



**Introduction to
Internet of Things
Assignment-Week 1**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

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QUESTION 1:

What is the full form of IoT?

- a. Internet of Tasks
- b. Internet of Things**
- c. Internet of Tasks
- d. None of these

Correct Answer: b. 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?

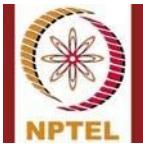
- a. Low-power embedded systems
- b. Cloud Computing
- c. Machine Learning
- d. All of these**

Correct Answer: d. All 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 enablers of IoT?

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

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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/are a function of an IoT Gateway?

- a. Connects the IoT LAN to a WAN
- b. Can implement several LAN and WAN
- c. Forwards packets between LAN and WAN on the IP layer
- d. All of these

Correct Answer: d. All of these

Detailed Solution: The functionalities of an IoT Gateway are –

- a. Connects the IoT LAN to a WAN
- b. Can implement several LAN and WAN
- c. Forwards packets between LAN and WAN on the IP layer

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



QUESTION 5:

State whether the following statement is True or False.

Statement: “The same address of an IoT device may be repeated in the domain of another gateway. The gateway has a unique network prefix, which can be used to identify them globally.”

- a. True
- b. False

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Correct Answer: a. True

Detailed Solution: The same address of an IoT device may be repeated in the domain of another gateway. The gateway has a unique network prefix, which can be used to identify them globally.

See lecture 2 (Introduction to IoT – Part - II) @ 07:00

QUESTION 6:

In _____ a node/network is connected to multiple networks for improved reliability.

- a. Transparent roaming
- b. Multi-homing
- c. None of these
- d. Both (a) and (b)

Correct Answer: b. Multi-homing

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:

The IPv4 notation uses _____ number of bits to represent an address.

- a. 33
- b. 32
- c. Both (a) and (b)
- d. None of these

Correct Answer: b. 32



Detailed Solution: The IPv4 notation uses 32 bits to represent an address.

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

QUESTION 8:

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The “Source Address” field in the IPv6 header is of _____ bits in length.

- a. 32
- b. 64
- c. 128
- d. None of these

Correct Answer: c. 128

Detailed Solution: The IPv6 header uses 128 bits to represent the “Source Address”.

See lecture 2 (Introduction to IoT – Part - II) @ 18:03

QUESTION 9:

A device which detects or measures a physical property and records, indicates, or otherwise responds to it is called _____?

- a. A sensor
- b. An actuator
- c. A Transducer
- d. A processor

Correct Answer: a. A sensor

Detailed Solution: A device which detects or measures a physical property and records, indicates, or otherwise responds to it is called a sensor.

See lecture 3 (Sensing) @ 03:28

QUESTION 10:



A microphone is an example of an _____.

- a. Input device and actuator
- b. Only actuator
- c. Only Transducer
- d. Input device and transducer**

Correct Answer: d. Input device and transducer

Detailed Solution: A microphone is an example of an input device and transducer. 

See lecture 3 (Sensing) @ 10:31

QUESTION 11:

State whether the following statement is True or False.

Statement: A sensor is only sensitive to the measured property for which it has been made (e.g., A temperature sensor senses the ambient temperature of a room.)

- a. True**
- b. False

Correct Answer: a. True

Detailed Solution: A sensor is only sensitive to the measured property (e.g., A temperature sensor senses the ambient temperature of a room.)

See lecture 3 (Sensing) @ 12:11

QUESTION 12:

Based on the data type, sensors are classified as _____.

- a. Only scalar
- b. Only vector
- c. Scalar and Vector/Multimedia**
- d. None of these

Correct Answer: c. Scalar and Vector/Multimedia

Detailed Solution: Based on the data type, sensors are classified as Scalar and Vector/Multimedia.

See lecture 3 (Sensing) @ 13:05



QUESTION 13:

State whether the following statement is True or False.

Statement: The more the resolution of a sensor, the less accurate its precision.

- a. True
- b. False

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Correct Answer: b. False

Detailed Solution: The more the resolution of a sensor, the more accurate its precision.

See lecture 3 (Sensing) @ 12:46

QUESTION 14:

The sensitivity of a sensor under real conditions may differ from the value specified. This is called _____.

- a. Physical error
- b. Sensitivity error
- c. Rounding error
- d. None of these

Correct Answer: b. Sensitivity error

Detailed Solution: The sensitivity of a sensor under real conditions may differ from the value specified.

See lecture 3 (Sensitivity error) @ 20:56

QUESTION 15:

A sensor node is made up of which of the following?

- a. Sensor/Sensing units
- b. A processing unit
- c. A power unit
- d. All of these

Correct Answer: d. All of these



Detailed Solution: A sensor node is made up of a combination of sensor/sensors, a processor unit, a radio unit, and a power unit.

