FACULTY OF ENGINEERING & TECHNOLOGY

SYLLABUS

FOR

BACHELOR OF COMPUTER APPLICATIONS
(Semester: I–VI)

Session: 2019-20

GURU NANAK DEV UNIVERSITY
AMRITSAR

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### SEMESTER – I:

<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Paper</th>
<th>M. Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper – I</td>
<td>Introduction to Programming – C</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>Applied &amp; Discrete Mathematics</td>
<td>75</td>
</tr>
<tr>
<td>Paper – IV</td>
<td>Practical–I (MS Office 2010 and Basic C Programming)</td>
<td>75</td>
</tr>
<tr>
<td>Paper – V</td>
<td>Communication Skills in English – I</td>
<td>50</td>
</tr>
<tr>
<td>Paper – VI</td>
<td>Punjabi (Compulsory) / <strong>ਪੰਜਾਬੀ ਪ੍ਰਾਪਤਕਾਰ</strong> /</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td><strong>Punjab History &amp; Culture (From Earliest Times to C 320)</strong></td>
<td></td>
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<tr>
<td>Paper – VII</td>
<td>* Drug Abuse: Problem, Management and</td>
<td>50</td>
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<tr>
<td></td>
<td>Prevention (Compulsory Paper)</td>
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### SEMESTER – II:

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<tr>
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</thead>
<tbody>
<tr>
<td>Paper – I</td>
<td>Introduction to Programming – C++</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>
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<tr>
<td>Paper – IV</td>
<td>Practical – I (Advanced C++ Programming)</td>
<td>75</td>
</tr>
<tr>
<td>Paper – V</td>
<td>Communication Skills in English – II (Th.35+Pr.15)</td>
<td>50</td>
</tr>
<tr>
<td>Paper – VI</td>
<td>Punjabi (Compulsory) / <strong>ਪੰਜਾਬੀ ਪ੍ਰਾਪਤਕਾਰ</strong> /</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td><strong>Punjab History &amp; Culture (C 320 TO 1000 B.C.)</strong></td>
<td></td>
</tr>
<tr>
<td>Paper – VII</td>
<td>* Drug Abuse: Problem, Management and</td>
<td>50</td>
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</tbody>
</table>

Note: * Marks of this Paper will not be included in the Total Marks.  
** (Special Paper in lieu of Punjabi Compulsory)  
(For those students who are not domicile of Punjab)
# Bachelor of Computer Applications

## SEMESTER – III:

<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Paper</th>
<th>M. Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper–I</td>
<td>Computer Architecture</td>
<td>75</td>
</tr>
<tr>
<td>Paper–II</td>
<td>Database Management System</td>
<td>75</td>
</tr>
<tr>
<td>Paper–III</td>
<td>Introduction to Python Programming</td>
<td>75</td>
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<tr>
<td>Paper–IV</td>
<td>Programming Lab – Python</td>
<td>50</td>
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<tr>
<td>Paper–V</td>
<td>Programming Lab – Oracle</td>
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</tr>
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</table>

## SEMESTER – IV:

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<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>
</tr>
<tr>
<td>Paper – II</td>
<td>Information Systems</td>
<td>75</td>
</tr>
<tr>
<td>Paper – III</td>
<td>Internet Applications</td>
<td>75</td>
</tr>
<tr>
<td>Paper – IV</td>
<td>System Software</td>
<td>75</td>
</tr>
<tr>
<td>Paper – V</td>
<td>Lab – Data Structures Implementation using C++</td>
<td>50</td>
</tr>
<tr>
<td>Paper – VI</td>
<td>Lab – Web Designing and use of Internet</td>
<td>50</td>
</tr>
<tr>
<td>Paper – VII</td>
<td>* Environmental Studies (Compulsory)</td>
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* Marks of Paper EVS will not be included in Grand Total.
### SEMESTER – V:

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Paper – I</td>
<td>Computer Networks</td>
<td>75</td>
</tr>
<tr>
<td>Paper – II</td>
<td>Web Technologies</td>
<td>75</td>
</tr>
<tr>
<td>Paper – III</td>
<td>Operating System</td>
<td>75</td>
</tr>
<tr>
<td>Paper – IV</td>
<td>JAVA Programming Language</td>
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</tr>
<tr>
<td>Paper – V</td>
<td>Lab based on JAVA Programming Language</td>
<td>50</td>
</tr>
<tr>
<td>Paper – VI</td>
<td>Lab based on ASP.NET</td>
<td>50</td>
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</tbody>
</table>

