Course Code: 20CS1210 **R20**

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

1	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
2	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
3	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.	[L6, CO1]	5M
4	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
5	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
6	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
7	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

8	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
9	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
10	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 need for Fog Computing in IoT?	[L1, CO2]	5M
	b)	List and explain the components in a fog computing architecture.	[L2, CO2]	5M
2	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
3	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
4	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
5	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
6	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
7	a)	Demonstrate resource allocation in a smart home system.	[L3, CO2]	5M
	b)	Compare static and dynamic resource estimation techniques.	[L4, CO2]	5M
8	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
9	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

10	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)	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
2	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
3	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
4	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
5	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
6	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
7	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
8	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
9	a)	Explain how fog supports caching and temporary storage.	[L2, CO3]	5M
	b)	Compare fog data placement strategies.	[L4, CO3]	5M
10	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

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UNIT –IV

PREDICTIVE ANALYSIS TO SUPPORT FOG APPLICATION DEPLOYMENT

1	a)	Define and discuss about predictive analysis in fog computing.	[L2, CO4]	5M
	b)	What is the purpose of FogTorchΠ?	[L1, CO4]	5M
2	a)	Explain how iFogSim works.	[L2, CO4]	5M
	b)	Describe a smart building use case using fog.	[L2, CO4]	5M
3	a)	Apply iFogSim for a smart home environment.	[L3, CO4]	5M
	b)	Identify the advantages and disadvantages of predictive analytics.	[L1, CO4]	5M
4	a)	Explain how FogTorchΠ helps in application placement.	[L2, CO4]	5M
	b)	Compare iFogSim and FogTorchΠ in terms of features.	[L4, CO4]	5M
5	a)	Analyze application modules in iFogSim.	[L4, CO4]	5M
	b)	Evaluate fog deployment using simulation tools.	[L5, CO4]	5M
6	a)	List and discuss the inputs required for deploying an app in FogTorchΠ.	[L2, CO4]	5M
	b)	Describe the simulation setup for fog application testing.	[L2, CO4]	5M
7	a)	Illustrate the usage of iFogSim to measure latency and throughput.	[L3, CO4]	5M
	b)	Analyze the simulation outputs of FogTorchΠ.	[L4, CO4]	5M
8	a)	Evaluate the performance of applications in iFogSim.	[L5, CO4]	5M
	b)	Design a fog deployment scenario using FogTorchΠ.	[L6, CO4]	5M
9	a)	Explain the metrics used for fog simulation evaluation.	[L3, CO4]	5M
	b)	Compare energy models in iFogSim and FogTorchΠ.	[L4, CO4]	5M
10	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)	Discuss fog computing's role in healthcare?	[L2, CO5]	5M
	b)	Define and describe Intelligent Transportation Systems (ITS).	[L2, CO5]	5M
2	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

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

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