See Page number – 101, Chapter - 5, Book - Introduction to IoT, Authors – Sudip Misra, Anandarup Mukherjee, and Arijit Roy, Publisher – Cambridge University Press, Edition – 1 (2021)

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**Introduction to
Internet of Things
Assignment-Week 2**

TYPE OF QUESTION: MCQ/MSQ

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Number of questions: 15

Total marks: 15 X 1= 15

QUESTION 1:

The full form of MQTT is

- a. Message Query Telemetry Transport
- b. Message Queue Telemetry Transport**
- c. Message Queue Telemedicine Transport
- d. None of these

Correct Answer: b. Message Queue Telemetry Transport

Detailed Solution: The full form of MQTT is Message Queue Telemetry Transport.

See lecture 6 (Basics of IoT Networking – Part II) @ 01:51

QUESTION 2:

In MQTT, a _____ controls the publish-subscribe messaging pattern.

- a. Message Broker**
- b. Publishers
- c. Subscribers
- d. All of these

Correct Answer: a. Message Broker

Detailed Solution: In MQTT, a message broker controls the publish-subscribe messaging pattern.



See lecture 6 (Basics of IoT Networking – Part II) @ 03:33

QUESTION 3:

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Which of the following is NOT a Data Protocol in IoT?

- a. MQTT
- b. CoAP
- c. Websocket
- d. None of these

Correct Answer: d. None of these

Detailed Solution: The data protocols in IoT are –

- a) MQTT
- b) CoAP
- c) AMQP
- d) Websocket

See lecture 6 (Basics of IoT Networking – Part II) @ 01:16

QUESTION 4:

In MQTT for IoT, the Publishers are _____.

- a. Lightweight sensors
- b. Actuators
- c. Processing units
- d. None of these

Correct Answer: a. Lightweight sensors

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 NOT a method in MQTT?

- a. Break
- b. Connect
- c. Disconnect
- d. None of these

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Correct Answer: a. Break

Detailed Solution: Following are the methods in MQTT –

- a. Connect
- b. Disconnect
- c. Subscribe
- d. Unsubscribe
- e. Publish

See lecture 6 (Basics of IoT Networking – Part II) @ 06:18

QUESTION 6:

Which of the following protocols in IoT have been designed for Machine to Machine (M2M) applications such as smart energy and building automation?

- a. MQTT
- b. CoAP
- c. Websocket
- d. All of these

Correct Answer: b. CoAP

Detailed Solution: CoAP has been designed for Machine to Machine (M2M) applications such as smart energy and building automation.



See lecture 7 (Basics of IoT Networking – Part III) @ 00:41

QUESTION 7:

Similar to HTTP, CoAP utilizes which of the following for operation?

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- a. GET
- b. PUT
- c. PUSH
- d. All of these

Correct Answer: d. All of these

Detailed Solution: Similar to HTTP, CoAP utilizes GET, PUT, PUSH, DELETE message requests to retrieve, create, update, and delete, respectively.

See lecture 7 (Basics of IoT Networking – Part III) @ 08:24

QUESTION 8:

What is the full form of XMPP in IoT?

- a. Extensible Markup Page Processing
- b. Extensible Messaging and Presence Protocol
- c. Both (a) and (b)
- d. Neither (a) nor (b)

Correct Answer: b. Extensible Messaging and Presence Protocol

Detailed Solution: XMPP stands for Extensible Messaging and Presence Protocol.

See lecture 7 (Basics of IoT Networking – Part III) @ 11:58

QUESTION 9:

State whether the following statement is True or False.



Statement: XMPP is an open standard protocol.

- a. True
- b. False

Correct Answer: a. True

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Detailed Solution: XMPP is an open standard protocol.

See lecture 7 (Basics of IoT Networking – Part III) @ 11:58

QUESTION 10:

What is the full form AMQP in context of IoT protocol?

- a. Another Message Queuing Protocol
- b. Anchored Message Queuing Protocol
- c. Advanced Message Queuing Protocol
- d. None of these

Correct Answer: c. Advanced Message Queuing Protocol

Detailed Solution: AMQP stands for Advanced Message Queuing Protocol.

See lecture 8 (Basics of IoT Networking – Part IV) @ 0:41

QUESTION 11:

What is the basic unit of data in the AMQP protocol?

- a. Chunk
- b. Byte
- c. Frame
- d. None of these

Correct Answer: c. Frame

Detailed Solution: In AMQP, the basic unit of data is called a frame.



See lecture 8 (Basics of IoT Networking – Part IV) @ 0:41

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QUESTION 12:

Which of the following is/are exchange types in AMQP?

- a. Direct
- b. Fan-out
- c. Topic
- d. All of these

Correct Answer: d. All of these

Detailed Solution: The AMQP exchange types are –

- a) Direct
- b) Fan-out
- c) Topic
- d) Header

See lecture 8 (Basics of IoT Networking – Part IV) @ 08:56

QUESTION 13:

IoT networks can be classified in which of the following type/types?