### SEMESTER – VI:

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</thead>
<tbody>
<tr>
<td>Paper – I</td>
<td>Computer Graphics</td>
<td>75</td>
</tr>
<tr>
<td>Paper – II</td>
<td>Software Engineering</td>
<td>75</td>
</tr>
<tr>
<td>Paper – III</td>
<td>Lab. Implementation of Applications of Computer</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Graphics in C++/C</td>
<td></td>
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<tr>
<td>Paper – IV</td>
<td>Project</td>
<td>200</td>
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</table>
Bachelor of Computer Applications (Semester – I)

Paper-I: INTRODUCTION TO PROGRAMMING - C

Time: 3 Hours M. Marks: 75

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

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

Section – B
Control Statements: Preliminaries, While, Do–while and For statements, Nested loops, If–else, Switch, Break – Continue statements.
Program Structure Storage Class: Automatic, external and static variables, multiple programs, more about library functions.

Section – C
Functions: Brief overview, defining, accessing functions, passing arguments to function, specifying argument data types, function prototypes, recursion.
Arrays: Defining, processing an array, passing arrays to a function, multi–dimensional arrays.
Strings: String declaration, string functions and string manipulation

Section – D
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.

References:
1. Balaguruswamy: “Programming in ANSI C”.
2. Saum Outline Series: “Programming in C”.
3. Dennis & Ritchie: “Programming in C”.

Paper–II: INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY

Time: 3 Hours  M. Marks: 75

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A
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.

SECTION–B
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.

SECTION–C
Data Storage Devices and Media: Primary storage (Storage addresses and capacity, type of memory), Secondary storage, Magnetic storage devices and Optical Storage Devices
Word Processor using Microsoft Office: 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

SECTION–D
Presentation Software using Microsoft Office: Presentation overview, entering information, Presentation creation, opening and saving presentation, inserting audio and video
Spreadsheet using Microsoft Office: Spreadsheet overview, Editing, Formatting, Creating formulas, Graphs.

Text/References:
2. Introduction to Computers – N. Subramanian.
3. Introduction to Computers – Peter Norton Mcgraw Hill.
4. MS–Office – BPB Publications.
6. Ebooks at OpenOffice.org
Bachelor of Computer Applications (Semester – I)

Paper III: APPLIED & DISCRETE MATHEMATICS

Time: 3 Hours

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

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

SECTION–B

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

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

References:
2. Kolman and Busby “Discrete Mathematical structures for Computer Sciences” PHI.
Bachelor of Computer Applications (Semester – I)

Paper – IV: Practical – I
(MS Office 2010 & Basic C Programming)

M. Marks: 75

Operational Knowledge of:

1. C Programming
2. Windows Based Operating System
3. MS – OFFICE (Word and Power Point)
Instructions for the Paper Setters:
 Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

The syllabus is divided in four sections as mentioned below:

**Section–A**

**Reading Skills:** Reading Tactics and strategies; Reading purposes–kinds of purposes and associated comprehension; Reading for direct meanings.

**Section–B**

Reading for understanding concepts, details, coherence, logical progression and meanings of phrases/expressions.

**Activities:**
- Comprehension questions in multiple choice format
- Short comprehension questions based on content and development of ideas

**Section–C**

**Writing Skills:** Guidelines for effective writing; writing styles for application, personal letter, official/business letter.

**Activities:**
- Formatting personal and business letters.
- Organising the details in a sequential order

**Section–D**

Resume, memo, notices etc.; outline and revision.

**Activities:**
- Converting a biographical note into a sequenced resume or vice-versa
- Ordering and sub-dividing the contents while making notes.
- Writing notices for circulation/boards

**Recommended Books:**
- *Oxford Guide to Effective Writing and Speaking* by John Seely.
- *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP
Bachelor of Computer Applications (Semester – I)

PAPER-VI: भौतिकी (संगठनी)

भाग : 3 पृष्ठ
मान : 50

भाग-चूड़ इंटर क्षेत्र-पमान

मैक्रो-डी

आउट भरारम (विशेष तरीका),
(मध्य. सूचक चीज अछे डिजाइन शिब नीदु)
इंटर लाइव टेस्ट युवीजियांटिरी. अधिकारियों
(भूमित्र विद्युत विभाग, मार्ग)

मैक्रो-डी

डीग्रेशन जांच (डीग्रेशन इंजन-सिद्धांत)
मध्य. म.ड.भरारम.
प्राभारी मानिस दृष्टि, दृष्टि-ओडो। (खंड 1 ते 6)

(खंडक पर मार्ग, विभाग-मैली)

