CC Week 12

Spatial analysis is an attempt to solve _____ oriented problems

    a) Latency
    b) Location
    c) Storage
    d) Temporal

Correct Answer: b
Detailed Solution: Spatial analysis is an attempt to solve location‑oriented problems and a better understanding of where and what is occurring in the surrounding world/ region. – Beyond mapping - study the characteristics of places/ regions and the relationships between them.

Spatial analysis focuses on solving location-oriented problems by studying the characteristics of places or regions and the relationships between them.

QUESTION 1:
The health model is designed for fog-edge computing aims to reduce
    a) Network usage
    b) Demand aggregation
    c) Latency
    d) Cost

a, c, d
a health model could refer to a computational framework or system designed to monitor and manage the health-related data of devices, sensors, or systems within a network.

QUESTION 3:
The key aspect of the intelligent transportation system is efficient _____.
    a) cost
    b) latency
    c) mobility
    d) delivery

Correct Answer: c
Detailed Solution: The key aspect of the intelligent transportation system is efficient mobility.

QUESTION 4:

What is(are) the benefit(s) of 5G technology for enhanced mobile broadband?
 a) Lower cost-per-bit
 b) Slower data rates
 c) Higher latency
 d) Limited device compatibility

Correct Option: a

Detailed Solution: In addition to making our smartphones better, 5G mobile technology can usher in new immersive experiences such as VR and AR with faster, more uniform data rates, lower latency, and lower cost per bit.

QUESTION 5:

_____ is a paradigm where on-premises computers provide functionality that is independent of cloud services and is also collaborative with cloud services

 a) Distributed computing
 b) Edge computing
 c) Dew computing
 d) Fog computing

Correct Option: c

Detailed Solution: According to the definition given, dew computing is a paradigm where on-premises computers provide functionality that is independent of cloud services and is also collaborative with cloud services.

QUESTION 6:

Resource-constrained low-latency devices drive the need of
 a) Homogeneous and distributed computing architectures
 b) Heterogeneous and parallel computing architectures
 c) Homogeneous and parallel computing architectures
 d) Heterogeneous and distributed computing architectures

Correct Option: d

Detailed Solution: On-premises and edge data centers will continue to close the gap between resource-constrained low-latency devices and distant cloud data centers, leading to driving the need for heterogeneous and distributed computing architectures.

QUESTION 7:

Spatial cloud supports _____ resource pooling which is useful for participating organizations with common goals.
 a) shared
 b) partitioned
 c) stand-alone
 d) None of the above

Correct Answer: a

Detailed Solution: Spatial cloud supports shared resource pooling which is useful for participating organizations with common or shared goals.

QUESTION 8:

The key features of Mobile Cloud Computing (MCC) for 5G networks include

    a. Reliability improvement
    b. Sharing of resources
    c. Offloading data processing
    d. Mitigating network traffic congestion

Correct Answer: a,b,c
Detailed Solution: The key features of Mobile Cloud Computing (MCC) for 5G networks include sharing resources for mobile applications and improved reliability as data is backed up and stored in the cloud. As MCC also offloads data processing from the devices to the cloud, fewer device resources are consumed by applications.

QUESTION 9:

Customized wearable devices for collecting health parameters are the best examples of

    a. IoHT
    b. Fog device
    c. Fog-Cloud interfaced.
    d. Cloud-Fog-Edge-IoHT

Correct Answer: d
Detailed Solution: Customized wearable devices for collecting health parameters are the best examples of Cloud-Fog-Edge-IoHT.

QUESTION 10:

The cyber-physical system involves transdisciplinary approaches, merging the theory of cybernetics, mechatronics, design, and process science.

    a. True
    b. False

Correct Answer: a
Detailed Solution: The cyber-physical system involves transdisciplinary approaches, merging the theory of cybernetics, mechatronics, design, and process science.

Cyber-physical systems (CPS) are essentially smart systems that combine physical components (like sensors and machines) with digital technology (like computers and networks).

QUESTION 2:

Cyber-physical system is all about _____ of the physical and the cyber.

    a. Union
    b. Intersection
    c. Segregation
    d. None of above

Correct Answer: b

Detailed Solution: Cyber-physical system is all about the intersection of the physical and cyber.

QUESTION 4:

The advantage(s) of Cyber-Physical Cloud Computing is(are) as follows

    a. Modular composition
    b. Multi-Tenancy
    c. Data flow
    d. Reliability and resiliency

Correct Answer: a, d

Detailed Solution: The advantages of CyberPhysical Cloud Computing are modular composition and reliable and resilient architecture.