- a. Non-Beacon Enabled
- b. Beacon Enabled
- c. None of these
- d. Both (a) and (b)

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

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Detailed Solution: The IoT networks can be classified into two types such as

- i. Non-Beacon Enabled
- ii. Beacon Enabled

See lecture 9 (Connectivity Technologies – Part-I) @ 10:19

QUESTION 14:

The OSI model has _____ layers.

- a. 6
- b. 7
- c. 4
- d. 8

Correct Answer: b. 7

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 destination node address of the packet
- b. The intermediate hop in the network
- c. Both (a) and (b)
- d. None of these

Correct Answer: a. The destination node address of the packet

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)

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**Introduction to
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Assignment-Week 3**

TYPE OF QUESTION: MCQ/MSQ

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Number of questions: 15

Total marks: 15 X 1= 15

QUESTION 1:

State whether the following statement is true or false.

Statement: There is no network layer in Wired HART

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: There is no network layer in Wired HART.

See lecture 11 (Connectivity Technologies-III) @ 05:22

QUESTION 2:

HART operates only in _____ GHz ISM band.

- a. 2.4
- b. 4.8
- c. 4.9
- d. 4.4

Correct Answer: a. 2.4

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



See lecture 11 (Connectivity Technologies-III) @ 05:43

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QUESTION 3:

Super-frames in HART consist of grouped _____ wide timeslots.

- a. 10ms
- b. 20ms
- c. 55ms
- d. None of these

Correct Answer: a. 10ms

Detailed Solution: Super-frames in HART consist of grouped 10ms wide timeslots.

See lecture 11 (Connectivity Technologies-III) @ 07:05

QUESTION 4:

The process of identifying channels consistently affected by interference and removing them from use is known as _____.

- a. Channel hopping
- b. Channel aggregating
- c. Frequency aggregating
- d. Channel blacklisting

Correct Answer: d. Channel blacklisting

Detailed Solution: Channel Blacklisting identifies channels consistently affected by interference and removes them from use.

See lecture 11 (Connectivity Technologies-III) @ 07:30



QUESTION 5:

State whether the following statement is True or False

Statement: Each node is supervised by the application manager and it guides them on when and where to send packets.

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- a. True
- b. False

Correct Answer: b. False

Detailed Solution: The Network manager supervises each node in the network and guides them on when and where to send packets.

See lecture 11 (Connectivity Technologies-III) @ 12:14

QUESTION 6:

FeliCa is commonly found in which country?

- a. Japan
- b. India
- c. USA
- d. None of these

Correct Answer: a. Japan

Detailed Solution: FeliCa is commonly found in Japan.

See lecture 11 (Connectivity Technologies-III) @ 17:52

QUESTION 7:

State whether the following state is true or false.

Statement: NFC tags found in supermarket products are examples of passive NFC.

- a. True



- b. False

Correct Answer: a. True

Detailed Solution: Passive NFC tags found in supermarket products are examples of passive NFC.

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See lecture 11 (Connectivity Technologies-III) @ 18:47

QUESTION 8:

Active NFC devices are able to _____?

- a. transmit information
- b. collect information
- c. Both (a) and (b)
- d. None of these

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

Detailed Solution: Active NFC devices are able to collect as well as transmit information.

See lecture 11 (Connectivity Technologies-III) @ 18:52

QUESTION 9:

A _____ in NFC emits a small electric current which creates a magnetic field that in turn bridges the physical space between the devices.

- a. reader
- b. writer
- c. destroyer
- d. None of these

Correct Answer: a. reader



Detailed Solution: A reader in NFC emits a small electric current which creates a magnetic field that in turn bridges the physical space between the devices

See lecture 11 (Connectivity Technologies-III) @ 20:31

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QUESTION 10:

Bluetooth technology is based on _____.

- a. WiFi
- b. LoRa
- c. Ad-hoc technology
- d. None of these

Correct Answer: c. Ad-hoc technology

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

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

QUESTION 11:

Bluetooth technology operates in the unlicensed industrial, scientific and medical (ISM) band at _____ to _____ GHz.

- a. 3.2, 5.6
- b. 2.4, 2.485
- c. 5.0, 5.89
- d. None of these

Correct Answer: b. 2.4, 2.485

Detailed Solution: Bluetooth technology operates in the unlicensed industrial, scientific and medical (ISM) band at 2.4 to 2.485 GHz.

See lecture 12 (Connectivity Technologies-IV) @ 04:39



QUESTION 12:

Z-wave operates at _____ MHz in the US and _____ MHz in Europe. 

- a. 1008, 989
- b. 908.42, 868.42
- c. 767.56, 855.28
- d. None of these

Correct Answer: b. 908.42, 868.42

Detailed Solution: Z-wave operates at 908.42 MHz in the US and 868.42 MHz in Europe.