मैक्रो-डी

(ट) खेती उपज
(आ) खेती पद्ध वे दृष्टि दे छूटें।

मैक्रो-डी

(ट) प्राकृतिक वस्तु डिष्टें : मिलकर गड़ा, मिलकर सफल दे डिलीां, महत, डिलीां, नेप-पुष्प।
(आ) वाम आकृतियाँ : वाम ने ट्राफालगर यूज, वाम अछे इन-इन ने वाम, प्राकृतिक इन-इन ग्राह्य दे पार्क-बिनु।

अन्य-सब अते परीक्षाधीन सभी उपरितिज्ज

1. भूमि पॉप दे सन जा से सुर।
2. डिलीां ही वेंट भूमि पॉप बचते गला।
3. उद्वेद भूमि दे बचत भर गला।
4. वेल्वेट सेल बनते दृष्टि में वह भूमि ही देंड अंतों देंड देंड जा छीं-पृष्ठ दिश वन मचवा दें।
PAPER–VI: ਮੂਰਤਲਿਆ ਪ੍ਰਕਾਸ਼
(In lieu of Compulsory Punjabi)

ਪ੍ਰਧਾਨ ਹੋਣੇਵਾਲੀਆਂ ਅਧਿਆਪਿਕਾਵਾਂ ਦੇ ਰੂਪ ਵਿਚ ਪ੍ਰਧਾਨ ਮੈਕਰਸਬਾਦ ਦੇ ਦੋ ਵਿਅੰਜਾਨ ਵੱਲ ਪ੍ਰਧਾਨ ਦਿਚ ਹੋਣ ਦਿਚ ਵਿਚ ਹੋਣ 

ਪ੍ਰਧਾਨ ਮੈਕਰਸਬਾਦ

ਪ੍ਰਧਾਨ ਸਬਾਚਾਲਣਾ: ਮੂਰਤਲਿਆ ਸਰਤ-ਪਹਾਣਾ
(ਸਰਤ ਸਰਤ, ਸਰਵਸਤ ਸਰਤ, ਭਿਸਤਕਰ ਸਰਤ, ਭੁਲਜ਼ ਸਰਤ, ਭਰੋਦਰ ਆਦੇ ਪਹੁੱਚਾਣ)

ਪ੍ਰਧਾਨ ਮੈਕਰਸਬਾਦ

ਹਿੰਦੀ ਉੱਤਰਾਲਾਗੀ ਪ੍ਰਕਾਸ਼ ਸਰਤ-ਪਹਾਣਾ : ਸੰਸਾਰ, ਰਾਸ਼ਟਰ, ਮਿਤਰੁਤਰ-ਰਾਤਰੇ, ਪੁੰਨੀ ਆਦੇ ਤਿੰਨ ਪ੍ਰਕਾਸ਼ਨ ਭਾਵ ਤਲਾਹਾਣ ਮੈਕਰਸਬਾਦ

ਸ਼ਾਸਤਰੀ ਉੱਤਰਾਲਾਗੀ 

ਉਠਾਇਆ ਦੇ ਮੱਠ ਪੋਸ਼ਣ ਦੇ ਹਾਂ, ਹੱਲੂਣ ਭਾਵਕਾਰਾਂ ਦੇ ਹਾਂ, ਹੁੱਕੁੰ ਦੇ ਹਾਂ, ਪ੍ਰਤ ਉੱਤਰ ਵਿਚ ਸਟਾਉ ਮੈਕਰਸਬਾਦ

ਸ਼ਾਸਤਰੀ ਉੱਤਰਾਲਾਗੀ

1. ਪੂਰਾਣ ਭੁਲਤ ਦੇ ਹਰ ਬਰਤਾਨ ਉੱਤਰ। 
2. ਹਿੰਦੀ ਪ੍ਰਕਾਸ਼ ਦੇ ਹਰ ਪੂਰੀ ਵਿਚ ਉੱਤਰ। 
3. ਹੁੱਕੁੰਟ ਪੂਰਾਣ ਦੇ ਹਰ ਵਿਚ ਉੱਤਰ। 
4. ਪੂਰਾਣ ਦੇ ਹਰ ਸਬਰੋਕਾਮ ਉੱਤਰ। 

ਘੰਨ-ਸੰਕੇਤ ਅਦਾ ਪ੍ਰਕਾਸ਼ਕਾਂ ਲਈ ਉਪਗਿਊਮਾਂ
Bachelor of Computer Applications (Semester – I)

PAPER–VI: Punjab History & Culture (From Earliest Times to C 320)
(Special Paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Time: 3 Hours Max. Marks: 50

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section–A
1. Physical features of the Punjab and its impact on history.
2. Sources of the ancient history of Punjab

Section–B
3. Harappan Civilization: Town planning; social, economic and religious life of the Indus Valley People.

