Mid-Semester Test
(EC-2 Regular)

Course No.   : CSI ZG527
Course Title   : Cloud Computing
Nature of Exam   : Closed Book
Weightage   : 35%
Duration   : 2 Hours
Date of Exam   : 17/03/2024 (AN)

| No. of Pages   = 2 |
| No. of Questions = 7 |

Note to Students:
1. Please follow all the *Instructions to Candidates* given on the cover page of the answer book.
2. All parts of a question should be answered consecutively. Each answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Q.1   Let's imagine a retail company with a complex IT infrastructure. They run an online store on a public cloud platform (like Amazon Web Services or Microsoft Azure or any other), but also have internal applications running on servers in their own data center. This is a hybrid cloud environment. As a cloud expert, suggest how the company can improve its Cloud security posture (CSP)? **<u>Be Brief</u>**   **5 Marks**

Q.2   Read the below case study and answer the questions   **1+1+3 Marks**
       Case Study 1: E-Commerce Migration to the Cloud

       An e-commerce company that sells clothing and accessories online has been experiencing rapid growth in its customer base. Due to increased traffic and demand, the company's on-premises infrastructure is struggling to handle the load, resulting in frequent downtime and slow website performance.

       The company aims to migrate its e-commerce platform to the cloud to improve scalability, reliability, and performance while reducing operational costs.

       The company has decided to migrate its e-commerce platform to a cloud infrastructure provider. They opt for a scalable and cost-effective solution that allows them to easily adjust resources based on demand. The cloud platform offers managed services for databases, storage, and content delivery to optimize performance and minimize maintenance efforts.
       2.1 What challenges was the e-commerce company facing with its on-premises infrastructure?
       2.2 What are the key benefits the company expects to achieve by migrating to the cloud?
       2.3 How will the company ensure data security and compliance in the cloud environment.

Q.3   Briefly discuss the role played by early technologies like grid computing, web hosting and mobile computing in the evolution of modern-day cloud computing. Your answer should be relevant to the growth of cloud computing.   **5 Marks**

Q.4   Your company has developed a new mobile app that has become very popular in a short amount of time. The app is hosted on a cloud platform that is experiencing intermittent connectivity issues. As a result, some users are unable to access the app or experience slow performance. The issue is impacting the company's reputation and revenue. As the

CTO, you are tasked with addressing the issue and ensuring that the app is highly available and performs well. Identify the root cause of the connectivity issues, and describe the steps you would take to resolve the issue   **5 Marks**

Q.5   Hypervisors are the software layer which enables the creation of VM's. Answer the below based on hypervisors   **2 + 3 Marks**
   a. Do you agree with the above statement? Justify your answer.
   b. Out of the below three, Server, OS and Application virtualization, which has the most impact on cloud computing. Explain why.

Q.6   Answer the below questions in short.   **3+2 Marks**
   a. Currently organizations are adopting a multi-cloud strategy. What do you understand by multi-cloud strategy? Briefly describe the challenges in a multi-cloud setup.
   b. Differentiate between trap & Emulate and Binary Translation. Why was BT required when Trap & Emulate was already present?

Q.7   ABC's web application is deployed in a virtual server cluster that comprised of 4 virtual servers running on 2 dedicated physical servers. The purchase price of each physical server hosting the application is Rs 7500, while the software cost is Rs 30500. Setup and application deployment charges are Rs 5500. Ongoing monthly costs are Rs 750 (environmental fees), Rs 520 (licensing fees), Rs 100 (hardware maintenance) and Rs 2600 (labor).
If the servers are leased from the cloud provider, labor costs are Rs 5500 which includes. expenses for solving interoperability issues and application setup. Monthly charges are usage fee calculated per virtual server at a rate of Rs 1.25 / hour per virtual server. The application consumption is equivalent to 2.3 servers when server instance scaling is factored in. The monthly database usage fee is Rs 327. The network usage fee is Rs 0.10 / GB per month and monthly volume is 420 GB. Labor cost per month is Rs 800. Assume that the application needs to be maintained for three-year period.   **5 Marks**

   a. What is the total cost of the on-premise infrastructure?
   b. Which approach is cost efficient? Justify by calculating the costs

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