See lecture 13 (Connectivity Technologies-V) @ 3:40

QUESTION 13:

State whether the following statement is true or false.

Statement: Sensor nodes have limited battery life.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: Sensors nodes have limited battery life.

See lecture 14 (Sensor Networks-I) @ 13:15

QUESTION 14:

State whether the following statement is true or false.



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

- a. True
- b. False

Correct Answer: a. True

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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. 250 kbps
- b. 250 Mbps
- c. 260 kbps
- d. 260 Mbps

Correct Answer: a. 250 kbps

Detailed Solution: Zigbee commonly uses 250 kbps data rate.

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**Introduction to
Internet of Things
Assignment-Week 4**

TYPE OF QUESTION: MCQ/MSQ

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Number of questions: 15

Total marks: 15 X 1= 15

QUESTION 1:

State whether the following statement is true or false.

Statement: Coverage in WSN is defined as the area-of-interest that is covered satisfactorily.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: Coverage in WSN is defined as the area-of-interest that is covered satisfactorily.

See lecture 17 (Sensor Networks-IV) @ 01:44

QUESTION 2:

If transmission range $\geq 2^*$ sensing range,

- a. Coverage implies connectivity
- b. Coverage implies greater coverage
- c. Both (a) and (b)
- d. None of these

Correct Answer: a. Coverage implies connectivity



Detailed Solution: If transmission range $\geq 2 \times$ sensing range, coverage implies connectivity.

See lecture 17 (Sensor Networks-IV) @ 04:14

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QUESTION 3:

Forest fire monitoring in WSN is an example of which type of reporting?

- a. Event driven
- b. On-demand
- c. Scattered
- d. None of these

Correct Answer: a. Event driven

Detailed Solution: Forest fire monitoring in WSN is an example of event driven reporting.

See lecture 17 (Sensor Networks-IV) @ 08:13

QUESTION 4:

State whether the following statement is true or false.

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

- a. True
- b. False

Correct Answer: a. True



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

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QUESTION 5:

What is the full form of AUV in the context of mobile wireless sensor networks?

- a. Aerial and Underwater Vehicle
- b. Ambient and Underprivileged Vehicle
- c. Autonomous Underwater Vehicle
- d. None of these

Correct Answer: c. Autonomous Underwater Vehicle

Detailed Solution: The full form of AUV is Autonomous Underwater Vehicle.

See lecture 18 (Sensor Networks-V) @ 07:56

QUESTION 6:

In mobile wireless sensor networks, the sensor nodes are capable of _____ and measuring the condition of their surrounding environments.

- a. collaborating with one another
- b. destroying one another
- c. Both (a) and (b)
- d. None of these

Correct Answer: a. collaborating with one another

Detailed Solution: In mobile wireless sensor networks, the sensor nodes are capable of collaborating with one another and measuring the condition of their surrounding environments.



See lecture 18 (Sensor Networks-V) @ 04:56

QUESTION 7:

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State whether the following statement is true or false.

Statement: In mobile sensor networks, the sensor nodes come in close proximity of sink and deliver the data.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: In mobile sensor networks, the sensor nodes come in close proximity of sink and deliver the data.

See lecture 18 (Sensor Networks-V) @ 06:19

QUESTION 8:

Which of the following is/are a challenge/challenges in Human-centric Sensing?

- a. Energy of devices
- b. Participant selection
- c. Both (a) and (b)
- d. None of these

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

Detailed Solution: The following are the challenges in human-centric sensing -

- a. Energy of devices
- b. Participant selection
- c. Privacy of users

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

QUESTION 9:



Which of the following is/are a feature/features of UAV networks?

- a. Mesh or star networks
- b. Multi-tasking
- c. Large coverage area
- d. All of these

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Correct Answer: d. All of these

Detailed Solution: The following are the features of UAV networks -

- d. Mesh or star networks
- e. Multi-tasking
- f. Large coverage area

See lecture 19 (UAV Networks) @ 02:43

QUESTION 10:

State whether the following statement is true or false.

Statement: Frequently change in network topology is a benefit of UAV networks.

- a. False
- b. True

Correct Answer: a. False

Detailed Solution: Frequently change in network topology is an issue of UAV networks.

See lecture 19 (UAV Networks) @ 05:29

QUESTION 11:

Which of the following is NOT a feature of multi-UAV system?

- a. Low failures



- b. High scalability
- c. Low survivability
- d. High cost

Correct Answer: c. Low survivability

Detailed Solution: Following are some of the features of multi-UAV system –

- a. Low failures
- b. High scalability
- c. High survivability
- d. High cost

See lecture 19 (UAV Networks) @ 07:53

QUESTION 12:

State whether the following statement is true or false.

Statement: M2M communications are free of any human intervention.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: M2M communications are free of any human intervention.

