



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

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QUESTION BANK (DESCRIPTIVE)

Subject with Code: Fog Computing (23CS1206)

Regulation: R23

Course & Branch: B. Tech. - CSE – CCC

Year & Sem. : III - II

UNIT –I

FOG COMPUTING FUNDAMENTALS

- | | | | | |
|---|----|---|-----------|----|
| 1 | a) | Define Fog Computing. List any two characteristics of fog computing. | [L1, CO1] | 2M |
| | b) | Explain the relationship between Fog Computing and Cloud Computing in one or two sentences. | [L2, CO1] | 2M |
| | c) | Identify the main components of Fog Computing architecture and state the function of any one component. | [L2, CO2] | 2M |
| | d) | How is Fog Computing applied in a Smart Traffic Light System (STLS) or Wind Farm? Mention one advantage. | [L3, CO4] | 2M |
| | e) | Differentiate Fog Computing and Cloud Computing based on latency and data processing location. | [L4, CO3] | 2M |
| 2 | a) | Explain the concept of fog computing and how it extends the cloud to the edge of the network. | [L2, CO1] | 5M |
| | b) | Describe the main characteristics of fog computing and provide examples of its applications in real life. | [L1, CO1] | 5M |
| 3 | a) | Discuss the layered architecture of fog computing in detail, highlighting the role of each layer. | [L2, CO1] | 5M |
| | b) | Compare fog computing with cloud computing in terms of latency, scalability, and resource management. | [L4, CO1] | 5M |
| 4 | a) | Evaluate the need for fog computing in IoT environments with relevant use cases. | [L5, CO1] | 5M |
| | b) | Illustrate the components of fog computing architecture with a neat diagram. | [L5, CO1] | 5M |
| 5 | a) | Discuss the role of edge devices, fog nodes, and cloud servers in the fog computing ecosystem. | [L2, CO1] | 5M |
| | b) | Analyze the limitations of cloud computing that led to the emergence of fog computing. | [L4, CO1] | 5M |
| 6 | a) | Explain the relationship between fog computing and IoT, highlighting how fog improves IoT performance. | [L2, CO1] | 5M |

	b)	Describe the different types of services provided by fog computing environments.	[L1, CO1]	5M
7	a)	Discuss the security and privacy challenges in fog computing architecture.	[L2, CO1]	5M
	b)	Explain how resource estimation plays a critical role in fog computing for IoT applications.	[L2, CO1]	5M
8	a)	Evaluate the impact of fog computing on reducing latency and improving real-time data processing.	[L5, CO1]	5M
	b)	Differentiate between centralized and decentralized fog computing models with examples.	[L4, CO1]	5M
9	a)	Discuss the importance of interoperability and scalability in fog computing deployment.	[L3, CO1]	5M
	b)	Describe various communication protocols used in fog computing for IoT data transfer.	[L2, CO1]	5M
10	a)	Explain how fog computing supports mobility in IoT-based applications.	[L2, CO1]	5M
	b)	Analyze the role of virtualization in fog computing and its benefits for IoT applications.	[L4, CO1]	5M
11	a)	Justify the integration of fog computing in smart city infrastructure with examples.	[L5, CO1]	5M
	b)	Design a basic fog computing model for a real-time traffic monitoring system.	[L6, CO1]	5M

