H Roll No. 2192069

TBC–505(2)

B. C. A. (FIFTH SEMESTER)
END SEMESTER
EXAMINATION, Dec., 2023

FUNDAMENTALS OF CLOUD COMPUTING

Time : Three Hours

Maximum Marks : 100

Note : (i) All questions are compulsory.

(ii) Answer any *two* sub-questions among (a), (b) and (c) in each main question.

(iii) Total marks in each main question are **twenty**.

(iv) Each sub-question carries 10 marks.

1. (a) Elaborate on the advantages of adopting cloud computing for business, emphasizing its potential to drive innovation, cost efficiency, and scalability. (CO1)

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(b) Explain each fundamental characteristic of cloud computing in detail illustrating how they contribute to the overall agility and flexibility of cloud based services. (CO1)

(c) Analyze the role of cloud computing in enabling emerging technologies such as IoT, AI, and big data analytic, and discuss the potential implications for future advancements in these domains. (CO1)

2. (a) Explore the NIST cloud reference architecture in detail, highlighting its key components and how it provides a standardized framework for cloud computing. (CO2)

(b) Define Infrastructure as a Service (IaaS, Platform as a Service (PaaS), and Software as a Service (SaaS), providing clear distinction between each service model. Discuss their respective benefits and use cases in various business scenarios. (CO2)

(c) Conduct a comprehensive comparative analysis of public, private, hybrid, and community cloud development models. Evaluate their respective strengths and weaknesses in items of security, scalability, cost, and performance. (CO2)

3. (a) Define Direct-Attached Storage (DAS), Redundant Array of Independent Disks (RAID), Network-Attached Storage (NAS), and Storage Area Network (SAN) architectures, discussing their unique features and application in enterprise-level storage solutions. (CO3)

(b) Explore the Google File System (GFS) in detail, emphasizing its design, principles, architecture and key components. (CO3)

(c) Explain the role of data centers in supporting cloud computing services, emphasizing their significance in providing scalable and reliable storage solution for diverse workload and application. (CO3)

4. (a) Define the concept of a hypervisor (Virtual Machine Monitor), explaining its role in managing and facilitating the creation of virtual machines on physical hardware. (CO4)

   (b) Explain the concept of hardware virtualization, emphasizing its role in abstracting physical hardware resources to create multiple virtual environments. (CO4)

   (c) Explain the architecture of virtualization systems, highlighting the interactions among the hypervisor, virtual machines and the underlying hardware infrastructure. (CO4)

5. (a) Discuss the key features and benefits of Google App Engine, such as automatic scaling, integrated security and support for multiple programming languages, emphasizing its role in simplifying application development and deployment in the cloud. (CO5)

(b) Discuss the key feature and benefits of AWS including scalability, flexibility, and cost-effectiveness, and its role in enabling business to deploy and manage applications in the cloud. (CO5)

(c) Explain identity and access management policies, to secure cloud resources and data. (CO5)

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