### Scheme of BCA

**Semester – V**

<table>
<thead>
<tr>
<th>Code</th>
<th>Theory Paper</th>
<th>External</th>
<th>Internal</th>
<th>Practical</th>
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<tr>
<td>SOSBCA 501</td>
<td>Differential Equations</td>
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<td>20</td>
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<tr>
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<td>Networking Concepts</td>
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<td>SOSBCA 505</td>
<td>Oracle 8i</td>
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<td>20</td>
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UNIT–I
Differential Equations of First Order and First Degree:
Homogeneous Differential Equations, Reducible to Homogeneous Differential Equations, Linear
Differential Equations, Reducible to Linear Differential Equations, Bernoulli’s Equation, Exact
Differential Equations, Change of Variables.

Differential Equations of First Order and Higher Degree:
Differential Equations solvable for p, solvable for y, solvable for x, Clairaut’s Equation.

UNIT–II
Family Of Curves:
Linear Differential Equations of Higher order with constant coefficients, Differential Equations
reducible to Linear Differential Equations with Constant Coefficients, Simultaneaus differential
equation of first order..

UNIT–III
Partial Differential Equations:
Definition and Formation. Partial Differential equation of first order, Lagrange’s method, standard
forms, Charpit’s Method, Linear Partial Differential Equation of Higher order with Constant
Coefficients.

UNIT–IV
Linear Differential Equations of second order, Application of Partial differential equation : Method of
separation of variables , Solution of One dimensional wave equation and one dimensional heat
equation.

UNIT–V
Series Solution of Differential Equations:
Power series method, Bessel and Legendre functions and their properties, Recurrence relations for
Besseles function & Legendre function .

Recommended Books:
1. Partial differential equation by Snadden
2. Ordinary and Partial Differential Equations by M.D.Raisinghania
Jiwaji University, Gwalior – BCA – Session 2013-16

PAPER CODE SOSBCA – 502
Networking Concepts


UNIT 4 - ISDN; ATM; Data Link Layer: Services, Framing, Error Control, Error-Detecting & Correcting Codes. Data Link Protocols: Stop-and-Wait Protocol, Sliding Window Protocol. HDLC; Static & Dynamic Channel Allocation in LANs & MANs.


Reference:
1. Computer Networks By Tanenbaum
2. Data&Computer Communications By Stallins.
UNIT 1: Introduction
Brief history of e-com, Elements of e-com, Types, Intermediaries and E-Commerce, Advantages & Disadvantages of e-com, E-Commerce practices Vs traditional business practices.

UNIT 2: E-BUSINESS; E-BUSINESS VS E-COMMERCE, EDI- WHO USE EDI, ORIGIN, BENEFITS, MIGRATION TO OPEN EDI-APPROACH, E-COM WITH WWW/INTERNET.

UNIT 3: Electronic communication & WWW
PC and networking, Network topologies and communication media, E-mail, OSI and TCP/IP Models, LAN, WAN, MAN, Internetworking – Bridges and gateways, What is Web (World Wide Web), Web Architecture, The Web and E-Com.

UNIT 4: Electronic Payment System:
Electronic payment system – Overview, Electronic or digital cash, Electronic Checks-Benefits, Online credit card based system, Debit card, Smart Cards.

UNIT 5: Security and Application

REFERENCE BOOKS:
2. “Web Commerce Technologies Handbok” By Daniel Minoli & Emma Minoli
3. “E-Commerce” By Dr. Varinder Bhatia
UNIT–I
C++ Vs JAVA, JAVA and Internet and WWW, JAVA support systems, JAVA environment. JAVA program structure, Tokens, Statements, JAVA virtual machine, Constant & Variables, Data Types, Declaration of Variables, Scope of Variables, Symbolic Constants, Type Casting. Operators : Arithmetic, Relational, Logical Assignments, Increment and Decrement, Conditional, Bitwise, Special, Expressions & its evaluation. If statement, if…else… statement, Nesting of if…else… statements, else…if Ladder, Switch, ? operators, Loops – While, Do, For, Jumps in Loops, Labelled Loops.

UNIT–II
DEFINING A CLASS, ADDING VARIABLES AND METHODS, CREATING OBJECTS, ACCESSING CLASS MEMBERS, CONSTRUCTORS, METHODS OVERLOADING, STATIC MEMBERS, NESTING OF METHODS. INHERITANCE: EXTENDING A CLASS, OVERRIDING METHODS, FINAL VARIABLES AND METHODS, FINAL CLASSES, FINALIZE METHODS, ABSTRACT METHODS AND CLASSES, VISIBILITY CONTROL.

