇ ਦੀ ਵਿਚਿੱਤ ਸਮਾਸੀਤ/ਐਵਾਂਕਾ ਪੁਸਤਕ; ਬਰਵੇ ਦੀਆਂ ਵਿਚਿੱਤ ਸੈਕੇ, ਵਿਚਿੱਤ ਸੈਕੇ, ਸਿੰਮੇਲੀ ਤਰੱਕ/ਸਮਾਸੀਤ ਵਿਚਿੱਤ, ਵਿਚਿੱਤ ਵਿਚਿੱਤ, ਪੁਰਾਣੀ ਸੱਕਟਰਵਲੀ ਵਿਚਿੱਤ, ਰੂਪਾਂ ਰਾਲ ਵਿਚਿੱਤ।

3. ਨੰ ਪ੍ਰਿਕਟ ਵਿਚਿੱਤ ਵਿਚਿੱਤ ਪੁਸਤਕ (ਸੈਕੇ/ਬਰੱਣਿਆ), ਪ੍ਰਾਤ ਅਨੀ ਅਰਥ ਮਿਰਾਮਿਰ ਸੀ ਬਰਵੇ ਦੀ ਵਿਚਿੱਤ ਸਮਾਸੀਤ ਦੀ ਅਵਾਨਿਆਂ ਪੁਰਾਣੀ ਤੁਪਾਂ ਦੂਰ ਪੁਸਤਕ ਤੋਂ ਨਾਵਾਂ ਸੌਨੇਂ।

ਅਧ-ਬੰਧ ਅਤੇ ਪਬਲਿਕੇਸ਼ਨ ਸਮੀਤਾ ਉਪਦੇਸ਼ਣ:

1. ਪਲੈਲ ਪ੍ਰਿਕਟ ਵਿਚਿੱਤ ਪ੍ਰਾਤਾਂਵੀ ਸੱਕਟ-ਬਰੱਣਿਆ ਅਨੀ ਸੱਕਟ ਤਰੱਕ ਤਰੱਕ ਸਮਾਸੀਤ 5-5 ਅੰਕ ਦੇ ਵਿਚਿੱਤ ਪੁਸਤਕ ਪੁਸਤਕ ਲਈ। ਅਨੀ ਤੁਪਾ ਅਨੀ ਵਿਚਿੱਤ ਤੁਪਾ ਔਰ ਅੰਕ ਦੇ ਕੀਬੁਰ ਵਿਚਿੱਤ ਤੋਂ ਸੁਚੀ ਦੇ ਹੈ।

2. ਕੀਬੁਰ ਬਰਵੇ ਦੀ ਸਮਾਸੀਤ ਤਰੱਕ ਸੁਣਾਈ ਵਿਚਿੱਤ ਤੁਪਾ ਔਰ ਪੁਸਤਕ (ਨਵੀਨਬੰਧਣ) ਪੁਸਤਕ ਪੁਸਤਕ ਲਈ।

3. ਪੁਰਾਣੀ ਪ੍ਰਿਕਟ ਵਿਚਿੱਤ ਪ੍ਰਾਤਾਂਵੀ ਸੱਕਟ-ਬਰੱਣਿਆ ਸਮਾਸੀਤ 5-5 ਅੰਕ ਦੇ ਵਿਚਿੱਤ ਪੁਸਤਕ ਪੁਸਤਕ ਲਈ। ਅਨੀ ਤੁਪਾ ਅਨੀ ਵਿਚਿੱਤ ਤੁਪਾ ਔਰ ਅੰਕ ਦੇ ਕੀਬੁਰ ਵਿਚਿੱਤ ਤੋਂ ਸੁਚੀ ਦੇ ਹੈ।

4. ਪ੍ਰਾਤਾਂਵੀ ਰੱਧ ਦੀ ਵਿਚਿੱਤ ਬਰਵੇ ਤਰੱਕ ਸਮਾਸੀਤ 5 ਅੰਕ ਦੇ ਵਿਚਿੱਤ ਪੁਸਤਕ ਸੌਨੇਂ ਸੈਕੇ ਨਾਮ ਤਰੱਕ ਵਿਚਿੱਤ ਤੋਂ ਸੁਚੀ ਦੇ ਹੈ।

5. ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ}

6. ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ

7. ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ ਨੰ ਵਿਚਿੱਤ

8. ਪੁਸਤਕ ਦੀ ਪੁਸਤਕ ਮਾਲ ਅਨੀ ਸਮਾਸੀਤ ਤਰੱਕ ਲਈ।

Bachelor of Computer Applications (Semester – II)

PAPER – V: ਸੂਚਨਾ ਪ੍ਰਬੰਧ
(In lieu of Compulsory Punjabi)
Operational Knowledge and Implementation of Numerical Methods & Statistical techniques using C language.
Bachelor of Computer Applications (Semester - III)

Paper – I: Computer Architecture

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

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.

UNIT-II

CPU Design Stack Organized CPU, Instruction Formats, Addressing Modes, Program Control,
Hardwired & Microprogrammed (Wilhe’s Design) Control Unit.

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

UNIT-III

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:
Computer System Architecture: M.M. Mano (PHI)
Computer Architecture: J.P. Hayes.
Computer Architecture: Patterson & Hemessy.
Bachelor of Computer Applications (Semester - III)

Paper – II: Database Management System & Oracle

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.
2. The students can use only Non–Programmable & Non–Storage Type Calculators.

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.

UNIT-II
DBA, responsibilities of DBA, Relational form like INF, 2NF, 3NF, BCNF, 4th NF, 5th NF, DBTG, concurrency control and its management, protection, security, recovery of database.

UNIT-III
ORACLE 10g
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 10g.


Books:
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
Bachelor of Computer Applications (Semester - III)

Paper – III: C++ (OOP Language)

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.

2. The students can use only Non–Programmable & Non–Storage Type Calculators.

UNIT-I

1 Getting Started

1.1. Introduction.
1.2. A brief history of C++
1.3. Variable, constant, Expression, Statements, Comments and keywords of C++
1.5. Data type, Type Conversion, library function.

2 Input / Output Statements

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

3 Decision Making and Looping Statement

3.1. If Statement, If..else statement, nesting of if statement, switch statement, conditional operator statement.
3.2. While loop, do loop, for loop, nesting of loops, break and continue statement, go to statement.

UNIT-II

1 Arrays

1.1. Defining an array, array type, array elements, Accessing and averaging array elements, initializing array.
1.2. Programming of C++ with array.
1.3. String handling, array of strings.
2 Functions

5.1. What is a function?
1.2. Declaring and defining function.
1.3. Local, global variables, execution of function.
1.4. Passing argument to function.
1.5. Return values.
1.6. Reference arguments.
1.7. Overloading functions.
1.8. Inline function and default parameter.
1.9. Variable and storage classes.

UNIT-III

1 Object Oriented Programming

1.1. Objects & Classes.
1.2. Constructor & Destructor.
1.3. Operator overloading.
   a) Overloading unary operators.
   b) Overloading binary operators.
   c) Data conversion.
   d) Pitfalls operator overloading and conversion.
1.4. Inheritance
   a) Derived class and Base Class.
   b) Derived Class Constructors.
   c) Overriding member functions.
   d) Inheritance in the English distances class, class hierarchies.
   e) Public and Private inheritance.
   f) Level of inheritance.
1.5. Polymorphism
   a) Problems with single inheritance.
   b) Multiple inheritance.

2 Structures

7.1. A simple structure, specifying the structure, defining a structure variable.
7.2. Accessing Structure member.
7.3. Other structure features.
7.4. Structure within structure.
7.5. Structure and classes.
7.6. Arrays of structure.

Books:
1. C++ & Graphics by Vijay Mukhi’s
2. Turbo C++ by Robert Lafore.
PAPER-IV: ENVIRONMENTAL STUDIES-I

Theory Lectures: 1.5 Hours/ Week
Time of Examination: 3 Hours

Max. Marks: 50

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:
   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 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.

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.
Introduction, types, characteristic features, structure and function of the following ecosystems:
   a. Forest ecosystem
   b. Grassland ecosystem
   c. Desert ecosystem
   d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

4. 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.