Section–C
5. Social, Religious and Economic life during Rig Vedic Age.

Section–D
7. Teachings and impact of Buddhism
8. Jainism in the Punjab

Suggested Readings:
PAPER – VII: DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
(Compulsory Paper)

Problem of Drug Abuse

Time: 3 Hours
Max. Marks: 50

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section – A

Meaning of Drug Abuse:

Section – B

Consequences of Drug Abuse for:

- Family: Violence.
- Society: Crime.
- Nation: Law and Order problem.

Section – C

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

Section – D

Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
Social Management: Family, Group therapy and Environmental Intervention.
References:
Paper–I: INTRODUCTION TO PROGRAMMING - C++

Time: 3 Hours  

M. Marks: 75

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section–A

Programming Paradigms: Introduction to the object oriented approach towards programming by discussing Traditional, Structured Programming methodology.

Objects & Classes: Object Definition, Instance, Encapsulation, Data Hiding, Abstraction, Inheritance, Messages, Method, Polymorphism, Classes, Candidate & Abstract Classes to be examples of the Design process.

Section–B

Object Oriented Programming using C++: Characteristics of OOP, Overview of C++, I/O using cout and cin, Objects and Classes, Member functions and data, private & public, constructor & destructor, Constructor Overloading, Types of Constructors.

Section–C

Function Overloading: Function Overloading, Default Arguments, Ambiguity in Function Overloading.

Operator Overloading: Overloading unary and binary operators, Type Conversion using Operator Overloading

Section–D

Inheritance: Concept of inheritance, Base & derived classes, Access Specifiers, Class Hierarchies, Types of Inheritance with examples.

Virtual Functions and Polymorphism: Virtual functions, friend functions, static function, this pointer, polymorphism, Types of Polymorphism with examples, templates, class templates.

Books:
1. Teach Yourself C++, Herbert Schildth, Tata McGraw Hill.
2. Designing Object Oriented Software Rebeca Wirfs - Brock Brian Wilerson, PHI.
Bachelor of Computer Applications (Semester – II)

Paper–II: PRINCIPLES OF DIGITAL ELECTRONICS

Time: 3 Hours

M. Marks: 75

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A
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

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

SECTION–C
Combinational Circuits: Adder, Subtracter, Multiplexer, Demultiplexer, Decoeer, Encoder

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

SECTION–D
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.
Bachelor of Computer Applications (Semester – II)

Paper–III: NUMERICAL METHODS & STATISTICAL TECHNIQUES

Time: 3 Hours

M. Marks: 75

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
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.

Note for Candidate:
Attempt five questions in all by selecting one question from each section and the fifth question may be attempted from any sections. The students can use only Non–programmable & Non–storage type calculator.

SECTION–A

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

SECTION–B

1. Numerical Integration and different Trapezoidal Rule, Simpson’s 3/8 Rule.

SECTION–C

Statistical Techniques:
1. Measure of Central Tendency, Mean Arithmetic, Mean geometric, Mean harmonic, Mean, Median, Mode.
3. Correlation.

SECTION–D

1. Least square fit linear trend, Non–linear trend.
   \[ Y = ax^b \]
   \[ Y = ab^x \]
   \[ Y = ae^x \]
   Polynomial fit: \[ Y = a+bx+cn^2 \]

Books Recommended:
Operational Knowledge and Implementation of Numerical Methods & Statistical techniques using C++ language.
Time: 3 Hours

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

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Contents:

SECTION–A
Listening Skills: Barriers to listening; effective listening skills; feedback skills.
Activities: Listening exercises – Listening to conversation, News and TV reports

SECTION–B
Attending telephone calls; note taking and note making.
Activities: Taking notes on a speech/lecture

SECTION–C
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: 1) Making conversation and taking turns
2) Oral description or explanation of a common object, situation or concept

SECTION–D
The study of sounds of English,
Stress and Intonation,
Situation based Conversation in English,
Essentials of Spoken English.
Activities: Giving Interviews

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 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.
Bachelor of Computer Applications (Semester – II)

PAPER–VI: भौतिकी (सन्दर्भी)

भाग : 3 पृष्ठ
बुल इंट : 50

पाठ-वूँ अंश तथा पाठ-प्रमाण

मैथमेटिक्स

आउटल आउटल (लण्डन लाए),
(मूँ-वूँ की सी भाग तथा व्यापक तंत्र यथा)
बाहर तरीके द्वारा बिजलीकमिटी, कंप्यूटर अकादेमी।
(विशेष-विशेष, पाठ चित्र化工)

