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| **PGDCA** |
|  | PGDCA I Sem | **Computer****Fundamentals** | CO 1 | Recall and list the different generations of computers, as well as the various types of computers (Micro, Mini, Mainframe, Supercomputers), and describe their basic characteristics.. |
|  |  |  | CO2 | Explain the architecture of a computer system, including the block diagram, instruction sets, registers, processor speeds, and memory types (RAM, ROM, Cache, etc.). |
|  |  |  | CO3 | Demonstrate the use of various I/O devices (e.g., Keyboard, Mouse, Scanner, Printers) in practical scenarios, identifying the appropriate device for specific tasks. |
|  |  |  | CO4 | Compare and contrast different types of computer software, including system software, application software, and utility programs, and explain their need in the functioning of a computer system. |
|  |  |  | CO5 | Analyze the role of programming languages in software development, including the use of Assemblers, Compilers, and Interpreters, and apply this knowledge to understand how a computer executes code. |
|  | PGDCA I Sem | **Operating System** | CO 1 | Identify and define key concepts related to operating systems, including application programs, system programs, and the functions of an operating system. |
|  |  |  | CO2 | Describe the architecture of operating systems, including subsystems (top layer, middle layer, bottom layer) and the bootstrap process. |
|  |  |  | CO3 | Explain the differences between processes and threads, including their contexts, states, and management techniques. |
|  |  |  | CO4 | Apply CPU scheduling algorithms to manage processes effectively in various scenarios. |
|  |  |  | CO5 | Utilize inter-process communication mechanisms to facilitate communication between processes. |
|  | PGDCA I Sem | **Programming in C** | CO 1 | Understand and Apply Basic Programming Concepts. |
|  |  |  | CO2 | Design and Develop Algorithms, for solving computational problems |
|  |  |  | CO3 | Implement Control Structures and Functions, and functions to develop efficient and functional C programs.. |
|  |  |  | CO4 | Work with Arrays, Pointers, Structures, and Unions in C, and understand their memory representations and practical applications. |
|  |  |  | CO5 | Handle Files and Debug Programs, to perform file operations and debug C programs to identify and resolve issues related to program logic and execution. |
|  | PGDCA I Sem | **Office Management****Tools** | CO 1 | Recall and define the history and versions of DOS, and identify internal and external commands like DIR, COPY, XCOPY, CHKDSK, and FORMAT, as well as their functions in managing files and directories.. |
|  |  |  | CO2 | List the main features and benefits of Windows operating system, including components such as the Control Panel, Taskbar, Recycle Bin, and My Computer, and explain how they assist in system management. |
|  |  |  | CO3 | Explain the purpose and functionality of wildcard characters in DOS commands and describe their use in simplifying file operations like searching and organizing files and directories. |
|  |  |  | CO4 | Describe the functionality of MS Office tools such as Menus, Toolbars, Shortcuts, Hotkeys, and Formatting tools in MS Word, Excel, and PowerPoint, and how they help streamline the process of creating and editing documents, spreadsheets, and presentations. |
|  |  |  | CO5 | Apply DOS commands such as COPY, DEL, XCOPY, FORMAT, and external commands like CHKDSK, and use Windows features like Control Panel and Taskbar to configure system settings, manage files, and optimize system performance for efficient use. |
|  | PGDCA I Sem | **E-Commerce** | CO 1 | Define and articulate essential terms and concepts related to e-commerce and enable themself to engage effectively in discussions about e-commerce. |
|  |  |  | CO2 | Explain the benefits of e-commerce for both businesses and consumers. |
|  |  |  | CO3 | Discuss how the Internet and web technologies support various e-commerce activities and explore the role of technologies. |
|  |  |  | CO4 | Analyze different e-business models and evaluate their applications in real-world scenarios.  |
|  |  |  | CO5 | Apply their knowledge by designing and developing a basic e-commerce website, demonstrating proficiency in essential skills. |
|  | PGDCA I Sem | **Data Base Management System** | CO 1 | Ability to design and implement database schema for an application using RDBMS concepts. |
|  |  |  | CO2 | Ability to write SQL queries for tasks of various complexities. |
|  |  |  | CO3 | Ability to write an application program that uses a database system as the backend. |
|  |  |  | CO4 | Understanding of internal working of a DBMS including data storage, indexing, query processing, transaction processing, concurrency control and recovery mechanisms. |
