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# B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

## January / February 2025 Semester End Main Examinations

**Programme: B.E.**

**Semester: VII**

**Branch: Computer Science and Engineering**

**Duration: 3 hrs.**

**Course Code: 22CS7PCCCT / 21CS7PECCT**

**Max Marks: 100**

**Course: Cloud Computing**

**Instructions:** 1. Answer any FIVE full questions, choosing one full question from each unit.  
2. Missing data, if any, may be suitably assumed.

| <b>UNIT - I</b>  |    |  | <b>CO</b>  | <b>PO</b>  | <b>Marks</b> |
|------------------|----|--|------------|------------|--------------|
| 1                | a) | Define Cloud Computing. List the five essential characteristics of Cloud Computing as identified by NIST Solution.   | <i>CO1</i> | <i>PO1</i> | <b>6</b>     |
|                  | b) | Apply the knowledge of Cloud service and Cloud deployment models to identify suitable service model and deployment model for the following applications:<br>➤ Cloud computing for Government<br>➤ Cloud computing for Manufacturing Industry | <i>CO2</i> | <i>PO2</i> | <b>6</b>     |
|                  | c) | Analyze and differentiate among various replication approaches provided by cloud with the help of a neat diagram.  | <i>CO2</i> | <i>PO2</i> | <b>8</b>     |
| <b>OR</b>        |    |  |            |            |              |
| 2                | a) | By applying the knowledge of various Cloud service models, identify the benefits, characteristics and adoption levels of each service model.   | <i>CO1</i> | <i>PO1</i> | <b>6</b>     |
|                  | b) | Identify the problem in load balancing while handling session-based applications. Describe how these problems are overcome by various persistence approaches.  | <i>CO2</i> | <i>PO2</i> | <b>6</b>     |
|                  | c) | Justify how SDN architecture is beneficial compare to Conventional network architecture with a diagram.  | <i>CO2</i> | <i>PO2</i> | <b>8</b>     |
| <b>UNIT - II</b> |    |  |            |            |              |
| 3                | a) | Differentiate among the following approaches in which virtualization can simulate the interface to a physical object:<br>➤ Multiplexing<br>➤ Aggregation<br>➤ Emulation<br>➤ Multiplexing with emulation                                     | <i>CO2</i> | <i>PO2</i> | <b>6</b>     |
|                  | b) | Describe the functionality of layering and interfaces among the software components and the hardware with a diagram.   | <i>CO2</i> | <i>PO2</i> | <b>6</b>     |

**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

|   |    |   |   |     |          |          |  |
|---|----|---|---|-----|----------|----------|--|
|   |    | c)  | Demonstrate the working of Xen VMM with a neat diagram.   | CO2 | PO2      | <b>8</b> |  |
|   |    |   | <b>OR</b>   |     |          |          |  |
| 4 | a) | Analyze and describe the taxonomy of Process virtual machines and System virtual machines with a diagram.   | CO1   | PO1 | <b>6</b> |          |  |
|   | b) | Differentiate between Full Virtualization and Para Virtualization with a neat diagram.  | CO2   | PO2 | <b>6</b> |          |  |
|   | c) | Identify the problems faced by virtualization of x86 architecture. Justify how these problems are solved through different mechanisms with the help of a neat diagram.  | CO2   | PO2 | <b>8</b> |          |  |
|   |    |   | <b>UNIT - III</b>   |     |          |          |  |
| 5 | a) | Illustrate with an example the different phases of SLA life cycle.  | CO1   | PO1 | <b>6</b> |          |  |
|   | b) | Differentiate between Infrastructure SLA and Application SLA.   | CO3   | PO3 | <b>6</b> |          |  |
|   | c) | Demonstrate how distributed VMs can be managed and dynamically deployed for an application using Inter-Grid Managed Infrastructure with a diagram.  | CO3   | PO3 | <b>8</b> |          |  |
|   |    |   | <b>OR</b>   |     |          |          |  |
| 6 | a) | Discuss the functionality of the six layers of extended cloud computing services along with the major providers with a diagram.   | CO1   | PO1 | <b>6</b> |          |  |
|   | b) | With a neat diagram show the interactions among VM managers for cloud creation and management and explain in detail.  | CO3   | PO3 | <b>6</b> |          |  |
|   | c) | An application is hosted on the cloud platform, which needs to be monitored using SLA. Illustrate with a flow diagram, the different activities performed under feasibility study and on-boarding phases of the application deployment.   | CO3   | PO3 | <b>8</b> |          |  |
|   |    |   | <b>UNIT - IV</b>  |     |          |          |  |
| 7 | a) | List and explain various Defense in Depth cloud security design principles.   | CO1   | PO1 | <b>6</b> |          |  |
|   | b) | A cloud application was designed, developed and hosted on a cloud platform. After a certain period of time, the application was not able to deliver the intended services to its users. Also, the user's requests were not answered due to the application's unavailability. Analyze the various design considerations that the application designers must have considered before developing the application to avoid the problems mentioned above. | CO2   | PO2 | <b>6</b> |          |  |
|   | c) | “Software Security Assurance State-of-the-art Report (SOAR) summarizes properties and behaviour for security testing verification”. Justify your answer.  | CO2   | PO2 | <b>8</b> |          |  |
|   |    |   | <b>OR</b>   |     |          |          |  |
|   | 8  | a)  | Identify and elaborate on the areas related to confidentiality which is one of the important pillars in cloud software assurance. | CO1 | PO1      | <b>6</b> |  |

|                 |    |    |   |     |     |           |
|-----------------|----|----|---|-----|-----|-----------|
|                 |    | b) | Analyze and discuss the various design consideration to be kept in mind if dynamic scaling is the important factor.   | CO2 | PO2 | <b>6</b>  |
|                 |    | c) | For the below given application scenario, identify the most appropriate cloud reference architecture. Justify your answer. Also, explain the same with necessary diagrams.<br><br>➤ Government of India has developed a new scheme for start-ups that helps many unemployed youths to think of bringing their ideas into reality. Government has planned to provide loans through their partner banks to the youths which they can pay as part payment. | CO2 | PO2 | <b>8</b>  |
| <b>UNIT - V</b> |    |    |   |     |     |           |
|                 | 9  | a) | Demonstrate with a neat diagram the second step in migrating the reporting service to an event-driven architecture.   | CO1 | PO1 | <b>10</b> |
|                 |    | b) | Kubernetes API is important? Justify your answer.   | CO2 | PO2 | <b>10</b> |
| <b>OR</b>       |    |    |   |     |     |           |
|                 | 10 | a) | Based on the functionality, differentiate among the following components of Kubernetes architecture with a diagram.<br><br>➤ Clusters<br>➤ Nodes<br>➤ Namespace<br>➤ Labels   | CO1 | PO1 | <b>10</b> |
|                 |    | b) | Identify the architecture that is similar to event-based architecture but is built using reusable components and communicates through a decoupled medium like network or service bus and with a neat diagram show the typical organization of the same and explain.   | CO2 | PO2 | <b>10</b> |

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