मैथमेटिक्स-शीशा

डिजिटल प्रत्येक (डिजिटल विद्युत-मंच)
मैथ. म.ब.बॉम्बे,
पंजाबी मात्र विज्ञान, विज्ञान। (खंड 7 ते 12)
(मात्र, लिखटक मैथी)

मैथमेटिक्स-शीशा

(3) संघ-विभाग अंश संघ तत्व : प्रविधिक, भूंचे मैथमेटिक्स
(अ) यह दुर्गा

मैथमेटिक्स-शीशा

(3) संघ तत्व
(अ) भूंचे अंश अंश

शैव-शैव अंश परीक्षाविहार सती उपाधियों

1. पृथक वॉल्ड के चम शता बॉक्स। उत्त वणज लिख दें पृथक भूंचे तत्व।
2. डिजिटलीकंप के दुर्ग भाग पृथक छवियों यथा। उत्त वणज लिख दें पृथक सन्दर्भी
3. धार्मिक पृथक दें व्यक्तिवाल भूंचे यथा।
4. पेपर मैंट चतुर्भुज चार प्रश्न दें उं पृथक चौंड भूंचे चौंद दें चौंद चतुर

हिंद-पृथक हिंद चतुर सन्दर्भी दें।
Bachelor of Computer Applications (Semester – II)

PAPER-VI: ਫ਼ੋਟੋਗਰਫੀ (In lieu of Compulsory Punjabi)

ਸਮ੃ਦ: 3 ਅੰਟੇ

ਚੁਣਾਵ ਅਂਕ: 50

ਪਨਾਚ-ਪੁਸ਼ਟ

ਮੈਵਰਲ-ਪ੍ਰਦ

ਮਖੂਸੀ ਮੂਲੀਆਂ : ਪਹਾੜ ਅਤੇ ਚਲਾਏ (ਰੈਸਟ, ਰੈਸਟਲੈਂਡ, ਲਿਕੀਸ਼ਨ, ਲੈਕਸ਼ਨਅ, ਲੈਕਸ਼ਨਅ ਲੈਕਸ਼ਨਅ, ਲਕਸ਼ਨਅ, ਲਕਸ਼ਨਅ ਲਕਸ਼ਨਅ)

ਮੈਵਰਲ-ਪ੍ਰਦ

ਪ੍ਰਸ਼ਨ ਦਵਾਰ ਸਰਦਾਰਦਾਰ : ਫ਼ੋਟੋਗਰਫੀ ਸਰਦਾਰ-ਸਰਦਾਰ

(੧) ਸਾਰਾਤ ਲਿਖਿਆ, ਮੁੱਖਤ ਦਵਾਰ ਅਤੇ ਭਿਸਮਦਾਰ ਦਵਾਰ (ਪਹਾੜ ਅਤੇ ਚਲਾਏ)

(੨) ਭਿਸਮਦਾਰ ਦਵਾਰ, ਪ੍ਰਤਿਵਾਰ ਦਵਾਰ ਅਤੇ ਪ੍ਰਤਿਵਾਰ ਦਵਾਰ (ਪਹਾੜ ਅਤੇ ਚਲਾਏ)

ਮੈਵਰਲ-ਪ੍ਰਦ

ਪੰਜਾਬ ਨਾਲਾ

ਮੈਵਰਲ-ਪ੍ਰਦ

ਧੀਰੀ ਦੱਖਣ (ਸਾਰਾਤ ਅਤੇ ਚਲਾਏ)

ਅਧਾਰ ਅਤੇ ਧੀਰੀ

ਅਧਾਰ-ਪ੍ਰਦ ਅਤੇ ਧੀਰੀ-ਪ੍ਰਦ ਸਟੈਟਿਕਸ

1. ਪ੍ਰਤਿਵਾਰ ਦੱਖਣ ਦੇ ਬਰ ਵਰਾਤ ਦੇਖਣ। ਉਤ ਵਰਾਤ ਦੀਆਂ ਦੇ ਪ੍ਰਤਿਵਾਰ ਪੁੱਜਣ ਸਟਾਰਗੜਾ।

2. ਲਿਕਾਲਾਲੀ ਦੇ ਬੁੱਧ ਪ੍ਰਤਿਵਾਰ ਵਰਾਤ ਦੇ ਬਾਅਦ। ਉਤ ਵਰਾਤ ਦੀਆਂ ਦੇ ਪ੍ਰਤਿਵਾਰ ਸਟੇਟਸ ਦੇ ਬਾਅਦ।