UNIT–III
ARRAYS: ONE DIMENSIONAL & TWO DIMENSIONAL, STRINGS, VECTORS, WRAPPER CLASSES, DEFINING INTERFACE EXTENDING INTERFACE, IMPLEMENTING INTERFACE, ACCESSING INTERFACE VARIABLE, SYSTEM PACKAGES, USING SYSTEM PACKAGE, ADDING A CLASS TO A PACKAGES, HIDING CLASSES.

UNIT–IV
CREATING THREADS, EXTENDING THE THREADS CLASS, STOPPING AND BLOCKING A THREAD, LIFE CYCLE OF A THREAD, USING THREAD METHODS, THREAD EXCEPTIONS, THREAD PRIORITY, SYNCHRONIZATION, IMPLEMENTING THE RUNNABLE INTERFACE.

UNIT–V
LOCAL AND REMOTE APPLETS VS APPLICATIONS, WRITING APPLETS, APPLETS LIFE CYCLE, CREATING AN EXECUTABLE APPLET, DESIGNING A WEB PAGE, APPLET TAG, ADDING APPLET TO HTML FILE, RUNNING THE APPLET, PASSING PARAMETERS TO APPLETS, ALIGNING THE DISPLAY, HTML TAGS & APPLETS, GETTING INPUT FROM THE USER.

TEXT & REFERENCE BOOKS:
JAVA COMPLETE REFERENCE – TMH PUBLICATIONS
JAVA VOLUME I & II – PEARSON EDUCATION
PROGRAMMING IN JAVA, 2ND EDITION, E. BALAGURUSWAMY, TMH PUBLICATIONS
PETER NORTON GUIDE TO JAVA PROGRAMMING, PETER NORTON, TECHMEDIA PUBLICATIONS
PAPER CODE SOSBCA - 505
ORACLE 8i

UNIT - I DIFFERENT DATA BASE MODEL, RDBMS COMPONENTS — KERNEL, DATA DICTIONARY, CLIENT/SERVER COMPUTING AND ORACLE, OVERVIEW OF ORACLE ARCHITECTURE — ORACLE FILES, SYSTEM AND USER PROCESS, ORACLE MEMORY, ROLE OF DBA, SYSTEM DATA BASE OBJECT, PROTECTING DATA

UNIT - II SQL Plus, Oracle data types, Creation, Insertion, Updation, Deletion of tables, Modification of structure of tables, Removing, Deleting, Dropping of Tables, Data Constraints, Column level & table Level Constraints. Null, Unique Key, Default key, Foreign key, Check Integrity constraints. Defining different constraints on the table Defining Integrity Constraints in the ALTER TABLE Command, Select Command, Logical Operator, Range Searching, Pattern Matching, Oracle Function, Grouping data from Tables in SQL, Manipulation Data in SQL

UNIT-III Joining Multiple Tables (Equi Joins), Joining a Table to itself (self Joins), Subqueries Union, intersect & Minus Clause, Creating view, Renaming the Column of a view, Granting Permissions, - Updation, Selection, Destroying view, Permission on the objects created by the user, GRANT statement, Object Privileges, Referencing a table belonging to another user, Revoking the permission given, Indexes

UNIT-IV PL/SQL, SQL & PL/SQL DIFFERENCES, BLOCK STRUCTURE, VARIABLES, CONSTANTS, DATATYPE, ASSIGNING DATABASE VALUES TO VARIABLES, SELECT … INTO, CURSORS, USING FLOW CONTROL AND LOOP STATEMENT, GOTO STATEMENT, ERROR HANDLING, BUILT-IN EXCEPTIONS, USER DEFINED EXCEPTIONS, THE RAISE-APPLICATION-ERROR PROCEDURE, ORACLE TRANSACTION, LOCKS, IMPLICIT AND EXPLICIT LOCKING.

UNIT-V Procedures & Functions - Concept, creation, execution, advantages, syntax, deletion, Triggers - Concept, use, how to apply database triggers, type of triggers, syntax, deleting, Import, Export, Oracle backup and recovery

Recommended Books:
1. Ivan Bayross, “SQL, PL/SQL”, BPB Publications
2. Liebschuty, “The Oracle Cook Book”, BPB Publication
4. Oracle Unleashed (Chapter 1, 2, 3, 4, 5 and 9)