References/Books:
3. Down to Earth, Centre for Science and Environment, New Delhi.
9. Booklet on Safe Driving. Sukhmani Society (Suvidha Centre), District Court Complex, Amritsar
Paper – V
(Programming Lab-I)

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

Paper – VI
(Programming Lab-II)

Lab – II: Practical in Oracle : 25 Marks
Paper – I: Data Structures and File Processing

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.
2. The students can use only Non–Programmable & Non–Storage Type Calculators.

UNIT-I


UNIT-II

Searching Techniques: Linear and Binary Search.

Sorting Techniques: Bubble Sort, Selection Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort.

UNIT-III

File Organization: Concept of field, record, file, blocking and compaction.

File Organization Techniques: Sequential, indexed, indexed sequential, Direct, Hashing. Concept of master and transaction files.

Text/References:
1. Data Structure – Seymour Lipschutz, Schaum Outline Series.
2. File Structure & Data Structures by E. Loomis.
3. Data Structures by Trabley & Soreuson.
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 students can use only Non–Programmable & Non–Storage Type Calculators.

UNIT-I

Fundamental aspects of Information, Capturing of Information, Converting Information to Computer – readable form, source of Information, on–line Information access and capture.

UNIT-II


Technologies for Information System: Latest trends in Hardware and Software.

UNIT-III

Various types of information systems: Transaction processing systems, office Automation systems, MIS and decision support system.

Case studies of the Information System: Accounting Information systems, Inventory control systems & Marketing systems.

References:

Bachelor of Computer Applications (Semester - IV)

Paper – III: 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.

2. The students can use only Non–Programmable & Non–Storage Type Calculators.

UNIT-I
Introduction: About internet and its working, business use of internet, services offered 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 e–mail message, working of e–mail (sending and receiving messages), managing e–mail (creating new folder, deleting messages, forwarding messages, filtering messages) Implementation of outlook express.

UNIT-II
Internet Protocol: Introduction, file transfer protocol (FTP), Gopher, Telnet, other protocols like HTTP and TCPIP.

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.

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

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

References:

Paper – IV: SYSTEM SOFTWARE

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.
2. The students can use only Non–Programmable & Non–Storage Type Calculators.

UNIT-I

Introduction to System Software
Introduction to System Software and its components
Translators, loaders, interpreters, compiler, assemblers

UNIT-II

Assemblers
Overview of assembly process, design of one pass and two assemblers

Macroprocessors
Macro definition and expansion, concatenation of macro parameters, generations of unique labels, conditional macro expansion, Recursive macro expansion

UNIT-III

Compilers
Phases of Compilation Process, Lexical Analysis, Parsing, Storage Management Optimization
Incremental Compilers, Cross Compilers.

Loaders and Linkage editors
Basic loader functions. Relocation, program linking, linkage, editors, dynamic linking, Bootstrap loaders

References:

PAPER–V: ENVIRONMENTAL STUDIES-II

Theory Lectures: 1.5 Hours/ Week      Max. Marks: 50
Time of Examination: 3 Hours

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 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.

2. 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.
3. 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
   Accident & First Aid: First Aid to Road Accident Victims, Calling Patrolling Police &
   Ambulance.

4. 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.

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:
3. Down to Earth, Centre for Science and Environment, New Delhi.
   Education (Singapore) Pte. Ltd., Delhi.
   International (P) Ltd, New Delhi.
9. Booklet on Safe Driving. Sukhmani Society (Suvidha Centre), District Court Complex,
   Amritsar
Bachelor of Computer Applications (Semester - IV)

Paper – VI: LAB - I

Time: 3 Hours  
M. Marks: 50

Lab – Data Structure implementation using C++

Paper – VII: LAB - II

Time: 3 Hours  
M. Marks: 50

Lab – Web Designing and use of Internet
Bachelor of Computer Applications (Part–III)

Paper – I: Computer Networks

Time: 3 Hours M. Marks: 100

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 students can use only Non–Programmable & Non–Storage Type Calculators.

1. **Introduction:** Network Definition, Basic components of a network, network types and topologies, Uses of computer networks, network architecture.

2. **Introduction to Analog and Digital Transmission:** Telephone system, Modems, Types of modems, pulse code modulation.
   Transmission & Switching: Multiplexing, circuit switching packet switching, hybrid switching, ISDN service transmission.

