



**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**

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QUESTION BANK (DESCRIPTIVE)

Subject with Code: Fog Computing (20CS1210)

Regulation: R20

Course & Branch: B. Tech. - CSE – CCC

Year & Sem. : IV - I

UNIT –I

FOG COMPUTING FUNDAMENTALS

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|---|----|---|-----------|----|
| 1 | a) | Explain the concept of fog computing and how it extends the cloud to the edge of the network. | [L2, CO1] | 6M |
| | b) | Describe the main characteristics of fog computing and provide examples of its applications in real life. | [L1, CO1] | 6M |
| 2 | a) | Discuss the layered architecture of fog computing in detail, highlighting the role of each layer. | [L2, CO1] | 6M |
| | b) | Compare fog computing with cloud computing in terms of latency, scalability, and resource management. | [L4, CO1] | 6M |
| 3 | a) | Evaluate the need for fog computing in IoT environments with relevant use cases. | [L5, CO1] | 6M |
| | b) | Illustrate the components of fog computing architecture with a neat diagram. | [L6, CO1] | 6M |
| 4 | a) | Discuss the role of edge devices, fog nodes, and cloud servers in the fog computing ecosystem. | [L2, CO1] | 6M |
| | b) | Analyze the limitations of cloud computing that led to the emergence of fog computing. | [L4, CO1] | 6M |
| 5 | a) | Explain the relationship between fog computing and IoT, highlighting how fog improves IoT performance. | [L2, CO1] | 6M |
| | b) | Describe the different types of services provided by fog computing environments. | [L1, CO1] | 6M |
| 6 | a) | Discuss the security and privacy challenges in fog computing architecture. | [L2, CO1] | 6M |
| | b) | Explain how resource estimation plays a critical role in fog computing for IoT applications. | [L2, CO1] | 6M |
| 7 | a) | Evaluate the impact of fog computing on reducing latency and improving real-time data processing. | [L5, CO1] | 6M |
| | b) | Differentiate between centralized and decentralized fog computing models with examples. | [L4, CO1] | 6M |

8	a)	Discuss the importance of interoperability and scalability in fog computing deployment.	[L3, CO1]	6M
	b)	Describe various communication protocols used in fog computing for IoT data transfer.	[L2, CO1]	6M
9	a)	Explain how fog computing supports mobility in IoT-based applications.	[L2, CO1]	6M
	b)	Analyze the role of virtualization in fog computing and its benefits for IoT applications.	[L4, CO1]	6M
10	a)	Justify the integration of fog computing in smart city infrastructure with examples.	[L5, CO1]	6M
	b)	Design a basic fog computing model for a real-time traffic monitoring system.	[L6, CO1]	6M

UNIT –II

ARCHITECTURE AND RESOURCE MANAGEMENT

1	a)	What is the need for Fog Computing in IoT?	[L1, CO2]	6M
	b)	List and explain the components in a fog computing architecture.	[L2, CO2]	6M
2	a)	Explain the basic architecture of Fog-IoT integration.	[L2, CO2]	6M
	b)	Describe how fog computing supports real-time data processing.	[L2, CO2]	6M
3	a)	Use fog architecture to explain an IoT-based smart building setup.	[L2, CO2]	6M
	b)	Identify and discuss on the major IoT challenges addressed by fog computing.	[L2, CO2]	6M
4	a)	Explain the role of fog nodes in IoT applications.	[L2, CO2]	6M
	b)	Compare fog and cloud in terms of resource utilization.	[L4, CO2]	6M
5	a)	Illustrate the fog components in a hierarchical structure.	[L3, CO2]	6M
	b)	Evaluate the effectiveness of resource estimation models in fog.	[L5, CO2]	6M
6	a)	Explain how fog reduces latency in IoT systems.	[L2, CO2]	6M
	b)	List and explain different types of resources considered in fog computing.	[L2, CO2]	6M
7	a)	Demonstrate resource allocation in a smart home system.	[L3, CO2]	6M
	b)	Compare static and dynamic resource estimation techniques.	[L4, CO2]	6M
8	a)	Justify the use of fog in critical IoT applications.	[L5, CO2]	6M
	b)	Create a model showing fog device interactions in a smart city.	[L6, CO2]	6M
9	a)	Describe how memory and bandwidth are managed in fog devices.	[L2, CO2]	6M
	b)	Analyze how fog architecture reduces energy consumption.	[L4, CO2]	6M

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|----|----|--|-----------|----|
| 10 | a) | Test a resource-scheduling algorithm in a fog environment. | [L5, CO2] | 6M |
| | b) | Design a resource-aware fog system for smart parking. | [L6, CO2] | 6M |

