VIGNAN'S
FOUNDATION FOR SCIENCE, TECHNOLOGY & RESEARCH
(Deemed to be University) - Estd. u/s 3 of UGC Act 1956

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MODULE BANK -2

1. Question-1
    a. Examine the key components of the Aneka framework and analyze how they work together to enable effective cloud application development and resource management.
    b. Compare and Contrast embarrassingly parallel applications and workflow applications within HTC.
    c. Devise a strategy for implementing cloud computing platforms to support real-time remote ECG monitoring and anomaly detection, using cloud services such as Amazon S3 and EC2.

2. Question-2
    a. Analyze how the Aneka container manages various services, including fabric, foundation, and application services, within a cloud infrastructure.
    b. Demonstrate how a parameter sweep application can be developed and executed using Aneka's task programming model.
    c. Formulate an approach for applying cloud computing technologies to enhance gene expression data analysis, with the goal of improving the classification of tumours in cancer diagnosis.

3. Question-3
    a. Demonstrate how to build a simple cloud application using the Aneka SDK, utilizing its APIs for cloud management.
    b. Compare the task programming model in Aneka with other HTC frameworks, focusing on task scheduling and execution efficiency.
    c. Construct a cloud-based infrastructure for supporting social networking applications, focusing on scalability and enhanced user experiences.

4. Question-4
    a. Differentiate between the private, public, and hybrid cloud deployment modes supported by Aneka, highlighting their use cases.
    b. Assess the advantages of using HTC in cloud computing environments for large-scale scientific applications.
    c. Critique the performance-energy efficiency balance in cloud data centers and propose strategies to optimize resource management while reducing environmental impact and operational costs.

5. Question-5
    a. Critically assess the advantages and limitations of using Aneka for cloud application development compared to other cloud platforms.
    b. Propose a workflow for managing tasks with dependencies in an HTC application using Aneka's tools and APIs.
    c. Analyze how cloud-based platforms like Jeeva, using Aneka and machine learning techniques, enhance the protein structure prediction process by utilizing parallel execution to reduce computational time.

6. Question-6
    a. Demonstrate the implementation of a cloud application using Aneka's task-based programming model and outline how it is executed in a hybrid cloud deployment mode.
    b. Illustrate how Aneka supports the development of embarrassingly parallel applications and describe a real-world scenario where this would be useful.
    c. Examine the architecture of Salesforce.com's and Force.com platform to determine its role in supporting CRM application development and customization, and its implications for scalability and user experience.

7. Question-7
    a. Break down the structure of the Platform Abstraction Layer (PAL) in Aneka, and differentiate its key components that facilitate portability across multiple operating systems.
    b. Evaluate the effectiveness of using Aneka for managing a parameter sweep application with thousands of independent tasks.
    c. Investigate the role of web desktops within cloud computing environments and outline the specific advantages they provide in terms of application access and enhancing user experience.

8. Question-8
    a. Illustrate how Aneka's management tools can be used to monitor and manage a large-scale cloud environment.
    b. Dissect the performance of MPI (Message Passing Interface) in cloud computing environments and compare it with other HTC models regarding their use of computational resources.
    c. Explore the ways in which Dropbox and iCloud utilize cloud technologies to mitigate challenges in file storage and synchronization and identify the key issues they resolve for both individual users and organizations.

9. Question-9
    a. Justify the use of the Aneka framework in a scenario where scalability and resource optimization are critical for application success.
    b. Design a comprehensive task-based application that utilizes Aneka's task programming model to solve a large-scale data processing problem.
    c. Examine the mechanisms through which the global market-oriented cloud computing (MOCC) model fosters collaboration between service consumers, providers, and intermediaries, highlighting the key elements and dynamics that drive optimized resource allocation and service delivery.

10. Question-10
    a. Develop a strategy for deploying a distributed application in a private cloud environment using the Aneka platform, addressing scalability and fault tolerance.
    b. Analyze the key characteristics of task-based computing in High-Throughput Computing (HTC) and how they contribute to optimizing computational efficiency.
    c. Analyze the ways in which the Cloudbus Toolkit tackles the challenges associated with implementing market-oriented cloud computing strategies and discuss the practical applications and insights it offers for optimizing cloud resource management and enhancing service delivery.