POSSESION OF MOBILES IN EXAM IS UFM PRACTICE.

Name: _____ _____ **Enrollment No.:** _____

Jaypee Institute of Information Technology, Noida

T1 Examination, 2024
B.Tech VIII Semester

Course Title: Cloud Computing Essential: Azure & AWS **Maximum Time : 1 Hr.**
Course Code: 22B12CS422 **Maximum Marks : 20**

Course Outcomes:

CO.1	Recall the fundamentals of Cloud Computing, its applicability and architecture. (Remember)
CO.2	Understand the architecture and services of AWS, Azure and Google cloud platforms. (Understand)
CO.3	Apply the AWS, Azure and Google cloud platform to solve the real-world problems. (Apply)
CO.4	Analyze the AWS, Azure and Google cloud platform to solve the real-world problems. (Analyze)
CO.5	Create the applications using appropriate cloud platforms. (Create)

Q.1 [CO1] For the following scenarios which cloud computing service model would you recommend and why? **[3 marks]**

i) A startup company planning to develop a new web application. The development team consists of skilled developers but lacks expertise in managing infrastructure.
ii) A company wants to migrate its existing on-premises email system to the cloud to reduce maintenance overhead and improve scalability.
iii) A research institution needs to perform complex computational simulations requiring high-performance computing resources.

Q.2 [CO1] For the following scenarios which cloud computing deployment model would you recommend and why? **[4 marks]**

i) A company wants to migrate its existing legacy applications to the cloud while retaining control over the underlying infrastructure.
ii) A startup company with limited IT resources wants to quickly deploy a new web application without investing in infrastructure.
iii) A multinational corporation with offices in different regions wants to ensure data sovereignty and compliance with local regulations.
iv) A small startup is developing a social media application expecting moderate, unpredictable user traffic. They need to choose a cloud deployment model for their infrastructure and highest level of control and customization.

Q.3 [CO1] You are tasked with designing a virtualized infrastructure for a medium-sized company that plans to migrate its on-premises servers to a virtual environment. The company's main requirements include scalability, high availability and cost-effectiveness.

i) Propose a solution that incorporates both Type-I and Type-II hypervisors. **[2 marks]**

ii) Justify your choice of hypervisor types and explain how they address the company's requirements. **[3 marks]**

Q.4 [CO4] Suppose you are tasked with deploying a web application on Amazon EC2. The application requires a moderate amount of CPU and memory resources. You have two EC2 instance types to choose form:

Instance Type A:	Instance Type B:
• CPU: 4 vCPUs • Memory: 8 GB • Cost per Hour: $0.20	• CPU: 2 vCPUs • Memory: 16 GB • Cost per Hour: $0.15

Additionally, you need to select an Amazon Machine Image (AMI) for your EC2 instances. You have two options:

AMI Option X:	AMI Option Y:
• Base Cost: $0.05 per hour • Additional Cost per GB of data transferred: $0.01	• Base Cost: $0.08 per hour • Additional Cost per GB of data transferred: $0.005

The application will run for 24 hours and transfer 10 GB of data per day, which instance type and AMI option would you choose to minimize costs while meeting the application's resource requirements and why? **[3 marks]**

Q.5 [CO2] i) Explain the concept of instance families in AWS EC2 and provide examples of different instance families. **[3 marks]**

ii) Suppose you are designing the architecture for a web application that requires a balance of compute power and memory. The application serves dynamic content and handles moderate traffic. Which instance family and type would you recommend, and why? [2 marks]

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE

Name.... .... **Enrollment No....** .....

Jaypee Institute of Information Technology, Noida
T2 Examination, Even Semester 2024
B. Tech., 7th Semester
Maximum Time: 1 Hr

Course Title : Cloud Computing Essential : Azure &AWS
Course Code: 22B12CS422 **Maximum Marks : 20**

CO1	Recall the fundamental of Cloud Computing, its applicability and architecture. (Remember)
CO2	Understand the architecture and services of AWS, Azure and Google cloud platform. (Uderstand)
CO3	Apply the AWS , Azure and Google cloud platform to solve the real-world problem (Apply)
CO4	Analyze the AWS , Azure and Google cloud platform to solve the real-world problem . (Analyze)
CO5	Create the application using appropriate cloud platforms. (Create)

Note: Attempt all the questions.

Q1.[CO1] Choose the most appropriate S3 storage class in the following scenario also justify your choice **[5 Marks]**

A. The marketing team at a company needs to store large media files for a new advertising campaign

B.A Company needs to store log files from its application for compliance purposes which AWS storage class would be the most cost- effective choice for storing these logs ?

C. A company wants to store backup copies of its database for disaster recovery

D. Acompany needs to store data that is accessed frequently but can tolerate slightly lower durability.

E.A company wants to store data that is accessed infrequently and can tolerate longer retrieval times

Q2.[CO3] Design an IAM policy that grant access to read/write operation on S3 buckets only to user in the "DataScience" group. Additionally, ensure that users in the "Finance" group have read-only access to the same buckets . **[3 Marks]**

Q3.[CO2] Identify and explain three best practices for IAM configuration in AWS that would enhance the security posture of the financial institution that has recently migrated its infrastructure to AWS. The institution wants to ensure that its AWS environment complies with industry regulations and best practices **[3 Marks]**

Q4.[CO4] Which DynamoDB capacity mode would be a better fit (On-Demand or Provision) in the following scenario and why? **[2 Marks]**

A. You're building a mobile application with unpredictable user traffic spikes. These are times with very low activity and occasional burst of high activity.