3. ਨੋਹ ਪ੍ਰਤਿਵਾਰ ਦੇ ਬਰ ਹੁਮਕੇ ਅਤੇ ਕਲ।

4. ਲੇਖਣ ਮੈਂਟ ਵਰਕਲ ਲਾਗਾ ਦੇਖਣ ਦੇ ਦੇ ਪ੍ਰਤਿਵਾਰ ਦੀ ਦੱਖਣ ਅਤੇ ਦੱਖਣ ਦੇ ਪ੍ਰਤਿਵਾਰ ਦੀਆਂ ਦੇ ਪ੍ਰਤਿਵਾਰ ਨਸ਼ਤਾ ਦੇ ਬਾਲ ਸਟਾਰਗੜਾ।
Bachelor of Computer Applications (Semester – II)

PAPER–VI: Punjab History & Culture (C 320 to 1000 B.C.)
(Special Paper in lieu of Punjabi compulsory)
(For those students who are not domicile of Punjab)

Time: 3 Hours Max. Marks: 50

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section–A
1. Alexander’s Invasion and its Impact
2. Punjab under Chandragupta Maurya and Ashoka.

Section–B
3. The Kushans and their Contribution to the Punjab.
4. The Panjab under the Gupta Empire.

Section–C
5. The Punjab under the Vardhana Emperors
6. Socio-cultural History of Punjab from 7th to 1000 A.D.

Section–D
7. Development of languages and Education with Special reference to Taxila
8. Development of Art & Architecture

Suggested Readings:
1. L. M Joshi (Ed), History and Culture of the Punjab, Art-I, Punjabi University, Patiala, 1989 (3rd Edition)
DRUG ABUSE: MANAGEMENT AND PREVENTION

Time: 3 Hours
Max. Marks: 50

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section – A
Prevention of Drug Abuse:
Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.

Section – B
School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

Section – C
Controlling Drug Abuse:
Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program

Section – D
References:
Bachelor of Computer Applications (Semester – III)

Paper – I: COMPUTER ARCHITECTURE

Time: 3 Hours M. Marks: 75

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section A
Basic Computer Design Instruction Codes, Computer Instructions, Timing Signals, Instruction Cycle, Design of a Basic Computer.

Section B
CPU Design General Register Organization, Stack Organized CPU, Instruction Formats, Addressing Modes, Program Control, Hardwired & Microprogrammed (Wilhe’s Design) Control Unit, RISC and CISC Characteristics.

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

Section D
I/O Organization I/O Interface, Modes of Transfer, Program Interrupt, DMA & I/O Processor.
Pipeline & Vector Processing Introduction to Parallel Processing and Pipelining, SISD, SIMD & MISD, MIMD Machines.

References:
Computer System Architecture: M.M. Mano (PHI)
Computer Architecture: J.P. Hayes.
Computer Architecture: Patterson & Hemessy.
Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section A
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.

Section B
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.

Section C

Section D
Big Data: Introduction to Big Data and Analytics, Introduction to NoSQL

Books and References:
1. Introduction to Database System by C.J. Date.
2. Database Management System by B.C. Desai.
3. Database Concept by Korth.
4. Simplified Approach to DBMS–Kalyani Publishers
7. https://www.mongodb.com/nosql-explained
8. Introduction to NoSQL (Ebook), NoSQL Seminar 2012 @ TUT, Arto Salminen
Bachelor of Computer Applications (Semester – III)

Paper III: Introduction to PYTHON Programming

Time: 3 Hrs.  M. Marks: 75

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section A
Introduction to Python: Python’s Technical Strengths, Execution Model, Process of Computational Problem Solving, Different ways to run Python Programs.
Data and Expressions: Literals, Variables and Identifiers, Operators, Expressions, Strings, Statements and Data Types, Boolean Expressions (Conditions), Logical Operators, Selection Control, Nested conditions, Debugging
Lists & Dictionaries: List Structures, Lists (Sequences) in Python, Iterating Over Lists (Sequences) in Python, Dictionaries and Files, Looping and dictionaries, Advanced text parsing

Section B
Control Structures: Conditional blocks using if, else and elif, While statement, Definite loops using For, Loop Patterns,

Section C
Files: Opening Files, Using Text Files, Reading files, Writing files, Understanding read functions, read(), readline() and readlines(), Understanding write functions, write() and writelines(), Manipulating file pointer using seek, String Processing, Exception Handling
Objects and Their Use: Introduction to Object Oriented Programming, Concept of class, object and instances, Constructor, class attributes and destructors, Real time use of class in live projects, Inheritance, overlapping and overloading operators, Adding and retrieving dynamic attributes of classes, Programming using OOPS support

