Dr. A.P.J. Abdul Kalam Technical University (AKTU) · B.Tech Theory Examination

Cloud Computing

KCS713 · Jan 2025

Time: 3 Hours **Max. Marks: 100**

Attempt all Sections.
In case of any missing data; choose suitably.

SECTION A

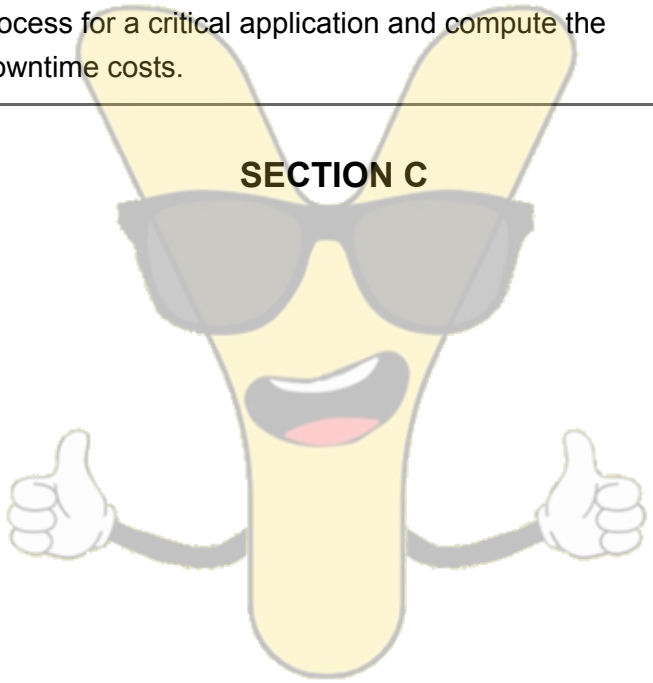
1(a)	Define cloud computing and trace its evolution.	2	U1
1(b)	Critically evaluate the challenges faced during the evolution of cloud computing.	2	U1
1(c)	Explain virtualization.	2	U2
1(d)	Compare implementation levels of virtualization.	2	U2
1(e)	Describe the features and benefits of IaaS, PaaS, and SaaS.	2	U3
1(f)	Explain Storage-as-a-Service.	2	U3
1(g)	Discuss Identity and Access Management (IAM) in cloud environments.	2	U4
1(h)	Discuss encryption techniques for securing cloud resources.	2	U4
1(i)	Describe cloud federation.	2	U5
1(j)	Evaluate the role of federated services and applications.	2	U5

SECTION B

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2(a)	Analyze the underlying principles of parallel computing in cloud environments. Derive equations for workload balancing in a distributed cloud environment handling 10,000 tasks.	10	U1
2(b)	Discuss Service-Oriented Architecture and its relevance in cloud computing. Analyze its impact on application scalability.	10	U2
2(c)	Discuss architectural design challenges in cloud environments. Analyze the trade-offs between performance and security with numerical examples.	10	U3
2(d)	Discuss inter-cloud resource management strategies. Simulate a scenario where multiple clouds collaborate to share resources during a high-demand period.	10	U4
2(e)	Analyze the role of cloud technologies in disaster recovery. Simulate a recovery process for a critical application and compute the associated downtime costs.	10	U5

SECTION C



3(a)	Compare traditional IT resource provisioning with cloud-based provisioning. Provide a cost analysis model for a small business migrating to the cloud.	10	U1
3(b)	Evaluate the importance of elasticity in cloud computing. Provide a numerical model illustrating elasticity when user traffic scales from 10,000 to 1 million users in a video streaming service.	10	U1
4(a)	Explain disaster recovery mechanisms enabled by virtualization. Simulate a recovery scenario for a financial system and calculate the time required to restore services.	10	U2
4(b)	Describe the Publish-Subscribe model and its implementation in real-time systems. Simulate its use in a stock trading application and compute latency for 1 million events.	10	U2
5(a)	Compare public, private, and hybrid cloud models. Conduct a cost analysis for a company transitioning to a hybrid model.	10	U3
5(b)	Describe layered cloud architecture design. Analyze its implementation in an online education platform.	10	U3
6(a)	Evaluate security challenges in cloud computing. Analyze a case study involving a data breach in a SaaS platform.	10	U4
6(b)	Analyze the global exchange of cloud resources. Propose a model to optimize resource allocation and compute the efficiency improvement.	10	U4
7(a)	Discuss the programming environment of Google App Engine. Simulate the deployment of a web application scaling to 100,000 daily users.	10	U5
7(b)	Explain the Hadoop MapReduce framework. Calculate the processing time for a 1 TB dataset with specified Map and Reduce tasks.	10	U5

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