B. You're running a mission critical e-commerce platform with consistent, high-volume traffic. Consistent performance is crucial for a smooth user experience.

Q5.[CO3] You're building a social media application where users can follow each other and see posts from those they follow .How can you design a DynamoDB table to efficiently retrieve a user's feed ? Briefly explain the trade-offs between different design approaches. **[2 Marks]**

Q6.[CO4] You're developing the a severless API using Azure Functions to process image uploads from a module application. Users upload image, and your function needs to resize the image and store it in Azure Blob Storage .

A. Which trigger would be most suitable for this scenario and why? **[1 Marks]**

B. Define the input binding to access the uploaded image data within your Azure Function code **[1 Marks]**

C. Define output binding to store the resized image in Azure Blob storage. **[1 Marks]**

Q7 [CO5] What are the Azure Durable Function and how does it maintain state between function execution ?You're building a Durable Function workflow to process uploaded images. The workflow involves resizing the image to multiple formats (says format1 and format2) and generating thumbnails. How can you design this workflow using Durable Functions with chaining ?**[2 Marks]**

POSSESION OF MOBILES IN EXAM IS UFM PRACTICE

Name _____ **Enrollment No.** _____

Jaypee Institute of Information Technolo.. ..oida

End Term Examination, 2024
B. Tech, VIII Semester

Course Title: Cloud Computing Essentials: Azure & AWS **Maximum Time: 2 hrs**
Course Code: 22B12CS422 **Maximum Marks: 35**

CO1	Recall the fundamentals of Cloud Computing, its applicability and architecture. (Remember)
CO2	Understand the architecture and services of AWS, Azure and Google cloud platform. (Understand)
CO3	Apply the AWS, Azure and Google cloud platform to solve the real-world problems. (Apply)
CO4	Analyze the AWS, Azure and Google cloud platform to solve the real-world problem. (Analyze)
CO5	Create the applications using appropriate cloud platforms. (Create)

Note: Attempt all the questions. State assumptions if any.

Q.1 A large manufacturing company is planning to implement an Internet of Things (IoT) solution to monitor and manage its production lines in real-time on cloud. They have factories located worldwide. Discuss the pros and cons of each cloud deployment model for this scenario. **[CO1 (Remembering), 3 Marks]**

Q.2 A healthcare organization is considering migrating its electronic health record (EHR) system to the cloud. Security and compliance with data privacy regulations are critical priorities. Discuss the potential advantages and disadvantages of each service model (IaaS, PaaS and SaaS) for this scenario. **[CO2 (Understanding), 3 Marks]**

Q.3 Design an SDN-based network architecture for the university implementing high performance computing cluster for research, large lecture halls and smart building functionalities considering the needs of each category mentioned. Explain how you would utilize SDN principles to achieve the desired functionalities. **[CO2 (Understanding), 4 Marks]**

Q.4 You are working with a knowledge graph database in Gremlin. The graph contains information about movies, actors and directors. Movies are connected to actors through "actedIn" edges and to directors through "directedBy" edges. Write the query for the following use cases: **[CO3 (Applying), 3 Marks]**

i) Insert a node for the actor with first name as- "Brad" and last name as "Pitt" with property actor id as 2 and age 60.
ii) Insert a "actedIn" edge between actor – 'Brad' and movie – 'Snatch'.
iii) List all the directors in descending order of their first names.

Q.5 Your company manages a critical healthcare application on GCP. The application utilizes Compute engine instances, Cloud SQL databases containing sensitive patient data, Cloud Storage buckets for medical images, and Cloud Functions for automated tasks. You need to design a secure and scalable resource hierarchy in IAM

to ensure the strict access control and compliance with healthcare regulations. Draw a resource hierarchy diagram and answer the following: **[CO4 (Analyzing), 8 Marks]**

i) What IAM entities (users, groups, service accounts) will you create?

ii) How will you leverage folders and IAM conditions for granular access control?

iii) Describe the roles you will assign to different entities.

iv) How will you implement separation of duties for development, testing and production?

v) Explain your strategy for auditing and monitoring IAM activity.

Q.6 Choose the appropriate Google cloud services in the following scenarios and explain why. **[CO4 (Analyzing), 5 Marks]**

i) A travel agency wants to offer its website and booking platform in multiple languages to cater to international customers.

ii) A company wants to perform real-time data processing on streaming data from various sources such as IoT devices and logs.

iii) A company wants to build real-time messaging system to handle high volumes of data from IoT devices.

iv) A team wants to create a Hadoop cluster on demand for a short-lived data processing task.

v) Company X is creating an application that will analyze the comments on their Facebook profiles. They want to use the easiest way to analyze whether there are any negative comments.

Q.7 Create a GKE cluster named – 'my-nginx-cluster' using cloud CLI and deploy a simple Nginx web server application with three Pods for redundancy. Show all the necessary steps including – creating a Dockerfile, deployment.yaml file, deploying and running the application. Answer the following based on your deployed application:

[CO5 (Applying), 6 Marks]

i) What needs to be done in case you want to access the application from external IP.

ii) A demand for your application increases and you want to scale it up.

iii) What if you want to enable autoscaling functionality now.

Test each step using appropriate commands involved in it.

Q.8 Compare the data storage and management solution on each of the cloud platforms- AWS, Azure and GCP. **[CO4 (Analyzing), 3 Marks]**