UNIT –II
ARCHITECTURE AND RESOURCE MANAGEMENT

1	a)	What is the background and motivation for introducing Fog Computing in IoT environments?	[L1, CO1]	2M
	b)	Define Fog Computing and mention any two basic features of fog computing.	[L1, CO1]	2M
	c)	What are Fog Computing services? List any two services provided by fog nodes.	[L2, CO2]	2M
	d)	Why is resource estimation important in Fog Computing for IoT applications? Mention one use case.	[L3, CO2]	2M
	e)	List any two challenges involved in fog resource estimation and briefly explain one.	[L4, CO2]	2M
2	a)	What is the need for Fog Computing in IoT?	[L1, CO2]	5M
	b)	List and explain the components in a fog computing architecture.	[L2, CO2]	5M
3	a)	Explain the basic architecture of Fog-IoT integration.	[L2, CO2]	5M
	b)	Describe how fog computing supports real-time data processing.	[L2, CO2]	5M
4	a)	Use fog architecture to explain an IoT-based smart building setup.	[L2, CO2]	5M
	b)	Identify and discuss on the major IoT challenges addressed by fog computing.	[L2, CO2]	5M
5	a)	Explain the role of fog nodes in IoT applications.	[L2, CO2]	5M
	b)	Compare fog and cloud in terms of resource utilization.	[L4, CO2]	5M
6	a)	Illustrate the fog components in a hierarchical structure.	[L3, CO2]	5M
	b)	Evaluate the effectiveness of resource estimation models in fog.	[L5, CO2]	5M
7	a)	Explain how fog reduces latency in IoT systems.	[L2, CO2]	5M
	b)	List and explain different types of resources considered in fog computing.	[L2, CO2]	5M
8	a)	Demonstrate resource allocation in a smart home system.	[L3, CO2]	5M
	b)	Compare static and dynamic resource estimation techniques.	[L4, CO2]	5M
9	a)	Justify the use of fog in critical IoT applications.	[L5, CO2]	5M
	b)	Create a model showing fog device interactions in a smart city.	[L6, CO2]	5M
10	a)	Describe how memory and bandwidth are managed in fog devices.	[L2, CO2]	5M
	b)	Analyze how fog architecture reduces energy consumption.	[L4, CO2]	5M
11	a)	Test a resource-scheduling algorithm in a fog environment.	[L5, CO2]	5M
	b)	Design a resource-aware fog system for smart parking.	[L6, CO2]	5M

UNIT –III**DATA MANAGEMENT IN FOG COMPUTING**

1	a)	What is Fog Data Management? State its importance in fog computing environments.	[L1, CO3]	2M
	b)	List any two characteristics of data generated in fog-based IoT systems.	[L2, CO3]	2M
	c)	What is data preprocessing in fog computing? Mention one preprocessing operation.	[L2, CO3]	2M
	d)	How does data privacy improve when data is processed at the fog layer instead of the cloud?	[L3, CO3]	2M
	e)	Explain how fog computing supports data storage and analytics in an E-Health case study.	[L4, CO4]	2M
2	a)	Define and explain data preprocessing in fog computing.	[L2, CO3]	5M
	b)	List and discuss types of data generated by IoT sensors in detail.	[L2, CO3]	5M
3	a)	Illustrate the steps involved in data analytics at the fog layer.	[L3, CO3]	5M
	b)	Describe how fog handles data storage.	[L2, CO3]	5M
4	a)	Apply various data filtering techniques in fog data preprocessing.	[L3, CO3]	5M
	b)	Identify and evaluate the need for data privacy in fog environments.	[L5, CO3]	5M
5	a)	Explain the role of local storage in fog devices.	[L2, CO3]	5M
	b)	Compare raw data processing in fog vs cloud.	[L4, CO3]	5M
6	a)	Illustrate in detail the stages of data flow from sensors to fog nodes.	[L3, CO3]	5M
	b)	Evaluate privacy-preserving techniques used in fog computing.	[L5, CO3]	5M
7	a)	Describe real-time analytics at fog nodes.	[L2, CO3]	5M
	b)	List and explain the challenges in managing big data at the fog layer.	[L2, CO3]	5M
8	a)	Demonstrate a use case of data processing in smart health.	[L3, CO3]	5M
	b)	Analyze the trade-offs between local and cloud storage.	[L4, CO3]	5M
9	a)	Discuss about various encryption methods used for fog data.	[L2, CO3]	5M
	b)	Create a data flow diagram for an e-health fog application.	[L6, CO3]	5M
10	a)	Explain how fog supports caching and temporary storage.	[L2, CO3]	5M
	b)	Compare fog data placement strategies.	[L4, CO3]	5M
11	a)	Justify the use of edge analytics in fog computing.	[L5, CO3]	5M
	b)	Plan a privacy-aware fog-based health data system.	[L6, CO3]	5M