UNIT –III

DATA MANAGEMENT IN FOG COMPUTING

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|----|----|---|-----------|----|
| 1 | a) | Define and explain data preprocessing in fog computing. | [L2, CO3] | 6M |
| | b) | List and discuss types of data generated by IoT sensors in detail. | [L2, CO3] | 6M |
| 2 | a) | Illustrate the steps involved in data analytics at the fog layer. | [L3, CO3] | 6M |
| | b) | Describe how fog handles data storage. | [L2, CO3] | 6M |
| 3 | a) | Apply various data filtering techniques in fog data preprocessing. | [L3, CO3] | 6M |
| | b) | Identify and evaluate the need for data privacy in fog environments. | [L5, CO3] | 6M |
| 4 | a) | Explain the role of local storage in fog devices. | [L2, CO3] | 6M |
| | b) | Compare raw data processing in fog vs cloud. | [L4, CO3] | 6M |
| 5 | a) | Illustrate in detail the stages of data flow from sensors to fog nodes. | [L3, CO3] | 6M |
| | b) | Evaluate privacy-preserving techniques used in fog computing. | [L5, CO3] | 6M |
| 6 | a) | Describe real-time analytics at fog nodes. | [L2, CO3] | 6M |
| | b) | List and explain the challenges in managing big data at the fog layer. | [L2, CO3] | 6M |
| 7 | a) | Demonstrate a use case of data processing in smart health. | [L3, CO3] | 6M |
| | b) | Analyze the trade-offs between local and cloud storage. | [L4, CO3] | 6M |
| 8 | a) | Discuss about various encryption methods used for fog data. | [L2, CO3] | 6M |
| | b) | Create a data flow diagram for an e-health fog application. | [L6, CO3] | 6M |
| 9 | a) | Explain how fog supports caching and temporary storage. | [L2, CO3] | 6M |
| | b) | Compare fog data placement strategies. | [L4, CO3] | 6M |
| 10 | a) | Justify the use of edge analytics in fog computing. | [L5, CO3] | 6M |
| | b) | Plan a privacy-aware fog-based health data system. | [L6, CO3] | 6M |

UNIT –IV**PREDICTIVE ANALYSIS TO SUPPORT FOG APPLICATION DEPLOYMENT**

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|----|----|--|-----------|----|
| 1 | a) | Define and discuss about predictive analysis in fog computing. | [L2, CO4] | 6M |
| | b) | What is the purpose of FogTorchII? | [L1, CO4] | 6M |
| 2 | a) | Explain how iFogSim works. | [L2, CO4] | 6M |
| | b) | Describe a smart building use case using fog. | [L2, CO4] | 6M |
| 3 | a) | Apply iFogSim for a smart home environment. | [L3, CO4] | 6M |
| | b) | Identify the advantages and disadvantages of predictive analytics. | [L1, CO4] | 6M |
| 4 | a) | Explain how FogTorchII helps in application placement. | [L2, CO4] | 6M |
| | b) | Compare iFogSim and FogTorchII in terms of features. | [L4, CO4] | 6M |
| 5 | a) | Analyze application modules in iFogSim. | [L4, CO4] | 6M |
| | b) | Evaluate fog deployment using simulation tools. | [L5, CO4] | 6M |
| 6 | a) | List and discuss the inputs required for deploying an app in FogTorchII. | [L2, CO4] | 6M |
| | b) | Describe the simulation setup for fog application testing. | [L2, CO4] | 6M |
| 7 | a) | Illustrate the usage of iFogSim to measure latency and throughput. | [L3, CO4] | 6M |
| | b) | Analyze the simulation outputs of FogTorchII. | [L4, CO4] | 6M |
| 8 | a) | Evaluate the performance of applications in iFogSim. | [L5, CO4] | 6M |
| | b) | Design a fog deployment scenario using FogTorchII. | [L6, CO4] | 6M |
| 9 | a) | Explain the metrics used for fog simulation evaluation. | [L3, CO4] | 6M |
| | b) | Compare energy models in iFogSim and FogTorchII. | [L4, CO4] | 6M |
| 10 | a) | Justify the use of predictive analysis in real-time fog apps. | [L5, CO4] | 6M |
| | b) | Create a deployment plan for a fog-enabled smart campus. | [L6, CO4] | 6M |

UNIT –V**FOG FOR HEALTH MONITORING & SMART TRANSPORT**

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|---|----|--|-----------|----|
| 1 | a) | Discuss fog computing's role in healthcare? | [L2, CO5] | 6M |
| | b) | Define and describe Intelligent Transportation Systems (ITS). | [L2, CO5] | 6M |
| 2 | a) | Describe the architecture of a fog-based health monitoring system. | [L2, CO5] | 6M |
| | b) | Explain the function of smart e-health gateways. | [L2, CO5] | 6M |

3	a)	Apply fog computing to detect patient falls.	[L3, CO6]	6M
	b)	Identify the challenges in smart transport applications.	[L1, CO5]	6M
4	a)	Explain fog services used in e-health gateways.	[L2, CO5]	6M
	b)	Compare cloud and fog for health data processing.	[L4, CO6]	6M
5	a)	Discuss the various components of an ITLM system.	[L2, CO6]	6M
	b)	Evaluate mission-critical computing needs in transport.	[L5, CO6]	6M
6	a)	List and discuss various sensors used in fog-based health monitoring.	[L2, CO5]	6M
	b)	Describe system implementation for patient tracking.	[L2, CO5]	6M
7	a)	Demonstrate fog application in ambulance dispatch system.	[L3, CO5]	6M
	b)	Analyze delay sensitivity in smart traffic lights.	[L4, CO6]	6M
8	a)	Critically evaluate human fall detection system.	[L5, CO5]	6M
	b)	Design a fog-based traffic control system.	[L6, CO6]	6M
9	a)	Explain real-time analytics for transport data.	[L2, CO6]	6M
	b)	Compare health data security in fog vs cloud.	[L4, CO5]	6M
10	a)	Justify using fog in time-sensitive transportation apps.	[L5, CO6]	6M
	b)	Develop a smart fog framework for urban mobility.	[L6, CO6]	6M

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