QUESTION 5:

A _____ is a trace generated by a moving object in geographical space, usually represented by a series of chronologically ordered points.

    a. Time series
    b. Road map
    c. Spatial trajectory
    d. Spatial crowdsourcing

Correct Answer: c

Detailed Solution: A spatial trajectory is a trace generated by a moving object in geographical spaces, usually represented by a series of chronologically ordered points.

QUESTION 6:

Limitation(s) of IoT devices is(are)

    a. Containerization
    b. Storage
    c. Processing
    d. Power requirement

Correct Answer: b,c,d

Detailed Solution: The limitations of IoT devices are storage, power requirement, and processing.

QUESTION 7:

Which of the statements is(are) true with respect to Spatial cloud

Statement 1: It does not support shared resource pooling which is useful for participating organizations with common or shared goals

Statement 2: Spatial cloud provides infrastructure requirement that is based on application, with nothing to purchase. This leverages the scalability of the application.

    a. Only statement 1 is true
    b. Only statement 2 is true
    c. Both statements are true
    d. None of the statements is true

Correct Answer: b

Detailed Solution: Spatial cloud provides infrastructure requirement that is based on application, with nothing to purchase. This leverages the scalability of the application. Also, it supports shared resource pooling which is useful for participating organizations with common or shared goals. So, option b is correct.

QUESTION 9:

The cyber-physical system involves transdisciplinary approaches, merging the theory of cybernetics, mechatronics, design, and process science.

    a. True
    b. False

Correct Answer: a

Detailed Solution: The cyber-physical system involves transdisciplinary approaches, merging the theory of cybernetics, mechatronics, design, and process science.

QUESTION 10:

5G network technology has proven to offer a theoretical download speed of 1Gbit/s.

a. True

b. False

Correct Answer: b

Detailed Solution: 5G wireless technology has proven to offer a theoretical download speed of 10Gbit/s.

QUESTION 1:

What is the purpose of 5G wireless technology?

a. Deliver lower data speeds
b. Deliver higher data speeds
c. Decrease network capacity
d. Decrease availability

Answer: b

Detailed Solution: 5G wireless technology is meant to deliver higher multi-Gbps peak data speeds, ultra-low latency, more reliability, massive network capacity, increased availability, and a more uniform user experience to more users.

What is the benefit of 5G's ability to scale down in data rates, power, and mobility for IoT devices?

a. It provides extremely lean and low-cost connectivity solutions
b. It allows for faster data rates and lower latency
c. It enables immersive experiences like VR and AR
d. It provides ultra-reliable, low-latency links for mission-critical communications.

Answer: a

Detailed Solution: 5G is meant to seamlessly connect a massive number of embedded sensors in virtually everything through the ability to scale down in data rates, power, and mobility—providing extremely lean and low-cost connectivity solutions

How are mobile devices connected to mobile networks in Mobile Cloud Computing?

    a. Through cloud storage servers
    b. Through remote access protocols
    c. Through base stations such as base transceiver station, access point, or satellite

---

    d. Through peer-to-peer connections

Answer: c

Detailed Solution: Mobile devices are connected to mobile networks via base stations (e.g., base transceiver station, access point, or satellite).

QUESTION 4:

What drives the need for heterogeneous and distributed computing architectures?

    a. Resource-constrained low-latency devices
    b. Distant cloud data centres
    c. High-speed internet connections
    d. Availability of low-cost computing devices

Answer: a

Detailed Solution: On‑premises and edge data centers will continue to close the gap between resource‑constrained low‑latency devices and distant cloud data centers, leading to driving the need for heterogeneous and distributed computing architectures.

QUESTION 5:

What are the different aspects of CPS?

    a. Cyber, physical, and communication only
    b. Cyber, dynamics, and safety only
    c. Cyber, physical, and computation only
    d. Cyber, physical, computation, dynamics, communication, security, and safety

Answer: d

Detailed Solution: Refer slide 6 of Module 12: Cloud Computing Paradigms; Lecture 57.

Cyber-Physical System (CPS)

- CPS describes a broad range of complex, multi-disciplinary, physically-aware next generation engineered system that integrates embedded computing technologies (cyber part) into the physical world.
- In cyber-physical systems, physical and software components are deeply intertwined, able to operate on different spatial and temporal scales, exhibit multiple and distinct behavioral modalities, and interact with each other in ways that change with context.
- CPS involves transdisciplinary approaches, merging theory of cybernetics, mechatronics, design and process science.
- Cyber + Physical + Computation + Dynamics + Communication + Security + Safety

What is the purpose of spatial analysis?

    a. To study the characteristics of people and their behaviors
    b. To study the characteristics of places and regions and their relationships
    c. To analyze financial data and make investment decisions
    d. To create maps of the physical world

Answer: b

Detailed Solution: Spatial analysis is an attempt to solve location-oriented problems and a better understanding of where and what is occurring in the surrounding world/ region. – Beyond mapping - study the characteristics of places/ regions and the relationships between them.

