### B.Sc. (Computer Science) – First Year

<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Title of Paper</th>
<th>External Marks</th>
<th>Internal Assessment</th>
<th>Maximum Marks</th>
<th>Pass Marks</th>
<th>Exam Durations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Computer Fundamentals &amp; Programming in ‘C’</td>
<td>40</td>
<td>5</td>
<td>45</td>
<td>16</td>
<td>3hrs</td>
</tr>
<tr>
<td>II</td>
<td>Logical Organization of Computer-I</td>
<td>40</td>
<td>5</td>
<td>45</td>
<td>16</td>
<td>3hrs</td>
</tr>
<tr>
<td>III</td>
<td>Practical (Programming in ‘C’)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester II</td>
<td></td>
<td>60</td>
<td>24</td>
<td>3hrs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### B.Sc. (Computer Science) - Second Year

<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Title of Paper</th>
<th>External Marks</th>
<th>Internal Assessment</th>
<th>Maximum Marks</th>
<th>Pass Marks</th>
<th>Exam Durations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester III</td>
<td></td>
<td>40</td>
<td>5</td>
<td>45</td>
<td>16</td>
<td>3hrs</td>
</tr>
<tr>
<td>I</td>
<td>Data Structures using ‘C’</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Structured System Analysis &amp; Design</td>
<td>40</td>
<td>5</td>
<td>45</td>
<td>16</td>
<td>3hrs</td>
</tr>
<tr>
<td>III</td>
<td>Practical (Implementation of data structure in ‘C’)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester IV</td>
<td></td>
<td>60</td>
<td>24</td>
<td>3hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Operating Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Programming in Visual Basic</td>
<td>40</td>
<td>5</td>
<td>45</td>
<td>16</td>
<td>3hrs</td>
</tr>
<tr>
<td>VI</td>
<td>Practical (Visual Basic)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### B.Sc. (Computer Science) - Third Year

<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Title of Paper</th>
<th>External Marks</th>
<th>Internal Assessment</th>
<th>Maximum Marks</th>
<th>Pass Marks</th>
<th>Exam Durations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester V</td>
<td></td>
<td>40</td>
<td>5</td>
<td>45</td>
<td>16</td>
<td>3hrs</td>
</tr>
<tr>
<td>I</td>
<td>Programming in ‘C++’</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Introduction to Data Base Systems</td>
<td>40</td>
<td>5</td>
<td>45</td>
<td>16</td>
<td>3hrs</td>
</tr>
<tr>
<td>III</td>
<td>Practical (‘C++’)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Semester VI
<table>
<thead>
<tr>
<th></th>
<th>Course Title</th>
<th>Credits</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Theory</th>
<th>Labs</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>Computer Networks</td>
<td>40</td>
<td>5</td>
<td>45</td>
<td>16</td>
<td></td>
<td>3hrs</td>
</tr>
<tr>
<td>V</td>
<td>Relational Database Management System</td>
<td>40</td>
<td>5</td>
<td>45</td>
<td>16</td>
<td></td>
<td>3hrs</td>
</tr>
<tr>
<td>VI</td>
<td>Practical (ORACLE)</td>
<td>60</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td>3hrs</td>
</tr>
</tbody>
</table>
PAPER I  PROGRAMMING in ‘C++’

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of six (objective type/short-answer type) questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Maximum Marks: 45   External: 40
Minimum Pass Marks: 16   Internal: 5
Time: 3 hours

UNIT – I
Introduction to Programming C++: Object-Oriented Features of C++, Class and Objects, Data Hiding & Encapsulation, Structures, Data members and Member functions, Inline Functions, Static Data Members and Member Functions, Friend Functions, Preprocessor Directives, Namespace, Comparing C with C++.

UNIT – II
Constructors & Destructors: Roles and types of Constructors, Roles of Destructors, Dynamic Memory Allocation: Pointers and their Manipulation, new and delete Operators ‘this’ Pointer.
Console I/O: Formatted and Unformatted I/O, Manipulators.

UNIT – III
Compile-Time Polymorphism: Unary and Binary Operators overloading through Member Functions and Friend Functions, Function Overloading.
Inheritance: Types of Derivations, Forms of Inheritance, Roles of Constructors and Destructors in Inheritance.

