POKHARA UNIVERSITY

Level: Bachelor | Year : | Full Marks : 100

Programme: BE | Semester: | Pass Mark : 45

Time : 3 Hrs.

Course: Cloud Application and Development Foundation

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

1. a) Compare distributed, collaborative, and cloud computing paradigms. Highlight key challenges in transitioning from traditional systems to cloud-native architectures. 8

   b) Discuss the role of IAM in cloud security. Provide steps to configure granular access controls for a virtual machine. 7

2. a) Differentiate vertical and horizontal scaling. Illustrate how auto-scaling manages sudden traffic spikes. 8

   b) Describe the steps to containerize an application using Docker or Podman. What is the role of Kubernetes in orchestration? 7

3. a) Construct a CI/CD pipeline for an web app deployed on a cloud platform of your choice. 8

   OR

   Describe the CI/CD pipeline for a containerized application. Include diagrams for build, test, and deploy phases.

   b) What is the significance of using version control systems in a cloud environment? Consider a scenario for demonstrating the use of various git functionalities. 7

4. a) How do RESTful APIs facilitate microservices architecture? Design an API endpoint for a cloud-based e-commerce app. 8

   b) What are the key differences between traditional and cloud-native databases? Discuss use cases for DynamoDB vs. RDS. 7

5 a) Mention CAP theorem trade-offs in NoSQL databases and design a sharding strategy for a high-traffic MongoDB deployment. 8

   b) What is auto-scaling? Provide a step-by-step guide to configure auto-scaling in a cloud environment. 7

6 a) Explain the concept of serverless computing. Compare AWS Lambda, Azure Functions, and GCP Cloud Functions. 8

   b) Discuss the use of Google Kubernetes Service in GCP. How do AWS VPC and Azure VNet ensure network isolation? 7

7 Short Notes (Any Two) 2x5

   a) Cloud Architectures

   b) Data portability

   c) Azure Blob Storage vs. AWS S3

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[MARKS ALLOCATION TABLE]

Unit	Lecture Hours	Question Numbers	Marks of Questions	Total
1. Introduction	4	1a, 7a	8 + 5	13
2. Cloud Service Administration	4	1b, 2a	7 + 8	15
3. Applications in the Cloud	8	2b, 3a, 3b, 4a	7+ 8+ 7 + 8	30
4. Data Management	4	4b, 5a	7 + 8	15
5. Cloud Computing Standards	4	5b, 7b	7 + 5	12
6. AWS, GCP and Azure	6	6a, 6b, 7c	8 + 7 + 5	20