See lecture 20 (Machine to Machine Communication) @ 05:44



QUESTION 13:

Which of the following is NOT an M2M node type?

- a. Secure End Node
- b. High End Node
- c. Low End Mode
- d. Mid End Node

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Correct Answer: a. Secure End Node

Detailed Solution: M2M node types are as follows –

- a. Low End Node
- b. Mid End Node
- c. High End Node

See lecture 20 (Machine to Machine Communication) @ 10:43

QUESTION 14:

What is the full form of M2SP in the context of Machine-to-Machine Communication?

- a. M2M Service Platform
- b. M2M Session Packet
- c. M2M Secure Packaging
- d. None of these

Correct Answer: a. M2M Service Platform

Detailed Solution: M2SP stands for M2M Service Platform.

See lecture 20 (Machine to Machine Communication) @ 16:31

QUESTION 15:

The _____ provides integrated services based on device collected data-sets.



- a. M2M Application Platform
- b. M2M Service Platform
- c. M2M Hardware Platform
- d. None of these

Correct Answer: a. M2M Application Platform

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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

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Number of questions: 15

Total marks: 15 X 1= 15

QUESTION 1:

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

- a. Large scale of co-operation
- b. Global heterogeneity
- c. Unknown IoT device configuration
- d. All of these**

Correct Answer: d. All of these

Detailed Solution: Current challenges in IoT are –

- a. Large scale of co-operation
- b. Global heterogeneity
- c. Unknown IoT device configuration
- d. Semantic conflicts

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



QUESTION 2:

When two IoT devices wish to communicate, semantic conflict in such a scenario in IoT interoperability refers to _____.

- a. Two devices built by the same manufacturer
- b. Two devices having different processing and business logic
- c. Two devices sensing the same physical parameter
- d. Two devices having different deployment location

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Correct Answer: b. Two devices having different processing and business logic

Detailed Solution: Semantic conflict refers to when different IoT devices have different processing and business execution logic. Refer Lecture 21@5:32

QUESTION 3:

Which of the following issues needs to be addressed while solving user interoperability?

- a. Device characterization and identification
- b. Syntactic interoperability
- c. Both (a) and (b)
- d. None of these

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

Detailed Solution: All of the options given should be addressed while solving user interoperability issues. Refer Lecture 21@15:16.

QUESTION 4:



State whether the following statement is true or false

Statement: UMB core interoperability component is responsible for converting physical devices into virtually abstracted ones.

- a. False
- b. True

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Correct Answer: a. False

Detailed Solution: UMB-A is responsible for converting physical devices into virtually abstracted ones.
(Please refer Lecture 21@27:16)

QUESTION 5:

What is the full form of UMB in IoT interoperability?

- a. Universal Middleware Bridge
- b. Universal Main Bridge
- c. Universal Main Bracket
- d. None of these

Correct Answer: a. Universal Middleware Bridge

Detailed Solution: UMB stands for Universal Middleware Bridge.

Refer Lecture 21@22:16.

QUESTION 6:



Which of the following is NOT a function available in the Servo library for Arduino ?

- a. kill()
- b. destroy()
- c. burn()
- d. All of these

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Correct Answer: d. All of these

Detailed Solution: The following are NOT functions of the Servo library for Arduino –

- a. kill()
- b. destroy()
- c. burn()

The Refer Lecture 25@18:08.

QUESTION 7:

Arduino UNO Board is open source?

- a. True
- b. False

Correct Answer: a. True

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

Refer Lecture 22@05:21.



QUESTION 8:

Arduino Uno board accepts which type of input/inputs?

- a. Analog
- b. Digital
- c. Both (a) and (b)
- d. None of these

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

Detailed Solution: Arduino UNO board accepts analog and digital signals as input.

Refer Lecture 22@05:21

QUESTION 9:

Arduino boards are based on which of the following microcontroller/microcontrollers.

- a. ATMEGA328
- b. ATMEGA32u4
- c. Both (a) and (b)
- d. None of these

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

Detailed Solution: Arduino board are based on the following microcontrollers –

- a. ATMEGA328
- b. ATMEGA32u4
- c. ATMEGA2560
- d. AT91SAM3X8E



Refer Lecture 22 @ 06:20

QUESTION 10:

What is the clock speed of the Arduino Uno board?

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- a. 16MHz
- b. 17MHz
- c. 8MHz
- d. None of these

Correct Answer: a. 16MHz

Detailed Solution: The clock speed of Arduino Uno board is 16MHz.

Refer Lecture 22 @ 07:13.

QUESTION 11:

Consider the following Arduino sketch.

```
int r = 4;
int g = 5;
void setup(){
    Serial.begin(9600);
    pinMode(r,INPUT);
    pinMode(g,__??__);
}

void loop()
{
    int val = analogRead(r);
    if( val > 10)
    {
        digitalWrite(g,HIGH);
    }
    else
    {
        digitalWrite(g,HIGH);
    }
    delay(500);
}
```



What must be inserted in the place of ‘??’ within the second pinMode() function in void setup()?