UNIT – IV
Genericity in C++: Template Function, Template Class, Inheritance and Templates.
Exception Handling: try, throw and catch constructs, rethrowing an exception, catch all Handlers.

TEXT BOOKS:
2. Robert Lafore, Object Oriented Programming in C++, PHI

REFERENCE BOOKS:
PAPER – II INTRODUCTION TO DATABASE SYSTEMS

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of six (objective type/short-answer type) questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Maximum Marks: 45
Minimum Pass Marks: 16
Time: 3 hours

UNIT – I
Roles in the Database Environment - Data and Database Administrator, Database Designers, Applications Developers and Users.

UNIT – II
Database System Architecture – Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances.
Data Independence – Logical and Physical Data Independence.
Classification of Database Management System, Centralized and Client Server architecture to DBMS.

UNIT – III
Entity-Relationship Model – Entity Types, Entity Sets, Attributes Relationship Types, Relationship Instances and ER Diagrams.
Basic Concepts of Hierarchical and Network Data Model.

UNIT – IV
Relational Data Model:-Brief History, Relational Model Terminology-Relational Data Structure, Database Relations, Properties of Relations, Keys, Domains, Integrity Constraints over Relations, Base Tables and Views.

TEXT BOOKS:

REFERENCE BOOKS:
PAPER IV  COMPUTER NETWORKS

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of six (objective type/short-answer type) questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Maximum Marks: 45
Minimum Pass Marks: 16
Time: 3 hours

UNIT – I
Introduction to Computer Communications and Networking Technologies; Uses of Computer Networks; Network Devices, Nodes, and Hosts; Types of Computer Networks and their Topologies; Network Software: Network Design issues and Protocols; Connection-Oriented and Connectionless Services; Network Applications and Application Protocols; Computer Communications and Networking Models: Decentralized and Centralized Systems, Distributed Systems, Client/Server Model, Peer-to-Peer Model, Web-Based Model, Network Architecture and the OSI Reference Model; Example Networks: The Internet, X.25, Frame Relay, ATM;

UNIT – II
Analog and Digital Communications Concepts: Representing Data as Analog Signals, Representing Data as Digital Signals, Data Rate and Bandwidth, Capacity, Baud Rate; Digital Carrier Systems; Guided and Wireless Transmission Media; Communication Satellites; Switching and Multiplexing; Dialup Networking; Analog Modem Concepts; DSL Service;

UNIT – III
Data Link Layer: Framing, Flow Control, Error Control; Error Detection and Correction; Sliding Window Protocols; Media Access Control: Random Access Protocols, Token Passing Protocols; Token Ring; Introduction to LAN technologies: Ethernet, switched Ethernet, VLAN, fast Ethernet, gigabit Ethernet, token ring, FDDI, Wireless LANs; Bluetooth; Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways;

UNIT – IV
Network Layer and Routing Concepts: Virtual Circuits and Datagrams; Routing Algorithms; Congestion Control Algorithms; Internetworking; Network Security Issues: Security threats; Encryption Methods; Authentication; Symmetric – Key Algorithms; Public-Key Algorithms;

TEXT BOOKS:

REFERENCE BOOKS:
PAPER – V RELATIONAL DATABASE MANAGEMENT SYSTEM

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of six (objective type/short-answer type) questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Maximum Marks: 45
Minimum Pass Marks: 16
Time: 3 hours

UNIT – I
Relational Model Concepts, Codd's Rules for Relational Model,
Relational Algebra:-Selection and Projection, Set Operation, Renaming, Join and Division.
Relational Calculus: Tuple Relational Calculus and Domain Relational Calculus.

UNIT – II
Functional Dependencies and Normalization:-Purpose, Data Redundancy and Update Anomalies.
Decomposition and Normal Forms (1NF, 2NF, 3NF & BCNF).

UNIT – III
SQL: Data Definition and data types, Specifying Constraints in SQL, Schema, Change statement, Basic Queries in SQL, Insert, Delete and Update Statements, Views.

UNIT – IV
PL/SQL-Introduction, Advantages of PL/SQL,
The Generic PL/SQL Block: PL/SQL Execution Environment,
PL/SQL Character set and Data Types,
Control Structure in PL/SQL.

TEXT BOOKS:

REFERENCE BOOKS: