Introduction to Internet of Things

Assignment-Week 0

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total marks: 10 X 1= 10**

QUESTION 1:

Which of the following allows us to identify objects and extract information?

a. RFID
b. Sensors
c. Actuators
d. IoT Nodes

Correct Answer: a. RFID

Detailed Solution: RFID Technology allows us to automatically identify and track tags that are attached to the objects. It extracts information from the tags through electromagnetic fields.
See lecture 1 @ 12:57

QUESTION 2:

How many layers does Zigbee consist of?

a. 1
b. 2
c. 3
d. 4

Correct Answer: d. 4
Detailed Solution: Zigbee consists of 4 layers: Physical, Medium Access Control, Network, and Application.
See lecture 48 @ 16:11

QUESTION 3:

Which of the following is not a component of cloud computing?

a. Clients
b. Local Servers
c. Services
d. Applications

Correct Answer: b. Local Servers

Detailed Solution: Cloud computing components include clients, services, applications, platform, storage, and infrastructure.
See lecture 37 @ 23:29

QUESTION 4:

Which of the following is a distance measuring sensor module?

a. DHT22
b. HC-SR04
c. TSL2591
d. HC-SR505

Correct Answer: b. HC-SR04

Detailed Solution: HC-SR04 is the distance measuring module ultrasonic sensor, which measures the distance between 2cm~450cm.
See lecture 3 @ 5:00

QUESTION 5:

Which of the following is a component in a typical sensor network?

a. Sink
b. Gateway
c. Router
d. All of these

Correct Answer: d. All of these

Detailed Solution: A typical sensor network comprises of sensor nodes, routers, gateway, and sink.

QUESTION 6:

Which of the following sensors are responsible for measuring orientation and angular velocity?

a. Accelerometer
b. GPS
c. Temperature
d. None of these

Correct Answer: d. None of these

Detailed Solution: A gyroscope is responsible for measuring orientation and angular velocity.

See lecture 59 @ 15:41

QUESTION 7:

"ISA 100.11A" is a wireless networking technology standard. ISA stands for _____.

a. International Society of Automation
b. International Society of Advancement
c. Industrial Society of Automation
d. Industrial Society of Advancement

Correct Answer: a. International Society of Automation

Detailed Solution: ISA100.11a is a wireless networking technology standard developed by the International Society of Automation (ISA).
See lecture 13@ 15:55

QUESTION 8:

Which of the following is not a difference between traditional data center and cloud computing?

a. Scalability
b. Flexibility
c. Elasticity
d. Storage

Correct Answer: d. Storage

Detailed Solution: Major differences between traditional data center and cloud computing include scalability, flexibility, elasticity, automation, running costs, and security
See lecture 39 @ 11:02

QUESTION 9:

Smart grid is also known as the energy internet.

a. True
b. False

Correct Answer: a. True

Detailed Solution: Smart grid is also known as the energy internet.
See lecture 51 @ 7:51

QUESTION 10:

Can a point of node failure result in the partition of the network in the stationary sensor network?

a. Yes

b. No

Correct Answer: a. Yes

Detailed Solution: If there is a failure in the stationary sensor network then it is likely that the point of failure can partition the network into two or more fragments.

See lecture 18 @ 01:10

**************END*************

Introduction to Internet of Things

Assignment-Week 1

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15 **Total marks: 15 X 1= 15**

QUESTION 1:

IoT stands for _____.

a. Internet of Tasks
b. Internet of Tuples
c. Internet of Things
d. None of these

Correct Answer: c. Internet of Things

Detailed Solution: The full form of IoT is "Internet of Things"

See lecture 1 (Introduction to IoT – Part - I) @ 1:30

QUESTION 2:

Which of the following technologies have unified and has resulted in the evolution of IoT?

a. High-power embedded systems
b. Super Computing
c. Engine Technology
d. None of these

Correct Answer: d. None of these

Detailed Solution: Unification of technologies which has resulted in the advancement of IoT are –

a. Low-power embedded systems

b. Cloud Computing

c. Big Data

d. Machine Learning

e. Networking

See lecture 1 (Introduction to IoT – Part - I) @ 5:54

QUESTION 3:

Which of the following are the enables of IoT?

a. RFID
b. Nanotechnology
c. Sensors
d. All of these

Correct Answer: d. All of these

Detailed Solution: The enables of IoT are –

a. RFID

b. Nanotechnology

c. Sensors

d. Smart Networks

See lecture 2 (Introduction to IoT – Part - I) @ 12:50

QUESTION 4:

Which of the following is NOT a function of an IoT LAN?

a. Long range communication, global

b. World wide connections

c. Both (a) and (b)

d. Neither (a) Nor (b)

Correct Answer: c. Both (a) and (b)

Detailed Solution: The functionalities of an IoT Gateway are –

a. Local, short-range communication
b. Spreads across buildings or organization

See lecture 2 (Introduction to IoT – Part - II) @ 3:09

QUESTION 5:

State whether the following statement is True or False.

Statement: The integration of existing devices, smart devices, and constrained nodes in a singular framework is one of the reasons for the address crunch in IoT.

a. True

b. False

Correct Answer: a. True

Detailed Solution: The integration of existing devices, smart devices, and constrained nodes in a singular framework is one of the reasons for the address crunch in IoT.

See lecture 2 (Introduction to IoT – Part - II) @ 02:35

QUESTION 6:

State True or False.

Statement: “In Multi-homing, a node/network is connected to a single network for improved reliability.

a. True
b. False

Correct Answer: b. False

Detailed Solution: In multi-homing, a node/network is connected to multiple networks for improved reliability.

See lecture 2 (Introduction to IoT – Part - II) @ 15:22

QUESTION 7:

Which of the following is/are the approach/approaches for multi-homing?

a. Proxy-based approach
b. Gateway-based approach
c. Both (a) and (b)
d. None of these

Correct Answer: c. Both (a) and (b)

Detailed Solution: The following are the approaches for multi-homing –

1. Proxy-based approach
2. Gateway-based approach

See lecture 2 (Introduction to IoT – Part - II) @ 16:10

QUESTION 8:

IPv6 uses _____ notation for its representation.

a. Hexadecimal
b. Binary
c. Decimal
d. None of these

Correct Answer: a. Hexadecimal

Detailed Solution: IPv6 uses Hexadecimal notation for its representation.

See lecture 2 (Introduction to IoT – Part - II) @ 17:00

QUESTION 9:

State True or False.

The parameters sensed by a sensor may be sent to the cloud for further processing.

a. False
b. True

Correct Answer: b. True

Detailed Solution: The parameters sensed by a sensor may be sent to the cloud for further processing.

See lecture 3 (Sensing) @ 01:15

QUESTION 10:

The IPv6 notation uses _____ number of bits to represent an address.

a. 64
b. 128
c. Both (a) and (b)
d. Neither (a) nor (b)

Correct Answer: b. 128

Detailed Solution: The IPv6 notation uses 128 bits to represent an address.

See lecture 2 (Introduction to IoT – Part - II) @ 16:33

QUESTION 11:

A sensor is -

a. Only sensitive to the measured property
b. Insensitive to any other property that what the sensor is made to sense
c. Both (a) and (b)
d. None of these

Correct Answer: c. Both (a) and (b)

Detailed Solution:

a. Only sensitive to the measured property
b. Insensitive to any other property that what the sensor is made to sense

See lecture 3 (Sensing) @ 12:30

QUESTION 12:

We classify sensors based on -

a. Output
b. Data type
c. Both (a) and (b)
d. None of these

Correct Answer: d. None of these

Detailed Solution:

We classify sensors based on -

a. Output
b. Data type

See lecture 3 (Sensing) @ 13:30

QUESTION 13:

Which of the following is correct statement

a. Controlling AC loads using low DC signals
b. Relays are electromechanical
c. Relays are actuators
d. All of these

Correct Answer: d. All of these

Detailed Solution: All the statements given are correct.

QUESTION 14:

Based on the output, sensors are classified as _____.

a. Analog

b. Digital

c. Both (a) and (b)

d. Neither (a) nor (b)

Correct Answer: c. Both (a) and (b)

Detailed Solution: Based on the output, sensors are classified as Digital and Analog.

See lecture 3 (Sensing) @ 13:05

QUESTION 15:

Soft actuators are -

a. Polymer-based

b. Mechanical

c. Electromechanical

d. None of these

Correct Answer: a. Polymer-based

Detailed Solution: Soft actuators are polymer based.

Lecture 4, @ 15:00

**************END*************

Introduction to Internet of Things

Assignment-Week 2

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **15** **Total marks: 15 X 1= 15**

QUESTION 1:

Based on functionality, MQTT is a _____ protocol.

a. Transport

b. Data

c. Semantic

d. None of these

Correct Answer: b. Data

Detailed Solution: MQTT is a Data Protocol.

See lecture 6 (Basics of IoT Networking – Part II) @ 01:30

QUESTION 2:

MQTT is designed for -

a. Remote connections

b. Limited bandwidth

c. Both (a) and (b)

d. Neither (a) nor (b)

Correct Answer: c. Both (a) and (b)

Detailed Solution: MQTT is designed for –

1. Remote connections

2. Limited bandwidth

See lecture 6 (Basics of IoT Networking – Part II) @ 03:50

QUESTION 3:

State True or False.

MQTT protocol follows _____ paradigm for exchanging messages.

1. Client-Server
2. Publish-Subscribe
3. Both (a) and (b)
4. None of these

See lecture 6 (Basics of IoT Networking – Part II) @ 02:00

QUESTION 4:

State True or False.

Statement: "In MQTT, the Subscribers are Lightweight Sensors."

a. True
b. False

Correct Answer: b. False

Detailed Solution: In MQTT, the Publishers are lightweight sensors.

See lecture 6 (Basics of IoT Networking – Part II) @ 04:49

QUESTION 5:

Which of the following is MQTT component?

a. Middleman
b. Mules
c. Both (a) and (b)
d. None of these

Correct Answer: d. None of these

Detailed Solution:

Components of MQTT are –

1. Publishers
2. Subscribers
3. Beokers

See lecture 6 (Basics of IoT Networking – Part II) @ 04:50

QUESTION 6:

State True or False.

A topic in MQTT can only be numbers.

a. False
b. True

Correct Answer: b. False

Detailed Solution: A topic in MQTT is a string.

Book - Introduction to IoT, Authors – Sudip Misra, Anandarup Mukherjee, and Arijit Roy, Publisher – Cambridge University Press, Edition – 1 (2021)

QUESTION 7:

State True or False.

There are only two methods specified by the MQTT protocol.

a. False
b. True

Correct Answer: a. False

Detailed Solution: There are 5 number of methods in MQTT protocol.

See lecture 6 (Basics of IoT Networking – Part II) @ 05:49

QUESTION 8:

The Publish/Subscribe architecture in MQTT is _____ driven.

a. Event
b. Pulse
c. Sound
d. None of these

Correct Answer: a. Event

Detailed Solution: Publish/Subscribe in MQTT is event-driven and enables messages to be pushed to clients.

See lecture 6 (Basics of IoT Networking – Part II) @ 08:32

QUESTION 9:

State True or False.

The topic is the routing information for the broker.

a. True
b. False

Correct Answer: a. True

Detailed Solution: The topic is the routing information for the broker.

See lecture 6 (Basics of IoT Networking – Part II) @ 08:30

QUESTION 10:

CoAP is _____ and _____.

a. Based on HTTP
b. Is designed for M2M applications
c. None of these
d. Both (a) and (b)

Correct Answer: d. Both (a) and (b)

Detailed Solution: CoAP is based on HTTP and is designed for M2M applications.

See lecture 7 (Basics of IoT Networking – Part III) @ 00:49

QUESTION 11:

In CoAP, client-server interaction is asynchronous over a datagram transport protocol such as _____.

a. UDP
b. TCP
c. IP
d. XMP

Correct Answer: a. UDP

Detailed Solution: In CoAP, client-server interaction is asynchronous over a datagram transport protocol such as UDP.

See lecture 7 (Basics of IoT Networking – Part III) @ 00:50

QUESTION 12:

What is the full form of AMQP?

a. Advanced Message Querying Protocol
b. Advanced Message Quality Protocol
c. Advanced Message Queuing Protocol
d. None of these

Correct Answer: c. Advanced Message Queuing Protocol

Detailed Solution: Advanced Message Queuing Protocol

See lecture 7 (Basics of IoT Networking – Part IV) @ 0:55

QUESTION 13:

AMQP has _____ number of frame types.

a. 6
b. 3
c. 5
d. 9

Correct Answer: d. 9

Detailed Solution: In AMQP there are nine frame types..

See lecture 8 (Basics of IoT Networking – Part IV) @ 07:20

QUESTION 14:

State True or False.

Statement: “The OSI model has 7 layers.”

a. True
b. False

Correct Answer: a. True

Detailed Solution: The OSI model is a conceptual framework that divides any networked communication system into seven layers.

See Page number – 10, Chapter - 1, Book - Introduction to IoT, Authors – Sudip Misra, Anandarup Mukherjee, and Arijit Roy, Publisher – Cambridge University Press, Edition – 1 (2021)

QUESTION 15:

The "Destination Address" in the IPv4 packet represents which of the following?

a. The source node address of the packet
b. The intermediate hop in the network
c. Both (a) and (b)
d. Neither (a) nor (b)

Correct Answer: d. Neither (a) nor (b)

Detailed Solution: The "Destination Address" in the IPv4 packet represents the address of the destination node in the network.

See Page number – 18, Chapter - 1, Book - Introduction to IoT, Authors – Sudip Misra, Anandarup Mukherjee, and Arijit Roy, Publisher – Cambridge University Press, Edition – 1 (2021)

**************END*************

Introduction to Internet of Things

Assignment-Week 3

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15 **Total marks: 15 X 1= 15**

QUESTION 1:

State True or False.

Statement: "WirelessHART is the latest release of Highway Addressable Remote Transducer protocol."

a. True
b. False

Correct Answer: a. True

Detailed Solution: WirelessHART is the latest release of Highway Addressable Remote Transducer protocol.

See lecture 11 (Connectivity Technologies-III) @ 01:42

QUESTION 2:

State True or False.

Statement: "Wired HART has a network layer."

a. True
b. False

Correct Answer: b. False

Detailed Solution: Wired HART does not have a network layer.

See lecture 11 (Connectivity Technologies-III) @ 04:25

QUESTION 3:

State true or false:

"WirelessHART physical layer is derived from 802.15.2 protocol"

a. False
b. True

Correct Answer: a. False

Detailed Solution: WirelessHART physical layer is derived from 802.15.4 protocol.

See lecture 11 (Connectivity Technologies-III) @ 06:00

QUESTION 4:

WirelessHART operates only in _____ GHz ISM band.

a. 3.7
b. 4.8
c. 4.8
d. 2.4

Correct Answer: d. 2.4

Detailed Solution: HART operates only in the 2.4 GHz ISM band.

See lecture 11 (Connectivity Technologies-III) @ 06:00

QUESTION 5:

HART standard was developed from _____ smart field devices.

a. amplified
b. diminished
c. isolated
d. networked

Correct Answer: d. networked

Detailed Solution: HART standard was developed for networked smart field devices.

See lecture 11 (Connectivity Technologies-III) @ 02:36

QUESTION 6:

Main difference between wired and unwired versions is in the physical, data link, and _____ layers.

a. Data link
b. Network
c. Transport
d. None of these

Correct Answer: b. Network

Detailed Solution: Main difference between wired and unwired versions is in the physical, data link, and network layers.

See lecture 11 (Connectivity Technologies-III) @ 05:05

QUESTION 7:

State true or false

"Collision free and deterministic communication is achieved in HART's data link layer."

a. True
b. False

Correct Answer: a. True

Detailed Solution: Collision free and deterministic communication is achieved in HART's data link layer.

See lecture 11 (Connectivity Technologies-III) @ 06:37

QUESTION 8:

Channel hopping is incorporated in which layer of HART?

a. Data link layer
b. Physical layer
c. Application layer
d. Transport layer

Correct Answer: a. Data link layer

Detailed Solution: Channel hopping is incorporated in the data link layer of HART.

See lecture 11 (Connectivity Technologies-III) @ 08:21

QUESTION 9:

State True or False.

"The HART application layer is responsible for extracting commands from a message, executing it and generating responses."

a. True
b. False

Correct Answer: a. True

Detailed Solution: The HART application layer is responsible for extracting commands from a message, executing it and generating responses.

See lecture 11 (Connectivity Technologies-III) @ 10:26

QUESTION 10:

NFC is designed for use by devices within _____ to each other.

a. Anywhere on the globe
b. A small building
c. Both (a) and (b)
d. None of these

Correct Answer: d. None of these

Detailed Solution: NFC is designed for use by devices within close proximity to each other.

See lecture 11 (Connectivity Technologies-III) @ 17:47

QUESTION 11:

Passive NFC devices _____ information which is _____ by other devices.

a. contain, read
b. read, contain
c. contain, contain
d. None of these

Correct Answer: a. contain, read

Detailed Solution: Passive NFC devices contain information which is read by other devices.

See lecture 11 (Connectivity Technologies-III) @ 18:34

QUESTION 12:

State True or False.

"NFC devices work on the principle of magnetic induction."

a. True
b. False

Correct Answer: a. True

Detailed Solution: NFC devices work on the principle of magnetic induction.

See lecture 11 (Connectivity Technologies-III) @ 21:47

QUESTION 13:

Bluetooth technology is based on _____.

a. HART
b. ZigBee
c. All of these
d. None of these

Correct Answer: d. None of these

Detailed Solution: Bluetooth technology is based on Ad-hoc piconets.

See lecture 12 (Connectivity Technologies-IV) @ 02:30

QUESTION 14:

State whether the following statement is true or false.

Statement: The Link Manager Protocol in Bluetooth manages the only establishment and authentication.

a. True
b. False

Correct Answer: b. False

Detailed Solution: The Link Manager Protocol in Bluetooth manages the establishment, authentication, link configuration.

See Page number – 157, Chapter - 7, Book - Introduction to IoT, Authors – Sudip Misra, Anandarup Mukherjee, and Arijit Roy, Publisher – Cambridge University Press, Edition – 1 (2021)

QUESTION 15:

Zigbee commonly uses _____data rate.

a. 260 bps
b. 260 kbps
c. 260 Mbps
d. None of these

Correct Answer: d. None of these

Detailed Solution: Zigbee commonly uses a 250-kbps data rate.

See Page number – 131, Chapter - 7, Book - Introduction to IoT, Authors – Sudip Misra, Anandarup Mukherjee, and Arijit Roy, Publisher – Cambridge University Press, Edition – 1 (2021)

**********END**********

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Introduction to Internet of Things

Assignment-Week 4

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15 **Total marks: 15 X 1= 15**

QUESTION 1:

State whether the following statement is true or false.

Statement: In "AID", a set of sensor nodes are deployed over an agricultural field.

a. True
b. False

Correct Answer: a. True

Detailed Solution: In "AID", a set of sensor nodes are deployed over a agricultural field

See lecture 16 (Sensor Networks-III) @ 13:16

QUESTION 2:

State True or False.

Statement: Ultrasonic sensor senses the distance at which an object is located.

a. True
b. False

Correct Answer: a. True

Detailed Solution: Ultrasonic sensor senses the distance at which an object is located.

See lecture 16 (Sensor Networks-III) @ 13:18

QUESTION 3:

State true or false.

In case of static sensors, where to deploy and/or activate sensors in WSN is a coverage problem.

a. True
b. False

Correct Answer: a. True

Detailed Solution: In case of static sensors, where to deploy and/or activate sensors in WSN is a coverage problem.

See lecture 17 (Sensor Networks-IV) @ 07:11

QUESTION 4:

State whether the following statement is true or false.

Statement: Objective of coverage in WSN is to use maximum number of sensors and minimize network lifetime.

a. True
b. False

Correct Answer: b. False

Detailed Solution: The objective of coverage in WSN is to use minimum number of sensors and maximize the network lifetime.

See lecture 17 (Sensor Networks-IV) @ 08:47

QUESTION 5:

State whether the following statement is true or false.

Statement: “A crossing is covered if it is in the interior of at least one node’s coverage disk.”

a. True

b. False

Correct Answer: a. True

Detailed Solution: A crossing is covered if it is in the interior of at least one node's coverage disk.

See lecture 17 (Sensor Networks-IV) @ 18:58

QUESTION 6:

State which of the following is/are correct for stationary wireless sensor networks.

a. Topology cannot be changed automatically.
b. Node failure may result in partition of networks.
c. Both (a) and (b)
d. None of these

Correct Answer: c. Both (a) and (b)

Detailed Solution: Topology cannot be changed automatically. And Node failure may result in partition of networks. Are correct.

See lecture 18 (Sensor Networks-V) @ 00:43

QUESTION 7:

Most problems in static WSN can be classified as -

a. No coverage
b. More coverage
c. Both (a) and (b)
d. None of these

Correct Answer: d. None of these

Detailed Solution: Most problems in static WSN can be classified as -

a. Area coverage

b. Point coverage

c. Barrier coverage

See lecture 18 (Sensor Networks-V) @ 11:30

QUESTION 8:

Which of the following is/are correct with respect UAV networks?

a. Multi-tasking
b. Large coverage area
c. Both (a) and (b)
d. None of these

Correct Answer: c. Both (a) and (b)

Detailed Solution: Multi-tasking and Large coverage area are correct.

See lecture 19 (Sensor Networks-V) @ 05:19

QUESTION 9:

State True or False.

Statement: UAV networks are scalable.

a. True
b. False

Correct Answer: a. True

Detailed Solution: UAV networks are scalable.

See lecture 19 (UAV Networks-V) @ 09:00

QUESTION 10:

In Mobile WSN, the Data Mules

a. Collect the data from sensor nodes
b. Goes to the sink and delivers the collected data
c. Both (a) and (b)
d. Neither (a) nor (b)

Correct Answer: c. Both (a) and (b)

Detailed Solution: In Mobile WSN, the Data Mules

a. Collect the data from sensor nodes
b. Goes to the sink and delivers the collected data

See lecture 18 (Sensor Networks-V) @ 07:15

QUESTION 11:

The full form of AUV is -

a. Antenna Used Vehicle
b. Autonomous Underwater Vehicle
c. Both (a) and (b)
d. Neither (a) nor (b)

Correct Answer: b. Autonomous Underwater Vehicle (AUV)

Detailed Solution: Autonomous Underwater Vehicle (AUV)

See lecture 18 (Sensor Networks-V) @ 08:35

QUESTION 12:

Humans carry their devices and move around. Sensors embedded within the devices record readings. Sensory readings are then transmitted for processing.

This paradigm of sensing is known as –

a. Machine Centric Sensing
b. Device Centric Sensing
c. Human Centric Sensing
d. None of these

Correct Answer: c. Human Centric Sensing

Detailed Solution: Humans carry their devices and move around. Sensors embedded within the devices record readings. Sensory readings are then transmitted for processing.
This paradigm of sensing is known as Human Centric Sensing.

See lecture 18 (Sensor Networks-V) @ 11:37

QUESTION 13:

State True or False.

Energy of Devices and Participant selection are not two major problems in Human Centric Sensing.

a. True
b. False

Correct Answer: b. False

Detailed Solution: Energy of Devices and Participant selection are not two major problems in Human Centric Sensing.

See lecture 18 (Sensor Networks-V) @ 12:45

QUESTION 14:

Which of the following network topologies is used in UAV networks?

a. Bus
b. Star
c. Both (a) and (b)
d. Neither (a) nor (b)

Correct Answer: b. Star

Detailed Solution: UAV networks use the mesh and star network topologies.

See lecture 19 (UAV Networks) @ 02:43

QUESTION 15:

State true of false.

The M2M Application Platform provides integrated services based on device collected data-sets.

a. True
b. False

Correct Answer: a. True

Detailed Solution: The M2M Application Platform provides integrated services based on device collected data-sets.

See lecture 20 (Machine to Machine Communication) @ 18:00

**************END*************

Introduction to Internet of Things

Assignment-Week 5

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15 **Total marks: 15 X 1= 15**

QUESTION 1:

Which of the following is/are current challenges in IoT?

a. Large scale of co-operation

b. Global heterogeneity

c. Both (a) and (b)

d. Neither (a) nor (b)

Correct Answer: c. Both (a) and (b)

Detailed Solution: Large scale of co-operation and Global heterogeneity are current challenges in IoT.

See lecture 21 (Interoperability in Internet of Things) @ 03:41.

QUESTION 2:

State True or False.

Statement: “Interoperability is not a characteristic of a product or system.”

a. True

b. False

Correct Answer: b. False

Detailed Solution: Interoperability is a characteristic of a product or system.

Refer Lecture 21@5:51

QUESTION 3:

Interoperability is required because

a. There are different programming languages

b. There are different communication protocols

c. Both (a) and (b)

d. Neither (a) nor (b)

Correct Answer: c. Both (a) and (b)

Detailed Solution: Interoperability is required because

a) There are different programming languages

b) There are different communication protocols

Refer Lecture 21@08:30

QUESTION 4:

State whether the following statement is true or false

Statement: “Use of different programming languages such as JavaScript, Python, JAVA, and others is an example of heterogeneity in IoT. This brings in the need for interoperability.”

a. False

b. True

Correct Answer: b. True

Detailed Solution: Use of different programming languages such as JavaScript, Python, JAVA, and others is an example of heterogeneity in IoT. This brings in the need for interoperability

(Please refer Lecture 21@09:12)

QUESTION 5:

State True or False.

Statement: "The interoperability between devices and device users in terms of message formats is called Systematic Interoperability."

a. True

b. False

Correct Answer: b. False

Detailed Solution: The interoperability between devices and device users in terms of message formats is called Syntactic Interoperability.

Refer Lecture 21@17:06.

QUESTION 6:

What is the full form of UMB in IoT interoperability?

a. Universal Meta Bridge

b. Universal Main Bridge

c. Universal Main Bracket

d. None of these

Correct Answer: d. None of these

Detailed Solution: UMB stands for Universal Middleware Bridge.

Refer Lecture 21@22:16.

QUESTION 7:

State true of false

Arduino is an open-source electronic programmable board.

a. True

b. False

Correct Answer: a. True

Detailed Solution: Arduino is an open-source electronic programmable board.

Refer Lecture 22@05:17

QUESTION 8:

State true or false

Additional electronic circuits are essential to load a program into the Arduino controller board.

a. True

b. False

Correct Answer: b. False

Detailed Solution: No additional electronic circuits are essential to load a program into the Arduino controller board.

Refer Lecture 22@05:17.

QUESTION 9:

Arduino UNO has _____ number of Digital I/O pins.

a. 8

b. 13

c. 14

d. None of these

Correct Answer: c. 14

Detailed Solution: Arduino UNO has 14 number of Digital I/O pins.

Refer Lecture 22@07:08.

QUESTION 10:

What does the following code do?

```
int ledPin = 13;
void setup() {
pinMode(ledPin, OUTPUT);
for (int i = 0; i < 3; i++) {
digitalWrite(ledPin, HIGH);
delay(1000);
digitalWrite(ledPin, LOW);
delay(500);
}
}
void loop() {
// Do nothing
```

}

a) Blink 3 times with 1000ms ON and 500ms OFF

b) Blink 3 times with 500ms ON and 500ms OFF

c) Blink 3 times with 1000ms ON and 1000ms OFF

d) Stay ON continuously

Correct Answer: a) Blink 3 times with 1000ms ON and 500ms OFF

Detailed Solution:

The LED is turned ON for 1000ms using delay(1000).

The LED is turned OFF for 500ms using delay(500).

This process repeats 3 times in the for loop.

Thus, the LED blinks 3 times with 1000ms ON and 500ms OFF.

QUESTION 11:

How many types of loops will you find in Arduino Programming?

a. 1

b. 2

c. 3

d. 4

Correct Answer: c. 3

Detailed Solution: Like C programming Arduino sketches also have 3 types of loops, for, while and do-while loops.

QUESTION 12:

Choose the right option for if/conditional operator.

a. Val = (condition)?(Statement 1):(Statement 2)

b. Val = (condition)?(Statement 2):(Statement 1)

c. Val = (condition):(Statement 1)?(Statement 2)

d. Val = (condition):(Statement 2)?(Statement 1)

Correct Answer: a. Val = (condition)?(Statement 1):(Statement 2)

Detailed Solution: Conditional operator may also be written as Val = (condition)?(Statement 1):(Statement 2). (Please refer Lecture 23@2:01)

QUESTION 13:

What is the purpose of calling dht.begin(); in the setup() function?

A) To initialize the Serial Monitor

B) To start communication with the DHT sensor

C) To set the temperature and humidity values to zero

D) To define the data pin for the sensor

Correct Answer: B) To start communication with the DHT sensor

Detailed Solution: Calling dht.begin(); in the setup() function starts communication with the DHT sensor.

Refer Lecture 24@ 17:25.

QUESTION 14:

What function is used to read the humidity value from the DHT sensor?

A) dht.getHumidity();

B) dht.readTemp();

C) dht.readHumidity();

D) dht.getTemperature();

Correct Answer: c. dht.readHumidity();

Detailed Solution: dht.readHumidity(); function is used to read the humidity value from the DHT sensor Lecture 24@17:25.

QUESTION 15:

What function is used to set the servo motor to a specific angle?

A) ServoDemo.move()

B) ServoDemo.rotate()

C) ServoDemo.write()

D) ServoDemo.setAngle()

Correct Answer: c. ServoDemo.write()

Detailed Solution: ServoDemo.write() function is used to set the servo motor to a specific angle.

Refer Lecture 25@18:47.

**************END*************

Introduction to Internet of Things

Assignment-Week 6

TYPE OF QUESTION:MCQ/MSQ

Number of questions:15 **Total marks: 15 X 1= 15**

QUESTION 1:

State True or False.

Statement: "Python is popular for embedded application development as it is a very lightweight programming language."

a. True

b. False

Correct Answer: a. True

Detailed Solution: Python is popular for embedded application development as it is a very lightweight programming language.

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 1:22)

QUESTION 2:

State True or False.

Adafruit provides a library to work with DHT22 Sensor.

a. True

b. False

Correct Answer: a. True

Detailed Solution: Adafruit provides a library to work with DHT22 Sensor. (Please refer to lecture Implementation of IoT with Raspberry Pi- II @ 4:41)

QUESTION 3:

Consider the following piece of Python code. What is the output?

```
x = [4, 5, 6]
y = [str(x[0] + 1), str(len(x) * 2) + '&Code']
z = y[1].split('&')
print(z[1])
```

a) 5

b) 12

c) Code

d) &Code

Correct Answer: c. Code

Detailed Solution:

1. x = [4, 5, 6]: A list with three elements.

2. y = [str(x[0] + 1), str(len(x) * 2) + '&Code']:

    o x[0] is 4, so x[0] + 1 is 5, and str(x[0] + 1) becomes "5".

o len(x) is 3, so len(x) * 2 is 6, and str(len(x) * 2) + '&Code' becomes "6&Code".

o Therefore, y = ["5", "6&Code"].

3. z = y[1].split('&'):

o y[1] is "6&Code".

o Splitting "6&Code" by '&' gives ['6', 'Code'].

4. z[1] is 'Code'.

Thus, the print(z[1]) statement outputs Code.

QUESTION 4:

State True or False.

Statement: “To indicate different blocks of code, Python follows rigid indentation.”

a. True

b. False

Correct Answer: a. True

Detailed Solution: To indicate different blocks of code, Python follows rigid indentation.

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 7::29).

QUESTION 5:

What is the output of the following line of code in Python?

>>> print “Hi, Welcome to python!”

a. Hi, Welcome to python!

b. "Hi, Welcome to python!"

c. Hi, Welcome to python

d. None of these

Correct Answer: a. Hi, Welcome to python!

Detailed Solution: The output of the following line of code in Python -

>>> print "Hi, Welcome to python!"

Output: Hi, Welcome to python!

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @ 07:31)

QUESTION 6:

During remote server access by a Raspberry Pi, where the Raspberry Pi acts as a client, the client needs the following?

a. Only IP address of server

b. Only port number

c. Both server IP address and port number

d. Client's IP address

Correct Answer: c. Both server IP address and port number

Detailed Solution: A client can communicate with a server only if both IP address and port numbers are known. (Please refer Lecture 31@14:13)

QUESTION 7:

State whether the following command to install the PIL library is correct or not.

sudo pip install pillow

a. Correct

b. Incorrect

Correct Answer: a. Correct

Detailed Solution: The command to install the PIL library is *sudo pip install pillow*.

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @ 17:40)

QUESTION 8:

What is the purpose of the `"w"` mode in the `open()` function in Python?

A) To read a file
B) To write data to a file, overwriting existing content
C) To append data to a file
D) To open a file in read and write mode

Correct Answer: B) To write data to a file, overwriting existing content

Detailed Solution: "w" mode is used to write data to a file, overwriting existing content

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @05:05).

QUESTION 9:

What will be the output of the given Python program when reading from the file?

```
with open("PythonProgram.txt", "w") as file:
    file.write("Writing data")
with open("PythonProgram.txt", "r") as file:
    f = file.read() print('Reading from the file\n') print(f)
```

A) Writing data
B) Reading from the file
Writing data
C) Error: File not found
D) None of the above

Correct Answer: B. Reading from the file

Writing data

Detailed Solution: Reading from the file

Writing data

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING-II @05:05).

QUESTION 10:

Can we configure Raspberry Pi as a File Server?

a. Yes
b. No

Correct Answer: a. Yes

Detailed Solution: We can configure Raspberry Pi as a File Server.

See lecture INTRODUCTION TO RASPBERRY PI-I @ 02:46

QUESTION 11:

Which command is used to configure the Raspberry Pi for the camera module?

A) `sudo camera-config`
B) `sudo raspi-config`
C) `sudo enable-camera`
D) `sudo pi-setup`

Correct Answer: B) `sudo raspi-config`

Detailed Solution: `sudo raspi-config` is used to configure the Raspberry Pi for the camera module

See lecture INTRODUCTION TO RASPBERRY PI-II @ 18:44

QUESTION 12:

What is the final step after enabling the camera in the Raspberry Pi configuration?

A) Restart the camera service
B) Run a camera test command
C) Reboot the Raspberry Pi
D) Reinstall the Raspberry Pi OS

Correct Answer: C) Reboot the Raspberry Pi

Detailed Solution: after enabling the camera in the Raspberry Pi configuration, reboot.

See lecture IMPLEMENTATION OF IOT WITH RASPBERRY PI-II @ 18:44

QUESTION 13:

Which command Exits the nano editor?

a. Ctrl + X
b. Ctrl + O
c. Ctrl + K
d. None of these

Correct Answer: a. Ctrl + X

Detailed Solution: Ctrl + O exits the nano editor.

See lecture IMPLEMENTATION OF IOT WITH RASPBERRY PI-II @ 10:20

QUESTION 14:

In a temperature-controlled fan system using a relay, when should the fan turn on?

A) When the relay is manually triggered
B) When the surrounding temperature is lower than a predefined threshold
C) When the surrounding temperature exceeds a predefined threshold
D) When the battery voltage drops below a certain level

Correct Answer: C) When the surrounding temperature exceeds a predefined threshold

Detailed Solution: In a temperature-controlled fan system using a relay, the fand should turn on when the surrounding temperature exceeds a predefined threshold.

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @ 11:18)

QUESTION 15:

What does the following line of code do?

raspistillcapture -o image.jpg

a. Captures video feed
b. Captures still image
c. Both (a) and (b)
d. None of these

Correct Answer: d. None of these

Detailed Solution: Command is wrong.

(Please refer to lecture INTRODUCTION TO RASPBERYY PI-II @ 19:29)

**************END*************

Introduction to Internet of Things

Assignment-Week 7

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15 **Total marks: 15 X 1= 15**

QUESTION 1:

In Python socket programming, while defining a socket, SOCK_STREAM refers to a type of

a. SocketFamily

b. SocketType

c. SocketName

d. SocketProtocol

Correct Answer: b. SOCK_STREAM refers to a type of SocketType, i.e either TCP socket or UDP socket.

Detailed Solution: Refer Lecture 31@6:27

QUESTION 2:

If you want to change the label of the Y-axis while plotting a graph using matplotlib in Python, what among the following functions do you use? Suppose you have imported matplotlib as plt

a. plt.show()

b. plt.plot()

c. plt.ylabel()

d. plt.yaxis()

Correct Answer: c. plt.ylabel()

Detailed Solution: Refer Lecture 32@12:39.

QUESTION 3:

In Socket programming, the parameter AF_INET stands for _____.

a. Unix protocols

b. Internet Protocol (IP)

c. File sharing

d. Time slicing

Correct Answer: b. Internet Protocol (IP)

Detailed Solution The AF_INET specifies the rules and standards of the Internet protocol, hence the socket acts as an IP socket. (Please refer Lecture 31@14:13)

QUESTION 4:

Suppose a Python server is receiving data from a socket as follows,

```
data, addr = sock.recvfrom(1024)
```

What kind of socket 'sock' is being considered here.

a. TCP socket

b. UDP socket

c. TAP socket

d. None of the given

Correct Answer: b. UDP socket

Detailed Solution: sock.recvfrom() is the form used to receive data from UDP sockets. Refer to any standard socket programming documentations.

QUESTION 5:

What is the use of the Mobi-Flow protocol?

a. Enabling static SDN
b. Enabling SDN to incorporate mobility
c. Enabling Odin Master
d. Enabling traditional BGP

Correct Answer: b. Enabling SDN to incorporate mobility

Detailed Solution: Refer Lecture 34@14:41.

QUESTION 6:

During remote server access using socket programming what is the utility of the <socket_name>.listen() function?

a. To create a new socket
b. To bind the socket to connection
c. To wait for clients to connect
d. To close the connection

Correct Answer: c. To wait for clients to connect

Detailed Solution: listen() function makes the server wait for incoming client connections (Refer Lecture 31 ppt no 13)

QUESTION 7:

Which among the following is the correct direction for PACKET_OUT type messages in SDN?

a. From controller to switch

b. From switch to controller

c. Between two switches

d. Between two controllers

Correct Answer: a. From controller to switch

Detailed Solution: PACKET_OUT messages are sent from switches to the controller upon receipt of new unknown packets. Refer lecture 33, ppt no 20.

QUESTION 8:

Which among the following is a limitation of the traditional non-SDN networks?

a. Switches do not possess routing table

b. Switches are unable to forward traffic

c. Switches do not have a global view of the network.

d. All of the given

Correct Answer: c. Switches do not have a global view of the network.

Detailed Solution: Refer Lecture 33@6:53.

QUESTION 9:

During remote server access by a Raspberry Pi, where the Raspberry Pi acts as a client, the client needs the following?

a. Only IP address of server

b. Only port number

c. Both server IP address and port number

d. Client's IP address

Correct Answer: c. Both server IP address and port number

Detailed Solution: A client can communicate with a server only if both IP address and port numbers are known. (Please refer Lecture 31@14:13)

QUESTION 10:

With respect to the concept of soft time-out and hard time-out in SDN switches, which of the following relations hold?

a. Soft time-out > = hard time-out

b. Hard time-out >= soft time-out

c. Soft time-out = hard time-out always

d. None of the given

Correct Answer: b. Hard time-out >= soft time-out

Detailed Solution: Hard time-outs of flow rules are always greater than soft time-outs, not the other way round. Refer lecture 33, OpenFlow Protocol III

QUESTION 11:

Which of the following is true?

a. Traditional Network: Routing Table, Software Defined Network: Routing Table

b. Traditional Network: Flow Table, Software Defined Network: Routing Table

c. Traditional Network: Routing Table, Software Defined Network: Flow Table

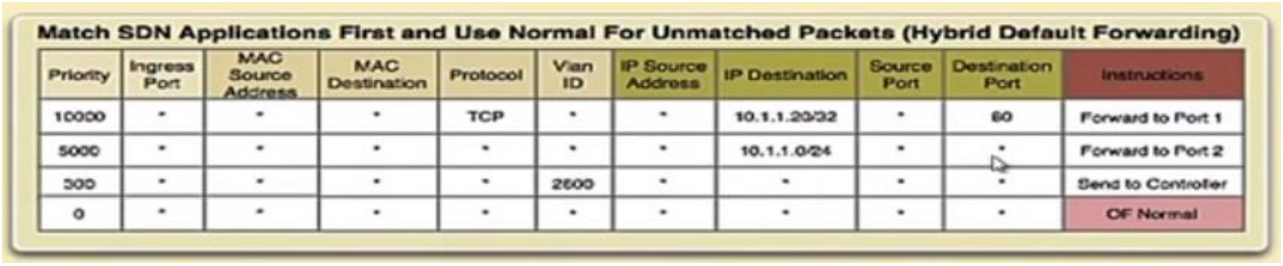
d. Traditional Network: Flow Table, Software Defined Network: Flow Table

Correct Answer: c. Traditional Network: Routing Table, Software Defined Network: Flow Table

Detailed Solution: All switches in traditional network have routing tables and those in Software Defined Network have flow tables (Please refer Lecture 33@17:15)

QUESTION 12:

Consider the following figure below. To which issue of SDN does this particular figure can be related to?



a. Controller placement issue

b. Flow Rule placement issue

c. Hardware placement issue

d. Analysis placement issue

Correct Answer: b. Flow Rule placement issue

Detailed Solution: The given figures shows the tabular structure of how flow rules are installed within

SDN switches, so it pertains to flow rule placement issues. Refer Lecture 33@18:54, Rule Placement.

QUESTION 13:

With respect to the directional APIs in SDN, what is the functionality of East-Westbound APIs?

a. To communicate between the controller and switches

b. To communicate among multiple controllers

c. East-Westbound APIs do not exist

d. To communicate between switches themselves.

Correct Answer: b. To communicate among multiple controllers.

Detailed Solution: Refer Lecture 34@2:10.

QUESTION 14:

Hierarchical SDN architecture is also known as _____ architecture.

a. Tree

b. Flat

c. Mesh

d. Line

Correct Answer: a. Tree

Detailed Solution: Refer Lecture 34@6:12

QUESTION 15:

Integrating SDN with IoT is not recommended and is not a suitable approach to follow

a. False

b. True

Correct Answer: a. False

Detailed Solution: SDN integration with IoT is highly recommended for efficient delivery of services. Refer Lecture 35.

**********END**********

Introduction to Internet of Things

Assignment-Week 8

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15 **Total marks: 15 X 1= 15**

QUESTION 1:

What is Sensor Openflow?

a. A traditional routing protocol

b. A queue management protocol

c. An SDN protocol tailored for IoT devices

d. A physical connectivity protocol.

Correct Answer: c. An SDN protocol tailored for IoT devices.

Detailed Solution: Refer Lecture 36@1:38

QUESTION 2:

With respect to Mobi-Flow, how does Mobi-Flow fare in comparison to Conventional networking in terms of message overhead?

a. Mobi-Flow > Conventional

b. Mobi-Flow < Conventional

c. Mobi-Flow = Conventional

d. None of the given

Correct Answer: b. Mobi-Flow < Conventional

Detailed Solution: Refer Lecture 36@16:08.

QUESTION 3:

Virtual Machines came before Cloud Computing.

a. True
b. False

Correct Answer: a. True

Detailed Solution Virtual Machines came before Cloud Computing. Refer Lecture 37@8:00

QUESTION 4:

Private cloud services cannot provide Software-as-a-Service (SaaS).

a. True
b. False

Correct Answer: b. False

Detailed Solution: Any cloud deployment model can provide any cloud service model. Refer Lecture 37@14:36.

QUESTION 5:

Which among the following is a solution for mobility-aware flow rule placement in SDIoT?

a. Mobility-Flow
b. Mobile-Flow
c. Mobi-Flow
d. M-Flow

Correct Answer: c. Mobi-Flow

Detailed Answer: Mobi-Flow has been proposed to provide a solution for mobility-aware flow rule placement. Refer Lecture 36@13:09 onwards

---

QUESTION 6:

An organization A wants to deploy a cloud infrastructure, whereby it wants to push majority of the data to a cloud whose servers can be situated anywhere within the globe, but it wants certain private data to be pushed only to cloud servers that are present on-premise and are accessible by only authenticated members of the organization. In this context which among the following deployment model should be used?

a. Private Cloud
b. Public Cloud
c. Hybrid Cloud
d. Any of these

Correct Answer: c. Hybrid Cloud

Detailed Solution: Hybrid cloud deployment model supports both the features of public and private cloud. Refer lecture 37, ppt No. 18.

QUESTION 7:

Which among the following is the most on-premise cloud deployment model?

a. Private Cloud
b. Public cloud

c. IaaS

d. PaaS

Correct Answer: a. Private Cloud

Detailed Solution: Refer Lecture 37@33:31.

QUESTION 8:

Which of the following type of client requires constant communication/connection with the cloud server?

a. Thin client

b. Thick client

c. Both thin and thick clients

d. None of these

Correct Answer: **a. Thin client**

Detailed Answer: A thin client is a network computer without a hard disk drive and high configurations. They act as simple terminals and require constant communication with the servers.

(Please refer Lecture 37@20:00)

QUESTION 9:

What does 'CIA' in cloud data security stand for?

a. Confidentiality, Integrity, Availability

b. Confidentiality, Inheritance, Automation

c. Congestion, Integrity, Authentication

d. Criticality, Integrity, Accountability

Correct Answer: a. Confidentiality, Integrity, Availability

Detailed Solution: 'CIA' stands for 'Confidentiality, Integrity and Availability'. (Please refer Lecture 39@21:01)

QUESTION 10:

When you are accessing Spotify online for listening to music from your browser without specifically installing them, which among the following cloud service models is the most appropriate one that you are using.

a. SaaS

b. PaaS

c. IaaS

d. DaaS

Correct Answer: a. SaaS

Detailed Solution: This is an example of SaaS, since you are accessing a word/document processing software as a client over the network. The actual software itself runs on some remote cloud server (Please refer Lecture 37@26:14 AND 38@13:16)

QUESTION 11:

With respect to Cloud Computing security, which of the following are necessary

a. Network Level Security but not Host Level Security

b. Application Level Security but not Host Level Security

c. Host Level Security but not Network Level Security

d. All of Network, Host and Application Level Security.

Correct Answer: d. All of Network, Host and Application Level Security

Detailed Solution: Refer Lecture 39 Cloud Security.

QUESTION 12:

Data security and client authentication is an issue in which of the following cloud service models?

a. SaaS

b. SaaS and PaaS

c. IaaS

d. All of them

Correct Answer: d. All of them

Detailed Solution: Security is a pertinent issue in all of the cloud service models, which includes SaaS, PaaS and IaaS. Refer to any standard discussion on challenges and issues on cloud computing and Lecture 39.

QUESTION 13:

What is the role of a Hypervisor (most probable answer)?

a. To facilitate installation of a router

b. To provide a platform for executing virtual machines

c. To facilitate sensor fabrication

d. To communicate between switches themselves.

Correct Answer: b. To provide a platform for executing virtual machines.

Detailed Solution: Refer Lecture 38@5:40.

QUESTION 14:

Which of the following is a limitation of SaaS?

a. Remote software execution

b. Platform independence

c. Centralized control

d. None of these.

Correct Answer: c. Centralized control

Detailed Solution: Refer Lecture 38@15:58.

QUESTION 15:

Fill in the blank.

_____ means independent of device or location.

a. Scalable

b. Reliability

c. Agile

d. Ubiquitous

Correct Answer: d. Ubiquitous

Detailed Solution: Ubiquitous means independent of device or location.

(Please refer Lecture 37@18:06)

**********END**********

Introduction to Internet of Things

Assignment-Week 9

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15 **Total marks: 15 X 1= 15**

QUESTION 1:

Which of the following is/are the advantages of cloud computing?

a. Elasticity

b. Pay-per-use

c. Self Service

d. All of the above

Correct Answer: d. All of the above

Detailed Solution: The advantages of cloud computing include Elasticity, Pay-per-use and Self-Service. (Please refer Lecture 42@6:45)

QUESTION 2:

Fill in the blanks. Fog computing is an intermediate layer between _____ and _____.

a. Dew and devices

b. Cloud and devices

c. Cloud and server

d. None of these

Correct Answer: b. Cloud and devices

Detailed Solution: Fog computing is an intermediate layer between Cloud and devices. (Please refer Lecture 44@6:40)

QUESTION 3:

The managerial role is played by _____ in sensor-cloud architecture.

a. End-users

b. Sensor-Cloud Service Provider

c. Neither a nor b

d. Both a and b

Correct Answer: b. Sensor-Cloud Service Provider

Detailed Solution: Sensor-Cloud Service Provider plays the managerial role in sensor-cloud architecture. (Please refer Lecture 42@14:29)

QUESTION 4:

Which of the following is not a component of OpenStack?

a. Suse

b. Nova

c. Swift

d. All of these

Correct Answer: a. Suse

Detailed Solution: Nova and Swift are two of the many components of OpenStack

(Please refer Lecture 41@3:18)

QUESTION 5:

Who coined the term Fog computing?

a. IBM

b. CISCO

c. All of these

d. None of these

Correct Answer: b. CISCO

Detailed Solution: CISCO coined the term Fog computing. (Please refer Lecture 44@4:18)

QUESTION 6:

Fill in the blank. The concept of _____ enables physical hardware to be shared among multiple entities.

a. Hardware virtualization

b. Software virtualization

c. Module virtualization

d. All of these

Correct Answer: a. Hardware virtualization

Detailed Solution: The concept of hardware virtualization enables physical hardware to be shared among multiple entities. (Please refer to Page 262, Chapter 11, Introduction to IoT. S. Misra, A. Mukherjee, and A. Roy, 2020. Cambridge University Press.)

QUESTION 7:

Openstack is a free open source software for cloud framework simulation and experimentation with various cloud applications.

a. True

b. False

Correct Answer: a. True

Detailed Solution: Openstack is a free open source software for cloud framework simulation and experimentation with various cloud applications. It can be downloaded and installed for free. Refer Lecture 41.

QUESTION 8:

In IoT, temporal sensitivity of data DOES NOT play an important role

a. True

b. False

Correct Answer: b. False

Detailed Solution: IoT data can be classified in to time sensitive data, less time sensitive data and data not sensitive to time. Hence time sensitivity plays a big role in IOT data classification. Refer lecture 44 on Fog Computing

---

QUESTION 9:

Which among the following is NOT a component of OpenStack.

a. Horizon

b. Heat

c. Stellar

d. Neutron

Correct Answer: c. Stellar

Detailed Solution: Stellar is not a component of OpenStack. The rest are various components, including Nova, Glance, Swift etc. Refer lecture 41, ppt No. 4

QUESTION 10:

Which among the following is the principal feature of sensor clouds, with respect to sensor nodes?

a. Sensor monitoring

b. Sensor instantiation

c. Sensor virtualization

d. Sensor collection

Correct Answer: c. Sensor virtualization

Detailed Solution: Sesnor virtualization is the principal feature of sensor clouds and their utility. Refer lecture 42 and 43 on Sensor cloud

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QUESTION 11:

The optimal composition of _____ is a management issue in sensor-cloud.

a. Logistics

b. Pricing

c. Caching

d. Virtual sensor nodes

Correct Answer: d. Virtual sensor nodes

Detailed Solution: The optimal composition of Virtual sensor nodes is a management issue in sensor-cloud. (Please refer Lecture 43@4:39)

QUESTION 12:

How many different types of caching mechanism are there in sensor cloud?

a. 1

b. 4

c. 2

d. 3

Correct Answer: c. 2

Detailed Answer: Internal Cache (IC) and External Cache (EC) are two different types of caching mechanisms used in sensor cloud. Refer lecture 43, ppt No. 13

QUESTION 13:

Data from an IoT device is transferred to cloud via a network, which is then processed at the cloud and then a response is sent back to the IoT device from the cloud after processing. The time it takes for one-way data transfer between the node and cloud is 10s and the data processing time at the cloud is 'x' seconds. It takes a total of 25s for the entire to and fro transfer of data between the sensor and cloud along with processing at the cloud. What is the value of x?

a. 10s

b. 5s

c. 15s

d. 20s

Correct Answer: b. 5s

Detailed Solution: Time taken for one-way data transfer between the node and cloud is 10s. Total time taken for the data transfer is 25s. So 25=10+x+10 (transfer from node to cloud+processing at cloud+transfer from cloud to node). Thus x=5s.

QUESTION 14:

Which among the following is true?

a. Fog computing acts as a complement to cloud computing.

b. Fog computing is a replacement for cloud computing.

c. Fog computing and cloud computing are the same.

d. Fog computing is more powerful than cloud computing (with respect to resources).

Correct Answer: a. Fog computing acts as a complement to cloud computing.

Detailed Solution: Fog computing and cloud computing are complementary technologies.

Fog helps in bringing the cloud closer to the IoT devices. (Please refer Lecture 45@1:06)

QUESTION 15:

Which component of OpenStack do you use to access all the other components?

a. Horizon

b. Glance

c. Neutron

d. None of these

Correct Answer: a. Horizon

Detailed Solution: Horizon is the dashboard of OpenStack which provides the GUI and from where you

can access other components. Please refer Lecture 41@3:54

**********END**********

Introduction to Internet of Things

Assignment-Week 10

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15 **Total marks: 15 X 1= 15**

QUESTION 1:

Which among the following are active connected entities in a holistic smart city environment?

a. Police station

b. Banks

c. Transport centers

d. All of the above

Correct Answer: d. All of the above

Detailed Solution: Refer Lecture 46@4:45.

QUESTION 2:

With the help of ICT tools, it is possible to increase and improve citizen participation for a good governance based smart city

a. True

b. False

Correct Answer: a. True

Detailed Solution: Refer Lecture 46@11:20.

QUESTION 3:

Which among the following is a possible challenge with respect to smart parking lots?

a. Efficient auto-routing of vehicles

b. Locating current vacant spots

c. Auto-charging of vehicles

d. All of the given

Correct Answer: d. All of the given

Detailed Solution: All of the given options are indeed potential challenges as well. Refer Lecture 46@24:37.

QUESTION 4:

What refers to combining information from multiple sensor sources?

a. Information Collection

b. Multi-sensor deployment

c. Multi-sensor dissemination

d. Multi-sensor data fusion

Correct Answer: d. Multi-sensor data fusion

Detailed Solution: Multi-sensor data fusion combines information from multiple sensor sources. (Please refer Lecture 47@6:52)

QUESTION 5:

Which of the following is one of the theory of evidence-based mathematical methods of data fusion?

a. Belief function
b. Bayesian analysis
c. ANN
d. None of these

Correct Answer: a. Belief function

Detailed Solution: Belief function is one of the theory of evidence-based mathematical methods of data fusion**.** (Please refer Lecture 47 @11:49)

QUESTION 6:

With respect to data fusion from multiple IoT sensors, does outlier data present with a challenge?

a. No
b. Yes

Correct Answer: b. Yes

Detailed Solution: Refer Lecture 47@8:13.

QUESTION 7:

Which of the following is a phase of ICV development?

a. Based on 2G

b. Based on 4G LTE

c. Vehicles connected to cloud

d. All of these

Correct Answer: d. All of these

Detailed Solution: The phases of ICV development: Phase 1: Based on 2G, Phase 2: Based on 4G LTE, Phase 3: Vehicles connected to cloud (Please refer Lecture 50@12:28)

QUESTION 8:

With which of the following can the decision-making gap between the sensors and the actuators be bridged.

a. SDN

b. OpenStack Horizon

c. Artificial Intelligence (AI)

d. Arduino IDE

Correct Answer: c. Artificial Intelligence (AI)

Detailed Solution: Refer Lecture 47@12:14 onwards.

QUESTION 9:

Which of the following statements are true about the HAN standards?

Statement I: Physical and MAC layers are defined by IEEE802.15.4.

Statement II: Network layer is defined by Zigbee.

Statement III: Application layer is defined by IEEE802.15.4

a. Statements I and II

b. Statements I and III

c. Statements II and III

d. Statements I, II and III

Correct Answer: a. Statements I and II

Detailed Solution: Physical and MAC layers are defined by IEEE802.15.4. Network layer and Application layers are defined by Zigbee. (Please refer Lecture 48@16:11)

QUESTION 10:

What is UPnP?

a. Uninterrupted Post-messaging

b. Universal Pull Streaming

c. Universal Plug and Play

d. Unhindered Public Networking

Correct Answer: c. Universal Plug and Play

Detailed Solution: Refer Lecture 48@12:53.

QUESTION 11:

What are the disadvantages of V2X communication?

a. Increased traffic safety

b. Tracking of movement

c. Efficient use of fuel

d. None of these

Correct Answer: b. Tracking of movement

Detailed Solution: Disadvantages of V2X communication includes tracking of movement, violation of privacy, loss of data control, etc. (Please refer Lecture 50@21:04)

QUESTION 12:

Mobility of vehicles in a V2X environment limit which of the following that restricts the use of TCP/IP for V2X communication?

a. Communication between vehicular infrastructure

b. Localization of data

c. Backbone routing in IP core networks

d. Human-vehicle interaction

Correct Answer: b. Localization of data

Detailed Answer: TCP/IP works best with localized data, which is not present in V2X environments. This restricts the use of TCP/IP for V2X communication. Refer Lecture 49@12:33 onward.

QUESTION 13:

In VANET, link durations are long and easily scaled-up to include all the vehicles on the road?

a. True

b. False

Correct Answer: b. False

Detailed Solution: Link durations are short due to the highly dynamic nature of VANETs.

(Please refer Lecture 49 @18:00)

QUESTION 14:

CCN is derived from ICN architecture.

a. True

b. False

Correct Answer: a. True

Detailed Solution: CCN (Content Centric Networking) is derived from Information Centric Networking (ICN) (Please refer Lecture 49@15:32).

QUESTION 15:

In an ICV environment, efficient cooperation between different vehicles on a highway can lead to a safer scenario with respect to collision and avoiding incoming traffic.

a) True

b) False

Correct Answer: a. True

Detailed Solution: Refer Lecture 50@2:00.

**************END*************

Introduction to Internet of Things

Assignment-Week 11

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15 **Total marks: 15 X 1= 15**

QUESTION 1:

Which among the following is the most probable application scenario for a smart grid?

a. Home automation

b. Hospital networks

c. Intelligent power plants

d. Crop monitoring

Correct Answer: c. Intelligent power plants

Detailed Solution: Refer Lecture 51@4:20.

QUESTION 2:

With respect to a smart grid, which stakeholders are potentially benefitted?

a. Energy Service providers

b. Energy consumers/customers

c. Both energy service provides and consumers

d. Neither energy service providers nor consumers.

Correct Answer: c. Both energy service providers and consumers

Detailed Solution: Refer Lecture 51@13:20.

QUESTION 3:

It is not possible to perform load forecasting using a smart grid.

a. True

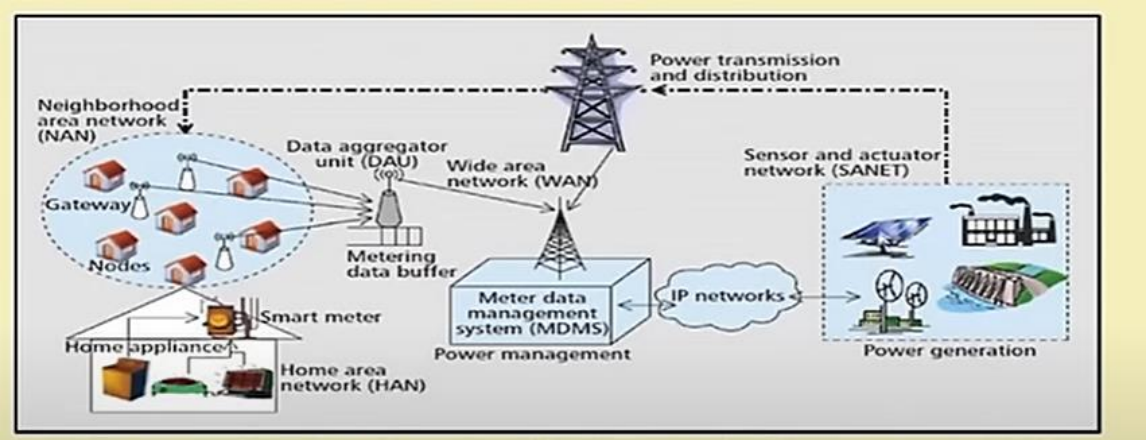
b. False

Correct Answer: b. False

Detailed Solution: Load forecasting is possible in a smart grid. Refer Lecture 51@22:00.