|  |  |  | CO5 | Awareness of non-relational and parallel/distributed data management systems with a focus on scalability. |
|  | PGDCA II Sem | **Programming in C++** | CO 1 | Demonstrate Knowledge of Object-Oriented Programming Principles explain and identify the core concepts of Object-Oriented Programming, including classes, objects, inheritance, polymorphism, encapsulation, and abstraction, and their significance in software development. |
|  |  |  | CO2 | Implement Basic C++ Programs with Proper Syntax and Structure. |
|  |  |  | CO3 | Utilize Functions and Arrays to Solve Problems in C++ to design and implement functions, pass parameters, return values, and use arrays (single and multidimensional) for effective data handling and problem-solving in C++. |
|  |  |  | CO4 | Create and Manipulate Classes and Objects in C++ to define classes and objects in C++, implement constructors and destructors, overload functions and operators, and demonstrate how objects interact within a program as both data types and physical entities. |
|  |  |  | CO5 | Apply Inheritance and Polymorphism to Create Reusable and Flexible C++ Programs |
|  | PGDCA II Sem | **Web Application****Developments** | CO 1 | Demonstrate the ability to create a basic web page using HTML, including the correct use of elements, tags, and attributes to structure content effectively. |
|  |  |  | CO2 | Apply CSS techniques to style web pages by utilizing various CSS properties and selectors, ensuring a visually appealing and user-friendly design. |
|  |  |  | CO3 | Utilize JavaScript to enhance web forms by implementing validation techniques, managing user input, and creating dynamic interactions within the web page. |
|  |  |  | CO4 | Implement client-server technology concepts by setting up a simple web server and configuring it to host a website. |
|  |  |  | CO5 | Analyze and apply different internet protocols in practical scenarios to facilitate data transfer and communication over the internet. |
|  | PGDCA II Sem | **Programming in JAVA** | CO 1 | Apply the fundamental principles of Object-Oriented Programming to design and implement Java classes and objects that model real-world scenarios. |
|  |  |  | CO2 | Demonstrate the ability to declare and use various Java data types, variables, and operators, along with control to create dynamic and functional Java applications. |
|  |  |  | CO3 | Design classes with appropriate methods and constructors in Java. |
|  |  |  | CO4 | Implement exception handling mechanisms to manage errors gracefully in Java applications, ensuring robust program execution. |
|  |  |  | CO5 | Create multithreaded programs in Java effectively. |
|  | PGDCA II Sem | **Data Communication &****Computer Networking** | CO 1 | Explain the fundamental concepts of networking and the roles of protocols and standards in facilitating communication across networks. |
|  |  |  | CO2 | Demonstrate an understanding of the OSI and TCP/IP models and recognizing the significance of each layer's protocols in real-world networking scenarios. |
|  |  |  | CO3 | Analyze digital and analog signals, understanding their characteristics and limitations in data transmission.  |
|  |  |  | CO4 | Identify various types of errors that can occur during data transmission and apply error detection and correction methods.  |
|  |  |  | CO5 | Explain key networking protocols at different layers. |
|  | PGDCA II Sem | **Computer Architecture** | CO 1 | Identify and describe the basic data types used in computer systems. |
|  |  |  | CO2 | Explain the concepts of register transfer language, bus and memory transfers, and the different types of micro-operations.  |
|  |  |  | CO3 | Discuss the role of instruction codes, computer registers, and timing control in basic computer organization.  |
|  |  |  | CO4 | Apply their knowledge to program the basic computer effectively. |
|  |  |  | CO5 | Design a simple control unit using microprogramming techniques.  |
|  | PGDCA II Sem | **Algorithm and Data Structure** | CO 1 | Define the basic stack operations and describe the representation of stacks using static and dynamic arrays. |
|  |  |  | CO2 | Explain the advantages and disadvantages of different queue implementations and summarize the applications of queues in real-world scenarios. |
|  |  |  | CO3 | Demonstrate the implementation of a single linked list in memory and perform various operations on it. |
|  |  |  | CO4 | Apply different sorting algorithms to a given dataset and compare their performance in terms of time complexity and efficiency. |
|  |  |  | CO5 | Define the basic stack operations and describe the representation of stacks using static and dynamic arrays. |