

Computer Applications Syllabus

There is one written paper of two hours duration carrying 100 marks and Internal Assessment of 100 marks. The paper is divided into two sections: A and B. Section A (Compulsory - 40 marks) consists of compulsory short answer questions covering the entire syllabus. Section B (60 marks) consists of questions which require detailed answers and there is a choice of questions in this section.

1. Operating System

i) Introduction to Operating System

The need for an operating system, features and functions of an operating system and familiarity with installing and uninstalling software.

Functions and features of an operating system (examples of single user and multiple users); familiarize the students with installation and un-installation of connected peripherals and other related softwares like dictionaries, encyclopedias, etc.

ii) Graphic User Interface

Working with the Graphical User Interface (GUI), Elements of a GUI, handling files and directories under GUI, managing the desktop.

Concept of an active window. Familiarity with the icons, the buttons and the task bar. Resizing a window. Handling multiple windows. Creating folders. Copying items. Moving items. Deleting Items. Setting attributes of items. Creating shortcuts on the desktop, arranging the folders on the desktop.

2. The Internet

Internet, e-mail, WWW, modem and related protocols.

Working of internet, creating an e-mail account, sending and receiving e-mails, web servers, search engines to perform a simple search and Boolean operators to fine tune a search, basic working of a modem (modulation and demodulation) through block diagrams only. Protocols and its need (FTP, HTTP, IMAP, POP, SMTP). Downloading information.

3. Computing and Ethics

Ethical issues in computing.

Intellectual property rights; protection of individual's right to privacy; data protection on the internet; protection against Spam; software piracy, cyber crime, hacking, protection against malicious intent and malicious code.

The stress should be on good etiquette and ethical practices.

4. Office Application Software

Word processor, Multimedia presentation and Spreadsheets.

Discuss the following features for Word Processor, Multimedia Presentation and Spreadsheets: Opening and closing, saving, editing, formatting, printing, spell check, grammar and header/footer.

Special features:

Word Processor – inserting a table and working with tables.

Multimedia Presentation – the students should be able to create a presentation using images / pictures, sound, video and custom animation. Students should be able to import material from word processors, spreadsheets, databases and internet.

Spreadsheets – Using formulae functions (mathematical), working with ranges, graphs and charts. Difference between absolute and relative references.

5. Database Packages

The need for database management; creating and saving a database; editing a database; performing calculations; modifying the structure of a database; sorting, indexing; querying; report generation. Working with multiple databases, object linking and embedding, creating applications.

The need for database management for handling vast amount of data - storing, sorting, summarizing, classifying and retrieving quickly.

Defining the structure of a database, entering data of various types, saving it in an appropriate area. Adding, deleting and modifying records, global editing.

Performing calculations on one record or a group of records. Modifying the structure of a database by inserting, deleting or modifying fields. Sorting on one field/ multiple fields, sorting selected records/ all the records.

Indexing on one field/ multiple fields. The need for re- indexing. Sorting vs. Indexing. Setting query condition, Relational and Logical Operators, setting query using multiple conditions. Generating detailed or summary reports.

Working with multiple databases and explain the relationship (one to one, one to many, many to one and many to many) through real life examples.

Linking objects/embedding objects, linking vs. embedding. Creating database applications depending upon the requirement of the user.

6. Elementary Concept of Objects and Classes

Modelling entities and their behaviour by objects; a class as a specification for objects and as an object factory; computation as message passing/function calls between objects (many examples should be done to illustrate this). Objects encapsulate state (attributes) and have behaviour (functions). Class as a user defined type.

A class may be regarded as a blueprint to create objects. It may be viewed as a factory that produces similar objects. A class may also be considered as a new data type created by the user, that has its own functionality.

All the four features of Object Oriented Programming should be defined and explained using real life examples.

Analyze each object and show how each contains attributes and responds to certain messages or permits certain operations.

Emphasize that an object is an instance of a class. A single object is just a bundle of values, one for each attribute in the class.

7. Values and types

Tokens and its types, Primitive types, operations on primitive values, expressions, assignment (assignment is also an expression).

Introduce the primitive types and the range of values each represents. Discuss all the operations that can be done with primitive types namely mathematical, relational and logical. Discuss precedence and associativity of operators.

Introduce the concept of type casting. Introduce `System.out.println` and `System.out.print`, for simple output.

Discuss different types of errors occurring during execution and compilation of the program (syntax errors, runtime errors and logical errors).

8. Conditionals and non-nested loops

Application of if else, if else if ladder, switch-case (default, break).

Fixed number of iterations- the for loop. Unknown number of iterations - while loop, do-while loop.

The conditional/ternary operator (`? :`) should be introduced at this point.

Loops are fundamental to computation and their need should be shown by examples.

Examples: various number based problems: prime numbers, composite numbers, perfect numbers, fibonacci numbers, etc.