



Cloud Computing

Assignment- Week 9

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 10

Total mark: 10 X 1 = 10

QUESTION 1:

Which of the following statements best describes fog computing?

- a) Fog computing refers to a model where data, processing, and applications are concentrated in the cloud rather than at the network edge.
- b) Fog computing is a term introduced by Cisco Systems to describe a model that centralizes data processing in the cloud to manage wireless data transfer to distributed IoT devices.
- c) Fog computing is a model where data, processing, and applications are concentrated in devices at the network edge rather than existing almost entirely in the cloud.
- d) The vision of fog computing is to enable applications on a few connected devices to run directly in the cloud without interaction at the network edge.

Correct Answer: (c)

Detailed Solution: Fog computing is characterized by its focus on edge processing rather than cloud-centralized processing. Statement C correctly captures this aspect, making it the best description of fog computing among the provided options.

QUESTION 2:

Which of the following challenges is most effectively addressed by using fog and edge computing instead of a "cloud-only" approach for IoT applications?

- a) Resource management issues related to workload balance and task scheduling in cloud-based environments.
- b) The inefficiency of processing time-sensitive applications directly in the cloud due to high latency and large data bandwidth requirements.
- c) The need for improved security and privacy features in cloud-based systems, which are not addressed by fog and edge computing.
- d) The difficulty in integrating multiple cloud services and platforms for comprehensive IoT data management.

Correct Answer: (b)

Detailed Solution: Fog and edge computing offer solutions to the inefficiencies of processing time-sensitive applications in a "cloud-only" scenario by reducing latency and managing data bandwidth more effectively. Statement B best captures the challenge that fog and edge computing address.



QUESTION 3:

Which of the following correctly describes a classification of resource management architectures in fog/edge computing?

Threads of a process share

- a) Data Flow
- b) Control.
- c) Tenancy.
- d) Infrastructure.

Correct Answer: (c)

Detailed Solution: Tenancy is correctly described as the support for hosting multiple applications or a single application on an edge node.

QUESTION 4:

Which of the following characteristics is NOT typically associated with fog computing infrastructure?

- a) Location awareness and low latency
- b) Better bandwidth utilization
- c) High computational power concentrated solely in the Cloud
- d) Support for mobility

Correct Answer: (c)

Detailed Solution: High computational power concentrated solely in the Cloud is not a characteristic of fog computing; instead, fog computing distributes computational resources across edge nodes.

QUESTION 5:

In the fog computing paradigm, which of the following accurately describes the relationship between local and global analyses?

- a) Local analyses are performed exclusively in the Cloud, while global analyses are done at the edge devices.
- b) Local and global analyses are performed only in the Cloud data centers.
- c) Local analyses are performed at the edge devices, and global analyses can be either performed at the edge or forwarded to the Cloud.
- d) Local analyses are conducted by IoT devices, and global analyses are not necessary in fog computing.

Correct Answer: (c)

Detailed Solution: Local analyses in fog computing are performed at the edge devices to ensure low latency and quick processing. Global analyses can be either performed at the edge or forwarded to the Cloud for further processing, depending on the system's requirements and resource availability. Local and global analyses are not solely performed in the Cloud; they are distributed based on the needs of the application and infrastructure.

QUESTION 6:

What is the primary goal of the application placement problem in the Cloud-Fog-Edge framework?

- a) To map all applications onto the Cloud servers to maximize computational power.
- b) To find available resources in the network that satisfy application requirements, respect constraints, and optimize the objective, such as minimizing energy consumption.
- c) To place all application components on edge devices to ensure low latency.
- d) To disregard resource capacities and focus solely on network constraints.

Correct Answer: (b)

Detailed Solution: In the Cloud-Fog-Edge framework, application placement involves mapping components onto infrastructure while considering resource (CPU, RAM), network (latency, bandwidth), and application constraints (locality, delay sensitivity). The goal is to meet these constraints and optimize objectives like energy consumption. Application constraints, such as locality requirements, ensure specific services run in designated locations, making them key factors in the placement process.

QUESTION 7:

Which of the following is an example of an application constraint in the application placement problem on the Cloud-Fog-Edge framework?

- a) Finite capabilities of CPU and RAM on infrastructure nodes.
- b) Network latency and bandwidth limitations.
- c) Locality requirements restricting certain services' executions to specific locations.
- d) Availability of storage resources in the Fog nodes.

Correct Answer: (c)

Detailed Solution: Locality requirements are application constraints that restrict services to specific locations, making them key in application placement. In contrast, Option A deals with resource constraints, Option B with network constraints, and Option D with resource availability, none of which are application-specific constraints.

QUESTION 8:

What is the primary purpose of offloading in the context of edge computing?

- a) To move all data processing from edge nodes to the cloud.
- b) To augment computing requirements by moving servers, applications, and associated data closer to the network edge.
- c) To reduce the number of user devices connected to the network.
- d) To centralize all computational resources in the cloud for better performance.

Correct Answer: (b)



Detailed Solution: This question highlights the key purpose of offloading, which involves moving servers, applications, and data closer to the network edge to enhance computing capabilities and bring services closer to the data source, improving efficiency and reducing latency.

QUESTION 9:

What is the primary goal of a cloud federation?

- a) To centralize all cloud services under a single provider.
- b) To deploy and manage multiple cloud services to meet business needs by collaborating among different Cloud Service Providers (CSPs).
- c) To limit the geographical reach of cloud services.
- d) To reduce the number of cloud service providers globally.

Correct Answer: (b)

Detailed Solution: Cloud federation's goal is to efficiently manage and deploy cloud services by collaborating among multiple CSPs. This enhances capacity utilization, interoperability, and service offerings, unlike centralizing services under one provider.

QUESTION 10:

Which of the following is a key benefit of forming a cloud federation?

- a) Centralized control of global cloud services.
- b) Increased resource utilization and load balancing across multiple Cloud Service Providers (CSPs).
- c) Reduced collaboration among Cloud Service Providers.
- d) Limiting the geographical footprint of Cloud Service Providers.

Correct Answer: (b)

Detailed Solution: A key benefit of cloud federation is maximizing resource utilization and achieving effective load balancing across multiple CSPs, improving efficiency and reliability through shared resources.