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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| **Date:** 13 – 01- 2025 **Time:** 09:30 am – 12:30 pm |

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| **School:** SOCSE | **Program:** B. Tech. CIT | |
| **Course Code:** CSE2032 | **Course Name: :** Introduction to Fog Computing | |
| **Semester**: V | **Max Marks**: 100 | **Weightage**: 50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **24** | **24** | **26** | **26** | **--** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

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| **Answer ALL the Questions. Each question carries 2marks. 10Q x 2M=20M** | | | | |
| **1** | List two common issues and challenges associated with implementing Fog Computing. | **2 Marks** | **L1** | **CO1** |
| **2** | Outline any two benefits of using Fog Computing over Cloud Computing. | **2 Marks** | **L1** | **CO1** |
| **3** | What is the role of Pre-Processing Layer in Fog Architecture? | **2 Marks** | **L1** | **CO2** |
| **4** | Define macrocell, microcell and  picocell in Cellular Networks? | **2 Marks** | **L1** | **CO2** |
| **5** | Why is network slicing crucial for 5G services? | **2 Marks** | **L1** | **CO3** |
| **6** | What is the role of Network Function Virtualization (NFV) in network slicing? | **2 Marks** | **L1** | **CO3** |
| **7** | How does network slicing contribute to the efficient use of network resources? | **2 Marks** | **L1** | **CO3** |
| **8** | List any four characteristics of Big Data. | **2 Marks** | **L1** | **CO4** |
| **9** | Define Big Data Analytics in the context of Fog Computing. | **2 Marks** | **L1** | **CO4** |
| **10** | What are the key components of the IoT stack model? | **2 Marks** | **L1** | **CO4** |

**Part B**

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| **Answer the Questions Total 80 Marks.** | | | | | |
| **11.** | **a** | Illustrate the differences among cloud,edge and fog. | **10 Marks** | **L2** | **CO1** |
| **b** | Describe the hierarchical structure of Fog Computing and Edge Computing. | **10 Marks** | **L2** | **CO1** |
| **Or** | | | | | |  | **Discuss all the deployment models in Cloud Computing in detail with examples.** |
| **12.** | **a** | Describe Resource Management and Edge Orchestration. | **10 Marks** | **L2** | **CO1** |
| **b** | Compare and contrast the data processing approaches of the Distributed Fog Model and the Hierarchical Fog Model. | **10 Marks** | **L2** | **CO1** |
|  |  |  |  |  |  |
| **13.** | **a** | Elucidate two Long Range Technologies along with their respective characteristics. | **10 Marks** | **L2** | **CO2** |
|  | **b** | Describe in detail on IEEE 802.11 Standard architecture with appropriate diagrams. | **10 Marks** | **L3** | **CO2** |
| **or** | | | | | |
| **14.** | **a** | Identify the strengths and weaknesses of implementing a fog architecture in smart cities compared to traditional cloud computing models. | **10 Marks** | **L3** | **CO2** |
|  | **b** | Evaluate the advantages and disadvantages of using LPWAN for long-range communication in low-power devices. | **10 Marks** | **L3** | **CO2** |

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| **15.** | **a** | Discuss the growing demand for middleware in Fog and Edge computing. Explain how it contributes to addressing challenges such as heterogeneity, scalability and real-time processing | **10 Marks** | **L2** | **CO3** |
|  | **b** | Model a framework for efficient management and orchestration of network slices in a multi-layered infrastructure involving 5G, Fog, Edge and Cloud. Discuss the potential benefits and challenges of your framework. | **10 Marks** | **L3** | **CO3** |
| **Or** | | | | | |
| **16.** | **a** | Describe the architecture and key components involved in 5G network slicing. | **10 Marks** | **L2** | **CO3** |
|  | **b** | What challenges might you face in managing slices across Edge and Fog environments and how would you address them? | **10 Marks** | **L2** | **CO3** |

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| **17.** | **a** | Illustrate how Fog Computing enables real-time decision-making in transportation. | **10 Marks** | **L3** | **CO4** |
|  | **b** | Your organization needs to comply with industry-specific regulations and standards. How do you ensure that the edge cloud architecture meets these compliance requirements and how do you stay abreast of evolving regulations that may impact the security landscape? | **10 Marks** | **L3** | **CO4** |
| **Or** | | | | | |
| **18.** | **a** | Illustrate how IoT integration with Edge Cloud reduces latency and enhances system response. | **10 Marks** | **L2** | **CO4** |
|  | **b** | A smart home system integrates IoT devices such as smart lights, security cameras and thermostats with Edge Cloud architecture for enhanced functionality and security. Explain the security mechanisms required to protect sensitive user data in this architecture. | **10 Marks** | **L3** | **CO4** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***