UNIT –IV

PREDICTIVE ANALYSIS TO SUPPORT FOG APPLICATION DEPLOYMENT

1	a)	What is predictive analysis in the context of fog application deployment?	[L1, CO2]	2M
	b)	How does a smart building act as a motivating example for fog-based predictive analytics?	[L2, CO4]	2M
	c)	What is FogTorchII? Mention its primary purpose in fog computing.	[L2, CO2]	2M
	d)	How does FogTorchII support fog application deployment? Mention any one deployment constraint it considers.	[L3, CO4]	2M
	e)	Compare iFogSim and FogTorchII with respect to their role in fog application deployment analysis.	[L4, CO2]	2M
2	a)	Define and discuss about predictive analysis in fog computing.	[L2, CO4]	5M
	b)	What is the purpose of FogTorchII?	[L1, CO4]	5M
3	a)	Explain how iFogSim works.	[L2, CO4]	5M
	b)	Describe a smart building use case using fog.	[L2, CO4]	5M
4	a)	Apply iFogSim for a smart home environment.	[L3, CO4]	5M
	b)	Identify the advantages and disadvantages of predictive analytics.	[L1, CO4]	5M
5	a)	Explain how FogTorchII helps in application placement.	[L2, CO4]	5M
	b)	Compare iFogSim and FogTorchII in terms of features.	[L4, CO4]	5M
6	a)	Analyze application modules in iFogSim.	[L4, CO4]	5M
	b)	Evaluate fog deployment using simulation tools.	[L5, CO4]	5M
7	a)	List and discuss the inputs required for deploying an app in FogTorchII.	[L2, CO4]	5M
	b)	Describe the simulation setup for fog application testing.	[L2, CO4]	5M
8	a)	Illustrate the usage of iFogSim to measure latency and throughput.	[L3, CO4]	5M
	b)	Analyze the simulation outputs of FogTorchII.	[L4, CO4]	5M
9	a)	Evaluate the performance of applications in iFogSim.	[L5, CO4]	5M
	b)	Design a fog deployment scenario using FogTorchII.	[L6, CO4]	5M
10	a)	Explain the metrics used for fog simulation evaluation.	[L3, CO4]	5M
	b)	Compare energy models in iFogSim and FogTorchII.	[L4, CO4]	5M
11	a)	Justify the use of predictive analysis in real-time fog apps.	[L5, CO4]	5M
	b)	Create a deployment plan for a fog-enabled smart campus.	[L6, CO4]	5M

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

1	a)	What is the role of Fog Computing in health monitoring IoT-based systems?	[L1, CO4]	2M
	b)	Briefly describe the architecture of a fog-based E-Health monitoring system.	[L2, CO4]	2M
	c)	List any two fog computing services provided by Smart E-Health Gateways.	[L2, CO3]	2M
	d)	How is Fog Computing used in Human Fall Detection systems? Mention one advantage.	[L3, CO4]	2M
	e)	Explain how Fog Computing supports mission-critical requirements in Intelligent Traffic Lights Management (ITLM) systems.	[L4, CO4]	2M
2	a)	Discuss fog computing's role in healthcare?	[L2, CO5]	5M
	b)	Define and describe Intelligent Transportation Systems (ITS).	[L2, CO5]	5M
3	a)	Describe the architecture of a fog-based health monitoring system.	[L2, CO5]	5M
	b)	Explain the function of smart e-health gateways.	[L2, CO5]	5M
4	a)	Apply fog computing to detect patient falls.	[L3, CO6]	5M
	b)	Identify the challenges in smart transport applications.	[L1, CO5]	5M
5	a)	Explain fog services used in e-health gateways.	[L2, CO5]	5M
	b)	Compare cloud and fog for health data processing.	[L4, CO6]	5M
6	a)	Discuss the various components of an ITLM system.	[L2, CO6]	5M
	b)	Evaluate mission-critical computing needs in transport.	[L5, CO6]	5M
7	a)	List and discuss various sensors used in fog-based health monitoring.	[L2, CO5]	5M
	b)	Describe system implementation for patient tracking.	[L2, CO5]	5M
8	a)	Demonstrate fog application in ambulance dispatch system.	[L3, CO5]	5M
	b)	Analyze delay sensitivity in smart traffic lights.	[L4, CO6]	5M
9	a)	Critically evaluate human fall detection system.	[L5, CO5]	5M
	b)	Design a fog-based traffic control system.	[L6, CO6]	5M
10	a)	Explain real-time analytics for transport data.	[L2, CO6]	5M
	b)	Compare health data security in fog vs cloud.	[L4, CO5]	5M
11	a)	Justify using fog in time-sensitive transportation apps.	[L5, CO6]	5M
	b)	Develop a smart fog framework for urban mobility.	[L6, CO6]	5M