- a. INPUT
- b. OUTPUT**
- c. None of these
- d. Anyone of these is okay

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Correct Answer: b. OUTPUT

Detailed Solution: Since pin ‘g’ is writing digital values, it is required to set in OUTPUT mode. Refer Lecture 22-23.

QUESTION 12:

The “Verify” option in the Arduino IDE checks the code for _____.

- a. Compilation errors**
- b. Improper hardware connection
- c. Both (a) and (b)
- d. None of these

Correct Answer: a. Compilation errors

Detailed Solution: The “Verify” option in the Arduino IDE checks the code for compilation errors. Refer Lecture 24.

QUESTION 13:

How many pins does the DHT Digital Humidity and Temperature sensor have?



- a. 2
- b. 3
- c. 4
- d. None of these

Correct Answer: c. 4

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Detailed Solution: DHT Digital Humidity and Temperature sensor has 4 pins.

See lecture 24 @ 03:23

QUESTION 14:

What is the function of the delay() function in an Arduino program?

- a. Initializes a sensor
- b. Introduces a delay for the specified time
- c. Stores the sensor value
- d. None of the above

Correct Answer: b. Introduces a delay for the specified time

Detailed Solution: The delay() function introduces a delay in the operation of the microcontroller for the specified duration.

See lecture 24 @ 13:51

QUESTION 15:

What does the following code snippet do?

Servo myservo;

- a. Creates a variable to store the sensor value
- b. Instructs the sensor to sense data
- c. Creates an instance of servo to use it in the Arduino sketch
- d. None of these



Correct Answer: c. Creates an instance of servo to use it in the Arduino sketch

Detailed Solution: The code snipped “Servo myservo;” creates an instance of servo to use in the Arduino sketch.

Refer Lecture 25 @5:32

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*****END*****



**Introduction to
Internet of Things
Assignment-Week 6**

TYPE OF QUESTION:MCQ/MSQ

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Number of questions: 15

Total marks: 15 X 1 = 15

QUESTION 1:

Python can only be used to build small applications.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: With open-source nature, python forms a strong backbone to build large applications.

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 3:46)

QUESTION 2:

Which of the following is NOT a Python IDE?

- a. Spyder
- b. PyCharm
- c. Both (a) and (b)
- d. None of these



Correct Answer: d. None of these

Detailed Solution: Spyder and PyCharm are examples of Python IDE.

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 05:12)

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QUESTION 3:

State whether the following statement is true or false.

Statement: To indicate different blocks of code, python follows rigid indentation.

- a. False
- b. True**

Correct Answer: b. True

Detailed Solution: To indicate different blocks of code, python follows rigid indentation
(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 07:25).

QUESTION 4:

Which of the following is not a data-type in Python?

- a. List
- b. Branch**
- c. Tuple
- d. None of these

Correct Answer: b. Branch

Detailed Solution: The data-types in python are –



- a. List
- b. Tuple
- c. Dictionary

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 15:20).

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QUESTION 5:

State whether the following statement is true or false.

Statement: Python allows us to read and write files.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: Python allows us to read and write files.

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @ 01:17)

QUESTION 6:

Which of the following is NOT a mode to open a file?

- a. Read mode
- b. Write mode
- c. Append mode
- d. None of these

Correct Answer: d. None of these



Detailed Solution: The four basic modes to open a file in python are –

- a. Read mode
- b. Write mode
- c. Append mode
- d. Both read and write mode

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(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @ 03:00)

QUESTION 7:

State whether the following command to install the PIL library in Linux 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:

State whether the following statement is correct for creating a socket ‘s’ in python.

s = socket.socket(socket_family, socket_type, protocol=0)

- a. Correct
- b. Incorrect

Correct Answer: a. Correct

Detailed Solution: The statement *s = socket.socket(socket_family, socket_type,*



protocol=0) creates a socket in python.

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @24:27).

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QUESTION 9:

What is a Raspberry Pi?

- a. A computer on your palm
- b. Single board computer
- c. Low cost
- d. All of these

Correct Answer: d. All of these

Detailed Solution: Raspberry pi is –

- a. A computer on your palm
- b. Single board computer
- c. Low cost
- d. Easy to access

(Please refer to lecture INTRODUCTION TO RASPBERRY PI-I @05:00).

QUESTION 10:

Which of the following are required for a basic set up of Raspberry Pi?

- a. Monitor
- b. Keyboard
- c. Mouse
- d. All of these



Correct Answer: d. All of these

Detailed Solution: The following are required for a basic set up of Raspberry Pi –

- a. Monitor
- b. Keyboard
- c. Mouse

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See lecture INTRODUCTION TO RASPBERRY PI-I @ 11:33

QUESTION 11:

Which of the following keyboard key combination writes (i.e saves) the code to the file in nano editor ?