Section D
Using Databases and SQL: Database Concepts, SQL basic summary, SQL Database connection using python, creating and searching tables, Programming using database connections, Basic Data modelling, Programming with multiple tables
Reference Books:

1. Python for Informatics, Charles Severance, version 0.0.7
Bachelor of Computer Applications (Semester – III)

Paper – IV
(Programming Lab-I)

Lab – I: Based on Python Programming Language : 50 Marks

Paper – V
(Programming Lab-II)

Lab – II: Practical in Oracle : 25 Marks
Bachelor of Computer Applications (Semester – IV)

Paper – I: DATA STRUCTURES AND FILE PROCESSING

Time: 3 Hours M. Marks: 75

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section A
Basic Data Structures: Introduction to elementary Data Organization and operations, complexity of Algorithms and Time space trade off, Arrays, Stacks, Queues, Linked Lists.

Section B

Section C
Searching Techniques: Linear and Binary Search.

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

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.
Bachelor of Computer Applications (Semester – IV)

Paper – II: INFORMATION SYSTEMS

Time: 3 Hours

M. Marks: 75

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

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

Section B

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

Section D
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

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section A
Introduction: About internet and its working, business use of internet, services offered by internet, Evolution of internet, internet service provider (ISP), windows environment for dial up networking (connecting to 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).

Section B
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.

Section C
Search Engine: About search engine, component of search engine, working of search engine, difference between search engine and web directory.

Section D
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:
Bachelor of Computer Applications (Semester – IV)

Paper – IV: SYSTEM SOFTWARE

Time: 3 Hours

M. Marks: 75

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section A

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

Section B

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

Macroprocessors:
Macro definition and expansion, conditional macro expansion, Recursive macro expansion

Section C

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

Section D

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

References:
Bachelor of Computer Applications (Semester – IV)

Paper – V: LAB - I

Time: 3 Hours  M. Marks: 50
Lab – Data Structure implementation using C++

Paper – VI: LAB - II

Time: 3 Hours  M. Marks: 50
Lab – Web Designing and use of Internet
Teaching Methodologies
The Core Module Syllabus for Environmental Studies includes classroom teaching and field work. The syllabus is divided into 8 Units [Unit-1 to Unit-VII] covering 45 lectures + 5 hours for field work [Unit-VIII]. The first 7 Units will cover 45 lectures which are classroom based to enhance knowledge skills and attitude to environment. Unit-VIII comprises of 5 hours field work to be submitted by each candidate to the Teacher in-charge for evaluation latest by 15 December, 2019.

Exam Pattern:
End Semester Examination- 75 marks
Project Report/Field Study- 25 marks [based on submitted report]
Total Marks- 100

The structure of the question paper being:

Part-A, Short answer pattern with inbuilt choice – 25 marks
Attempt any five questions out of seven distributed equally from Unit-1 to Unit-VII. Each question carries 5 marks. Answer to each question should not exceed 2 pages.

Part-B, Essay type with inbuilt choice – 50 marks
Attempt any five questions out of eight distributed equally from Unit-1 to Unit-VII. Each question carries 10 marks. Answer to each question should not exceed 5 pages.

Project Report / Internal Assessment:
Part-C, Field work – 25 marks [Field work equal to 5 lecture hours]
The candidate will submit a handwritten field work report showing photographs, sketches, observations, perspective of any topic related to Environment or Ecosystem. The exhaustive list for project report/area of study are given just for reference:

1. Visit to a local area to document environmental assets: River / Forest/ Grassland / Hill / Mountain / Water body / Pond / Lake / Solid Waste Disposal / Water Treatment Plant / Wastewater Treatment Facility etc.
2. Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
3. Study of common plants, insects, birds
4. Study of tree in your areas with their botanical names and soil types
5. Study of birds and their nesting habits
6. Study of local pond in terms of wastewater inflow and water quality
7. Study of industrial units in your area. Name of industry, type of industry, Size (Large, Medium or small scale)
8. Study of common disease in the village and basic data from community health centre
9. Adopt any five young plants and photograph its growth
10. Analyze the Total dissolved solids of ground water samples in your area.
11. Study of Particulate Matter (PM$_{2.5}$ or PM$_{10}$) data from Sameer website. Download from Play store.
12. Perspective on any field on Environmental Studies with secondary data taken from Central Pollution Control Board, State Pollution Control Board, State Science & Technology Council etc.
Unit-I
The multidisciplinary nature of environmental studies
Definition, scope and importance, Need for public awareness
(2 lectures)