QUESTION 4:

With respect to the following Smart Grid architecture, which among the following is the most probable utility of the IP network?



a. IP network has no utility

b. IP network is used to connect smart grid components globally for seamless data transfer

c. IP network is used for multimedia video streaming only

d. IP network is used to induce more congestion

Correct Answer: b. IP network is used to connect smart grid components globally for seamless data transfer

Detailed Solution: Refer Lecture 51@23:00 onward.

QUESTION 5:

Smart Home is an isolated concept and is not integrable with smart grid?

a. False

b. True

Correct Answer: a. False
Detailed Solution: Refer Lecture 51@28:01

QUESTION 6:

Which of the following is a cloud application of smart grid?

a) Information management

b) Energy management

c) Security

d) All of these

Correct Answer: d. All of these

Detailed Solution: Energy management, information management and security are all the cloud applications in smart grid (Please refer Lecture 52@21:55)

QUESTION 7:

Which of the following is not a vulnerability of Smart Grid?

a) Integrity

b) Physical threats

c) Dynamic system attacks

d) None of these

Correct Answer: d. None of these

Detailed Solution: Integrity, physical threats and dynamic system attacks are all

the vulnerabilities of smart grids (Please refer Lecture 52@16:56)

QUESTION 8:

IIoT corresponds to which industrial revolution?

a. 1st

b. 2nd

c. 3rd

d. 4th

Correct Answer: d. 4th

Detailed Solution: Refer Lecture 53@10:00 onwards.

QUESTION 9:

IIoT is inherently data intensive.

a. Yes

b. No

Correct Answer: a. Yes

Detailed Solution: In IIoT, big data analytics plays an important part, hence it is inherently data intensive. Refer Lecture 53@16:28 onward.

QUESTION 10:

Which among the following is one of the requirements and utility of IIoT?

a. Power plant interruption
b. Power plant virtualization
c. Power plant decentralization
d. Power plant denotification

Correct Answer: b. Power plant virtualization

Detailed Solution: Refer Lecture 53@20:17.

QUESTION 11:

Smart Grid follows which type of flow of energy?

a. Bidirectional
b. Unidirectional
c. Both a and b
d. Neither a nor b

Correct Answer: a. Bidirectional

Detailed Solution: Smart grid follows bidirectional flow of energy. (Please refer Lecture 51@5:41)

QUESTION 12:

What is the Flow of data?

a. Acquisition>Generation>Storage>Analysis
b. Generation>Storage>Analysis>Acquisition
c. Generation>Acquisition>Storage>Analysis
d. None of these

Correct Answer: c. Generation>Acquisition>Storage>Analysis

Detailed Solution: The flow of the data is Generation, Acquisition, Storage and Analysis(Please refer Lecture 55@19:29)

QUESTION 13:

Intelligent transport system is least likely to render which of the following connectivity?

a. Vehicle-to-vehicle connectivity

b. Vehicle-to-sensor connectivity

c. Vehicle-to-road infrastructure

d. Vehicle-to-home connectivity

Correct Answer: d. Vehicle-to-home connectivity

Detailed Solution: ITS provides Vehicle-to-vehicle connectivity, Vehicle-to-sensor connectivity, Vehicle-to-road infrastructure and Vehicle-to-internet connectivity. (Please refer Lecture 54@4:19)

QUESTION 14:

Approximately around _____ of the total data available currently in the world is unstructured.

a. 20 %

b. 40 %

c. 60 %

d. 80%

Correct Answer: d. 80%

Detailed Solution: Unstructured data accounts for 80% of the total data available today in the world. (Please refer Lecture 55@9:23)

QUESTION 15:

SQL manages _____ data.

a) Unstructured
b) Corrupt
c) Structured
d) Non-organized

Correct Answer: c. Structured

Detailed Solution: Refer Lecture 55@8:56.

**********END**********

Introduction to Internet of Things

Assignment-Week 12

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15 **Total marks: 15 X 1= 15**

QUESTION 1:

Qualitative analysis refers to the process by which numerical data is analyzed?

a. True

b. False

Correct Answer: b. False

Detailed Solution: Refer Lecture 56@2:46.

QUESTION 2:

Which of the following data analysis technique involve the use of study of difference of variance?

a. ARIMA

b. ANOVA

c. DNN

d. OpenFlow

Correct Answer: b. ANOVA

Detailed Solution: Refer Lecture 56@10:42 onward.

QUESTION 3:

Given that you have an independent variable and that you want to predict the dependent variable based on the relationship between the two variables. Which among the following technique would you use?

a. ANOVA

b. ARIMA

c. Regression Analysis

d. Pre-analysis

Correct Answer: c. Regression Analysis.

Detailed Solution: Refer Lecture 56@15:13 onwards.

QUESTION 4:

With respect to AgriSens, how many logical layers are there in its architecture?

a. Perception Layer

b. Processing Layer

c. Application Layer

d. All of the given

Correct Answer: d. All of the given

Detailed Solution: Refer Lecture 57@6:12 onward.

QUESTION 5:

AgriSens supports real-time monitoring of soil moisture conditions and instant reporting to a dashboard.

a. False

b. True

Correct Answer: b. True
Detailed Solution: Refer Lecture 57, practical AgriSens deployment.

QUESTION 6:

What is the data aggregator is also known as in the context of IoT in smart healthcare?

a) CPU

b) LPU

c) APU

d) PPU

Correct Answer: b.LPU

Detailed Solution: Refer Lecture 58@9:23.

QUESTION 7:

Fill in the blanks. The effect size for determining statistical significance is the standardized _____ difference between two groups.

a. Median

b. Mean

c. Inter quartile range

d. None of the above

Correct Answer: b. Mean

Detailed Solution: The effect size is the standardized mean difference between two groups.

(Please refer lecture Data Handling and Analytics- Part II @ 17:15)

QUESTION 8:

Processing the sensed data on the device itself is known as _____ approach.

a. Network based

b. In-place

c. Out of the place

d. None of these

Correct Answer: b. In-place

Detailed Solution: Processing the sensed data on the device itself is known as in-place

approach. (Please refer lecture Activity monitoring Case Study - I @ 20:19).

QUESTION 9:

Fill in the blank. Processing the handheld activity device data with artificial intelligence can be used for _____.

a. Fall detection

b. Heart rate detection

c. Vehicle detection

d. All of these

Correct Answer: a. Fall detection

Detailed Solution: Processing the handheld activity device data with artificial intelligence can be used for detecting sudden fall of a person. (Please refer Lecture 60@11:56)

QUESTION 10:

Which of the following is an assumption of ANOVA?

a) Homogeneity of variances

b) Normally distributed response variable

c) Independence of observations

d) All of these

Correct Answer: d) All of these

Detailed Solution: ANOVA assumes the following:

Homogeneity of variances: The variances within each group should be approximately equal.

Normality: The response variable should follow a normal distribution within groups.

Independence: Observations should be independent of each other. These assumptions are critical for the validity of ANOVA results. (Refer to Lecture 56 @ 12:30).

QUESTION 11:

Select the statement(s) that denote the type of ANOVA.

Statement I: One way analysis

Statement II: Two way analysis

Statement III: K-way analysis

a. Statement I

b. Statement II

c. Statements I, II, and III

d. None of these

Correct Answer: c. Statements I, II, and III

Detailed Solution: The types of ANOVA includes One way analysis, Two way analysis and K-way analysis (Please refer Lecture 56@11:57)

QUESTION 12:

AmbuSense is a privacy-aware system

a. True

b. False

Correct Answer: a. True

Detailed Solution: The AmbuSense is a strictly privacy-aware system with patient-identity masking. (Please refer Lecture 58@24:12)

QUESTION 13:

The two most relevant sensors directly used in agriculture are _____.

a. Soil moisture and ECG sensor

b. Soil moisture and water level sensor

c. ECG sensor and water level sensor

d. All of these

Correct Answer: b. Soil moisture and water level sensor

Detailed Solution: Soil moisture and water level sensors are the necessary sensors generally used in agriculture. (Please refer Lecture 57@13:11)

QUESTION 14:

Examples of dispersion measures include _____ and _____.

a. Discrete, categorical

b. Continuous, quantitative

c. Discrete, quantitative

d. Range, Variance

Correct Answer: d. Range, Variance

Detailed Solution: Examples of dispersion measures include Range and Variance (Please refer Lecture 56@13:51)

QUESTION 15:

Suppose that your smartphone tilts by an angle of 15 degrees. Which among the following sensors will detect this tilt?

a) HC-SR04
b) Gyroscope
c) Accelerometer
d) Monometer

Correct Answer: b. Gyroscope

Detailed Solution: Refer Lecture 60@3:06.

**********END**********