- a. Ctrl+O
- b. Ctrl+X
- c. Both (a) and (b)
- d. None of these

Correct Answer: a. Ctrl+O

Detailed Solution: Ctrl+O writes the code to the file in nano editor.

See lecture INTRODUCTION TO RASPBERRY PI-II @ 10:44

QUESTION 12:

A relay module for Raspberry Pi has how many terminals ?

- a. 3
- b. 2
- c. 4
- d. 5

Correct Answer: a. 3



Detailed Solution: A relay module for Raspberry Pi has 3 terminals.

See lecture IMPLEMENTATION OF IOT WITH RASPBERRY PI-I @ 06:01.

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QUESTION 13:

State whether the following statement is true or false.

Statement: Adafruit provides a library to work with the DHT22 sensor.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: Adafruit provides a library to work with the DHT22 sensor.

See lecture IMPLEMENTATION OF IOT WITH RASPBERRY PI-I @ 09:19

QUESTION 14:

What is the function of the close() function in python programming while handling files.

- a. This function does not exist in python
- b. It closes the current connection to the file and ensures that the file is free to use for other resources
- c. None of these
- d. Both (a) and (b)



Correct Answer: b. It closes the current connection to the file and ensures that the file is free to use for other resources

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Detailed Solution: The close() function in python ensures that the file is free to use for other resources.

(Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @ 4:44)

QUESTION 15:

Where is the Raspbian image found?

- a. It is not available on the Internet
- b. It is available as image file from the Raspberry Pi official website
- c. It can only be purchased from offline vendor
- d. None of these

Correct Answer: b. It is available as image file from the Raspberry Pi official website

Detailed Solution: Raspbian image can be downloaded from the Raspberry Pi official website.

(Please refer to lecture INTRODUCTION TO RASPBERRY PI-I @ 12:32)

*****END*****



Introduction to Internet of Things

Assignment-Week 7

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

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QUESTION 1:

DHT Sensor refers to Digital Humidity and Temperature Sensor.

- a. **True**
- b. False

Correct Answer: a. True

Detailed Solution: DHT Sensor refers to Digital Humidity and Temperature Sensor.
(Please refer to lecture Implementation of IoT with Raspberry Pi- II @ 3:28)

QUESTION 2:

Fill in the blanks. _____ is a python library used for plotting the data in 2D.

- a. List
- b. Numpy
- c. Pandas
- d. **Matplotlib**

Correct Answer: d. Matplotlib

Detailed Solution: Matplotlib is a python library used for plotting the data in 2D. (Please refer to lecture Implementation of IoT with Raspberry Pi- III @ 12:13)

QUESTION 3:

Fill in the blanks. _____ makes a scatter plot of the given points.

- a. ion()
- b. figure()
- c. **Scatter()**
- d. None of these



Correct Answer: c. Scatter()

Detailed Solution: Scatter() makes a scatter plot of the given points. (Please refer to lecture Implementation of IoT with Raspberry Pi- III @ 23:25).

QUESTION 4:

What are the two main challenges of SDN?

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- a. File placement and Node placement
- b. Rule placement and Controller placement
- c. All of these
- d. None of these

Correct Answer: b. Rule placement and Controller placement

Detailed Solution: Rule placement and Controller placement are the two main challenges of SDN. (Please refer to lecture Software Defined Networking- Part- I @ 16:49)

QUESTION 5:

In soft-timeout, all the rules are deleted from the switch.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: In soft-timeout, if no flow is received associated with a rule for a particular time, the rule is deleted. In hard-timeout, all rules are deleted from the switch. (Please refer to lecture Software Defined Networking- Part- I @ 24:57)

QUESTION 6:

Which of the following is a component of SDN?

- a. Hardware switches
- b. Flow-rules
- c. None of these
- d. All of these

Correct Answer: d. All of these

Detailed Solution: Hardware switches and Flow rules are both the components of SDN. (Please refer to lecture Software Defined Networking- Part- I @ 15:47)



QUESTION 7:

What is introduced if a controller is down in SDN?

- a. **Backup controller**
- b. Intro controller
- c. All of these
- d. None of these

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Correct Answer: a. Backup Controller

Detailed Solution: Backup controller is introduced if a controller is down in SDN. (Please refer to lecture Software Defined Networking- Part- II @ 8:29)

QUESTION 8:

Southbound API is used to communicate between control layer and application layer.

- a. True
- b. False**

Correct Answer: b. False

Detailed Solution: Southbound API is used to communicate between control layer and infrastructure layer. (Please refer to lecture 34 Software Defined Networking- Part- II @1:41).

QUESTION 9:

SDN is OpenFlow.