Unit-II
Natural Resources: Renewable and non-renewable resources:
Natural resources and associated problems.
(a) Forest resources: Use and 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, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
(f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.
(8 Lectures)

Unit-III
Ecosystems
- 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 ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)
(6 Lectures)

Unit-IV
Biodiversity and its conservation
- Introduction – 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 a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity
(8 Lectures)
Unit-V

Environmental Pollution:
Definition:
- Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear pollution
- 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

(8 Lectures)

Unit-VI

Social Issues and the Environment
- From unsustainable to sustainable development
- Urban problems and 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, 1986
- Air (Prevention and Control of Pollution) Act, 1981
- Water (Prevention and control of Pollution) Act, 1974
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

(7 Lectures)

Unit-VII

Human Population and the Environment
- Population growth, variation among nations
- Population explosion – Family Welfare Programmes
- 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

(6 Lectures)
Field Work

- 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

*(Field work equal to 5 lecture hours)*

References:

2. Down to Earth, Centre for Science and Environment, New Delhi.
9. State of India’s Environment 2018 by Centre for Sciences and Environment, New Delhi
Bachelor of Computer Applications (Semester – IV)
Bachelor of Computer Applications (Semester – V)

Paper – I: COMPUTER NETWORKS

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. **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.

UNIT – II

3. **Local Area Network Protocols:** CSMA Protocols, BRAP, MLMA, IEEE standards 802, 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.

UNIT – III

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

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

References:

Bachelor of Computer Applications (Semester – V)

Paper II: WEB TECHNOLOGIES

Time: 3 Hrs. M. Marks: 75

Note:
(i) The paper setter is required to set eight questions in all and the candidates will be required to attempt any five questions out of these eight questions. All questions will carry equal marks.
(ii) The student can use only Non-programmable & Non-storage type calculator.

UNIT–I

Web Essentials, Markup languages, CSS
Basics of Client side programming, Java script language, java script objects, host objects, Browsers and DOM

UNIT–II

Basics of Server side programming, Java servlets
ASP/JSP, Basics of ASP/JSP objects, simple ASP and JSP pages

Representing Web data, Data base connectivity, JDBC

UNIT–III

Introduction to PHP, basics, PHP File handling, file upload, cookies, error handling, PHP
MySQL introduction

Middleware technologies, Ecommerce architecture and technologies, Ajax, Advanced web technologies and tools

Case Studies: PHP and MySQL case studies.

References:

Bachelor of Computer Applications (Semester – V)

Paper – III: OPERATING SYSTEM

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

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

Unit – II

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

Unit – III

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:

2. Operating Systems, A Design Oriented Approach” by Crowley, Published by Tata McGraw Hill.
Bachelor of Computer Applications (Semester – V)

Paper – IV: JAVA PROGRAMMING LANGUAGE

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

UNIT-II
Classes & Methods, constructors, Inheritance & Polymorphism. Packages & Interfaces, Multithreading in Java.

UNIT-III
Exception Handling, String handling in Java & Input/Output in Java.

References:
Bachelor of Computer Applications (Semester – V)

Paper–V

Time: 3 Hours

Marks: 50

Lab : Lab based on JAVA Programming Language

Paper–VI

Time: 3 Hours

Marks: 50

Lab : Lab based on ASP.NET
Bachelor of Computer Applications (Semester – VI)

Paper – I: COMPUTER GRAPHICS

Time: 3 Hours

Total Marks: 75

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.

UNIT – I

1. **Overview of Graphics system:** Computer Graphics and their applications.

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

3. **Graphics Software.**

UNIT – II

4. **Elementary Drawing:** Points and various line drawing Algorithms and their comparisons. Circle generating algorithms, Algorithms for ellipse, arc and spiral.

5. **Two Dimensional Transformations:** Basic Transformations, Scaling, Translation, Rotation, Reflection, Shear, Matrix representation of Basic transformations and homogenous coordinates.

UNIT – III


References:

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. **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.

UNIT – II
4. **Software Requirement Specification (SRS)**: Problem analysis, structuring information, Data flow diagram and data dictionary, structured analysis, Characteristics and component of (SRS).

UNIT – III
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.
Paper – III: Programming Laboratory

Time: 3 Hours
Lab: Implementation of Applications of Computer Graphics in C++/C  Marks: 50
General Instructions:

1. A software module based on the work done in the entire course is to be developed.
2. The soft copy of the module shall be submitted to the College/Institute till April 30 of the respective semester.
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.