QUESTION 8:

How is the signal obtained from the accelerometer data for activity detection?

a. By calculating the square root of the x-axis, y-axis, and z-axis signals
b. By averaging the x-axis, y-axis, and z-axis signals
c. By subtracting the x-axis, y-axis, and z-axis signals
d. By multiplying the x-axis, y-axis, and z-axis signals

Answer: a

Detailed Solution: The collected data has three components: x-axis, y-axis, z-axis.
$A = \sqrt{x \cdot x + y \cdot y + z \cdot z}$

QUESTION 9:

According to the given definition, which of the following statement(s) is (are) true about dew computing?

a. Dew computing is a cloud computing paradigm where all computing is done on the cloud without any reliance on on-premises computers.
b. Dew computing is a paradigm where on-premises computers provide functionality that is dependent on cloud services.
c. Dew computing is a paradigm where on-premises computers and cloud services are completely isolated from each other and do not collaborate in any way.
d. Dew computing is a paradigm where on-premises computers provide functionality that is independent of cloud services and is also collaborative with cloud services.

Answer: d

Detailed Solution: According to the definition given, dew computing is a paradigm where on-premises computers provide functionality that is independent of cloud services and is also collaborative with cloud services.

QUESTION 10:

According to the given objectives, which of the following statement(s) is (are) true about the proposed health model?

a. The health model is designed for cloud computing and does not make use of fog or edge computing.
b. The health model is designed for edge computing only and does not make use of cloud or fog computing.
c. The health model is designed for fog-edge computing and aims to reduce latency, network usage and cost incurred in the cloud.
d. The health model is designed for dew computing and does not make use of cloud, fog, or edge computing.

Answer: c

Detailed Solution: According to the given objectives, the health model is designed for fog-edge computing and aims to reduce latency, network usage and cost incurred in the cloud.

QUESTION 1:

Which of the following is not meant to be delivered by the 5G technology?

    a) Higher multi-GPS peak data speed
    b) Massive network capacity
    c) Ultra high latency
    d) Increased availability

Correct Answer: (c)

Detailed Solution: 5G is meant to deliver Ultra low latency.

---

latency = delay / lag

QUESTION 2:

Statement: 5G technology has denser connections than that of in 4G.
    a) True
    b) False

Correct Answer: (a)

Detailed Solution: In 5G, connection density is around 1M/sq. km. whereas it is around 100T/sq. km. in 4G.

QUESTION 3:

Cloud computing services provide a flexible _____ for realizing goals of cyber physical system (CPS).
    a) hardware
    b) software
    c) platform
    d) None of the above

Correct Answer: (c)

Detailed Solution: Cloud computing services provide a flexible platform for realizing goals of CPS.

QUESTION 4:

A Cyber-Physical Cloud Computing (CPCC) architectural framework can be defined as "a system environment that can slowly build, modify and provision cyber-physical systems composed of a set of cloud computing based sensor, processing, control, and data services".

The above statement is
    a) Correct
    b) Wrong

Correct Answer: (b)

Detailed Solution: CPCC is a system environment that can rapidly build, modify and provision cyber-physical systems composed of a set of cloud computing based sensor, processing, control, and data services

QUESTION 6:

Spatial cloud eases out the GIS decision making due to the following reasons:
- a) Integrate the latest databases
- b) Merge disparate systems
- c) Exchange information internally and externally
- d) None of the above

Correct Answer: (a), (b) and (c)
Detailed Solution: All of the first 3 factors are the reasons.

Spatial cloud refers to a cloud computing environment specifically designed to handle spatial data, which includes geographic information system (GIS) data.

QUESTION 7:

Which of the following metrics can be used for evaluating the performance of cloud?
- a) Network usage
- b) Amount of storage space required
- c) Energy consumption
- d) Cost of execution

Correct Answer: a, c, and d
Detailed Solution: Amount of storage space required is not a metrics for evaluating cloud performance

---

QUESTION 8:

In Dew Computing, the on-premises computer provides functionality that is dependent of cloud services.
- a) True
- b) False

Correct Answer: (b)
Detailed Solution: In Dew Computing, the on-premises computer provides functionality that is independent of cloud services.

In Dew Computing, the on-premises computer provides functionality that is independent of cloud services. This means that the on-premises computer can operate and fulfill its functions without relying on continuous or essential connections to cloud services. so thats why independent.

QUESTION 10:

On premise resource utilization is optimum in

    a) Cloud computing
    b) Cloud-Fog-Edge computing
    c) Dew computing
    d) None of the above

Correct Answer: (c)

local device max utilization in dew computing