3. **Local Area Network Protocols:** CSMA Protocols, BRAP, MLMA, IEEE standards 602, Token Bus, Token Ring, FDDI.

4. **Data Link Layer Design Issues:** Services provided to Network layer framing, error control, flow control, link management. Error detection & correction, Elementary Datalink Protocols.

5. **Design Issues of Network Layer:** Services provided to transport layer, routing, connection, internet & world wide web.

6. **Network Security and Privacy:** Brief Introduction to Cryptography.

7. **Network Services:** File transfer, Access & Management, Electronic Mail, Remote logic

References:
5. Link, Data Network (PHI), 1968.
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 students can use only Non–Programmable & Non–Storage Type Calculators.

1. **Introduction to Software**: Definition, Software characteristics, Software components, Software Applications.


3. **Software Metrics**: Role of Metrics and measurement, Metrics for software productivity and quality, Measurement software, size–oriented metrics, function oriented metrics, Metrics for software quality, Integrating metrics within the software engineering process.

4. **Software Requirement Specification (SRS)**: Problem analysis, structuring information, Data flow diagram and data dictionary, structured analysis, Characteristics and component of (SRS), Metrics of SRS, function point, Number of errors and found, change request frequency.


7. **Detailed Design**: Module specification, Specifying functional module, specifying data abstraction, PDL and Logic/Algorithm Design.

8. **Coding**: Coding by Top–down and Bottom–up, Structured Programming, Information Hiding, Programming style, Internal Documentation.


**References:**

2. Integrated Approach to Software Engineering, Pankaj Jalote
Time: 3 Hours                         M. Marks: 100

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 students can use only Non–Programmable & Non–Storage Type Calculators.


2. **Processes**: Process concepts, Process Scheduling, threads.

3. **CPU–Scheduling**: Basic concepts, scheduling criteria, scheduling algorithms, algorithm evaluation.


5. **Memory Management**: Background, Logical v/s Physical address space, swapping, continuous allocation, paging, segmentation.


7. **Secondary Storage Structures**: Disk structures, Disk scheduling, Disk Reliability.

8. **Deadlocks**: System Model, Deadlock characterization, methods for handing deadlocks, Deadlocks Prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock, combined approach to deadlock handling.

**References:**

Bachelor of Computer Applications (Part–III)

Paper – IV: Computer Graphics

Time: 3 Hours                      Total Marks: 100

Note 1: The paper setter is required to set eight questions in all and the candidates will be required to attempt any five. All questions carry equal marks.
2. The students can use only Non–Programmable & Non–Storage Type Calculators.

Computer Graphics and their applications.

Overview of Graphics system.

Display Devices: CRT Monitors (Random – Scan and Raster Scan, DVST, Plasma – Panel Display, LED and LCD Monitors.

Graphics Software.

Elementary Drawing: Points and various line drawing Algorithms and their comparisons efficiency contact.

Cycle generating algorithms

Other objects like ellipses, arcs, section spirits.

Two Dimensional Transformations: Basic Transformations. Ceiling, Translation, Rotation, Deflection, Sherw Matrix representation of Basic transformations and homogenous coordinates.

Composite Transformations.


Implementation in C: C programming for drawing 2 D objects – line rectangle, arc., circle and ellipse. C Programming for 2–D and 3–D transformations which include translation, rotation, scaling, reflection and shear.

References:

Paper–V

Programming Laboratory

Time: 3 Hours

<table>
<thead>
<tr>
<th>Lab</th>
<th>Description</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab I</td>
<td>Applications of Computer Graphics in C++/C</td>
<td>50</td>
</tr>
<tr>
<td>Lab II</td>
<td>Operational Knowledge of UNIX/Windows NT</td>
<td>50</td>
</tr>
</tbody>
</table>
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 January 31.
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 by the following panel of examiners prior to the theory examination:
   a) Internal Examiner
   b) External Examiner (to be appointed by the University, as is done in the practicals)
   c) Head, Department of Computer Science & Engineering, Guru Nanak Dev University, Amritsar or his/her nominee.