



- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer ALL Questions

(10 X 10 = 100 Marks)

1. Cloud computing represents a transformative IT paradigm. It offers seamless access to servers, networks, storage, development tools via the internet that saves hefty investment in infrastructure." Justify.
2. A company is developing a mobile app that needs to handle varying loads of user traffic and requires fast deployment times. What type of cloud deployment be appropriate for their needs? What specific benefits could it provide in terms of deployment speed, availability and scalability?
3. A research lab dealing with atmospheric data involves in data analysis and climate prediction in the cloud. Apply NIST cloud architecture to this scenario and elaborate each component.
4. Your organization is consolidating two data centres into one. You need to migrate VMs from the old data centre to the new one. What factors would you consider when planning the migration? How would you ensure minimal downtime during the migration process?
5. Climate change prediction has become an important science, fundamental to the success of agriculture, virtually every other aspect of human enterprise. If you are to design a Hadoop Distributed File System, what are the requirements that would be addressed?
6. You are a DevOps engineer at a software development company that builds microservices-based applications. The team has faced issues with inconsistencies in environments when deploying applications across development, testing, and production. This has led to delays in shipping new features and bug fixes. The management has decided to use Docker to containerize the applications, ensuring that they run consistently regardless of the environment. How would you implement Docker to address the issue of environment inconsistencies?

7. You are the IT manager for a mid-sized enterprise that operates its own data center. Your team is tasked with managing a diverse set of applications and services, each with varying resource demands and compliance requirements. Currently, many processes, such as server provisioning, configuration management, and security updates, are handled manually, leading to inefficiencies and a higher risk of errors. To enhance operational efficiency, reduce costs, and improve service reliability, you are considering implementing automation within your data center operations.
- a) How would you approach the automation of your data center to achieve these goals?
  - b) What specific processes would you prioritize for automation, and which tools or methodologies would you employ to ensure a successful transition?
8. Imagine you are working as a cloud security engineer for a rapidly growing company. The company is in the process of migrating its on-premise infrastructure to a cloud service provider like AWS, Azure, or Google Cloud. The company handles sensitive data, including customer personal information and financial records, which must comply with industry regulations such as GDPR or HIPAA. The management has asked you to ensure the security of the data and applications in the cloud. List out the various types of threats in cloud environment. What specific cloud security practices and tools would you implement to safeguard data, maintain compliance, and prevent unauthorized access?
- 9.a) What are the different methods of processor virtualization? Compare and contrast the methods with an appropriate example.

OR

- 9.b) Given a dataset of product reviews, you want to find the top N products based on average ratings. How would you implement this using MapReduce, and what would your mapper and reducer functions look like?
- 10.a) Netflix's user base grows by 10 million users overnight. How would you design a micro services architecture to scale its recommendation engine, ensuring 99.99% uptime and handling 100,000 concurrent requests?

OR

- 10.b) Your company has a multi-cloud strategy and is interested in incorporating serverless solutions across different platforms. What considerations should you take into account when designing a serverless application that spans multiple cloud providers?

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