TEACHING AND EXAMINATION SCHEME FOR

Vocational Computer Applications II Year

WEF 2021 – 22

Paper Name (Theory)	**Lec.**	**Exam Hours**	**Marks of B. Sc.**	
VCA-03 Discrete Mathematics	3	3	75	27
VCA-04 Java Programming	3	3	75	27
Paper Name (Practicals)				
VCA-LAB-02Java Programming	3	3	75	27

Note:

The question paper for Vocational Computer Applications (B. Sc.) will be divided into 3 parts

Part A:

1. 10 Question of 1 mark each – 10 marks
2. Answer should not exceed more than 20 words
3. All questions are compulsory

Part B:

1. 5 Questions of 4 marks each – 20 marks
2. Answer should not exceed more than 50 words
3. All questions are compulsory

Part C:

1. 3 Questions of 15 marks each – 45 marks. There will be an internal choice in each question.
2. Answer should not exceed 400 words
3. All questions are compulsory.

Practical exam to be conducted by one internal and one external examiner.
Duration of Practical exam is 3 hours.

Duration: 3 hours *Max marks: B. Sc. – 75*

VCA-03 Discrete Mathematics

Sets: definition and types, set operations, partition of set, cardinality, recursive definition of set. Functions: concept, some special functions (polynomial, exponential & Logarithmic, absolute value, floor & ceiling, mod & div functions) properties of functions, cardinality of infinite set, countable and uncountable set, pigeon hole principle, composition of function

Relations: Boolean matrices, binary relation, adjacency matrix of relation, properties of relations, operations of relations, connectivity relation, transitive closure

Graph theory: Graphs, directed, undirected, simple, adjacency & incidence, degree of vertex, sub-graph, complete graph, cycle & wheel graph, bipartite & complete bipartite graph, weighed graph

Duration: 3 hours *Max marks: B. Sc. – 75*

VCA-04 Java Programming

Introducing Data Types and Operators

Java's Primitive Types, Literals, Variables, operators, Type conversion in Assignments, Cast, Operator Precedence, Expressions.

Program Control Statements

Input characters from the Keyword, if statement, Nested ifs, if-else-if Ladder, Switch Statement, Nested
switch statements, for Loop, Enhanced for Loop, While Loop, do-while Loop, Use break, Use continue, Nested Loops**.**

Introduction to Classes, Objects and Methods

Class Fundamentals, Reference Variables and Assignment, Methods, Using Parameters, Constructors, Parameterized Constructors, The new operator.

More Data Types and Operators

Arrays, Multidimensional Arrays, Alternative Array Declaration Syntax, Assigning Array References, Using
the Length Member, The Bitwise operators.

String Handling

String Fundamentals, The String Constructors, Three String-Related Language Features, The Length()
Method, Obtaining the characters within a string, String comparison, using indexOf() and last IndexOf(),
Changing the case of characters within a string, String Buffer and String Builder.

Method Overloading, Overloading Constructors, Recursion

Inheritance

Inheritance Basics, Member Access and Inheritance, Constructors and Inheritance, Using super to Call
Super class constructors, Using super to Access Super class Members, Creating a Multilevel Hierarchy,

Interfaces

Interface Fundamentals, Creating an Interface, Implementing an Interface, Using Interface References,
Implementing Multiple Interfaces, Interfaces can be extended

Packages

Package Fundamentals, Packages and Member Access, Importing Packages, Static Import

Exception Handling

The Exception Hierarchy, Exception Handling Fundamentals, using Multiple catch clauses, Catching
subclass Exceptions, try blocks can be nested, Throwing an Exception

Multithreaded Programming

Multithreading fundamentals, The Thread Class and Runnable Interface, Creating Thread, CreatingMultiple Threads, Determining When a Thread Ends, Thread Priorities, Synchronization, Thread Communication using notify(), wait() and notifyAll(), suspending, Resuming and stopping Threads.