- a. True
- b. False**

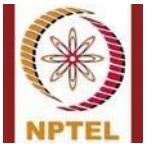
Correct Answer: b. False

Detailed Solution: SDN is not OpenFlow. It is a technology/concept. (Please refer to lecture 33 Software Defined Networking- Part- I @25:55).

QUESTION 10:

Which of the following forwards the sensed data based on the ID of the source node?

- a. Value-centric data forwarding
- b. ID-centric data forwarding**
- c. All of these
- d. None of these



Correct Answer: b. ID-centric data forwarding

Detailed Solution: ID-centric data forwarding forwards the sensed data based on the ID of the source node. See lecture 35 @ 9:50

QUESTION 11:

Does integrating SDN in IoT provide intelligent routing decisions?

- a. Yes
- b. No

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Correct Answer: a. Yes

Detailed Solution: Integrating SDN in IoT provides intelligent routing decisions. See lecture 35 @ 17:25

QUESTION 12:

Are Indigo and LINC Open source?

- a. Yes
- b. No

Correct Answer: a. Yes

Detailed Solution: Indigo and LINC are both open source. See lecture 33@ 26:43.

QUESTION 13:

Which of the following is used to communicate among multiple controllers in the control layer?

- a. East-Westbound APIs
- b. Northbound APIs
- c. All of these
- d. None of these

Correct Answer: a. East-Westbound APIs

Detailed Solution: East-Westbound APIs are used to communicate among multiple controllers in the control layer.

See lecture 34 @ 02:39

QUESTION 14:



How many requests can a controller handle through a single thread?

- a. 200/sec
- b. 50/sec
- c. None of these
- d. All of these

Correct Answer: a. 200/sec

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Detailed Solution: A controller can handle 200 requests in a second through a single thread. (Please refer to lecture 34@ 3:47)

QUESTION 15:

Size of the ternary content-addressable memory is not limited at the switches.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Size of the ternary content-addressable memory is limited at the switches (Please refer to lecture 33 @ 20:41)

*****END*****



**Introduction to
Internet of Things
Assignment-Week 8**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1 = 15

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QUESTION 1:

Which of these is used for efficient base-station coordination for addressing inter-cell interference?

- a. Path management
- b. Routing protocols
- c. Flow-table paradigm
- d. Logically centralized control**

Correct Answer: d. Logically centralized control

Detailed Solution: Logically centralized control is used for efficient base-station coordination for addressing inter-cell interference (Please refer Lecture 36@3:02)

QUESTION 2:

Which of these takes last k-th location instances to predict the next location in Mobi-Flow?

- a. Order-K Markov predictor**
- b. Flow-rule placement
- c. All of these
- d. None of these

Correct Answer: a. Order-K Markov predictor

Detailed Solution: Order-K Markov predictor takes last k-th location instances to predict the next location in Mobi-Flow. (Please refer Lecture 36@15:52)



QUESTION 3:

What are the two components of ODIN?

- a. Odin server and agent
- b. Odin server and client
- c. **Odin agent and master**
- d. None of these

Correct Answer: c. Odin agent and master

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Detailed Solution: Odin agent and master are the two components of ODIN.
(Please refer Lecture 36@10:16)

QUESTION 4:

Which of the following is placed to deal with mice-flows ?

- a. Flow rules
- b. Exact rules
- c. Match rules
- d. **Wild card rules**

Correct Answer: d. Wild card rules

Detailed Solution: Wild card rules can be placed to deal with mice-flows. (Please refer Lecture 36 @18:23)

QUESTION 5:

Fill in the blank.

_____ refers to heterogeneous computing nodes distributed over a wide area to perform very large tasks.

- a. Cluster Computing
- b. Utility Computing
- c. **Grid Computing**
- d. None of these

Correct Answer: c. Grid Computing



Detailed Solution: Grid Computing refers to heterogeneous computing nodes distributed over a wide area to perform very large tasks. (Please refer Lecture 37 @6:48)

QUESTION 6:

Which of the following is a property of cloud computing?

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- a. On-demand network access
- b. High level generalization of computation
- c. On-demand services
- d. All of these

Correct Answer: d. All of these

Detailed Solution: On-demand network access, high level generalization of computation and on-demand services are some of the properties of cloud computing. (Please refer Lecture 37@12:43)

QUESTION 7:

Which of the following statements are true about the different types of cloud?

Statement I: Inter-cloud is a global cloud of clouds.

Statement II: Volunteer cloud is a type of distributed cloud.

Statement III: Public cloud has low security.

- a. Statements I and II
- b. Statements I and III
- c. Statements II and III
- d. Statement I, II and III

Correct Answer: d. Statements I, II and III

Detailed Solution: All the three statements are correct for the cloud. Inter-cloud is a global cloud of clouds. Volunteer cloud is a type of distributed cloud. And also Public cloud has low security. (Please refer Lecture 37@31:11, 32: 43, 32: 25)



QUESTION 8:

Fill in the blank.

_____ means independent of device or location.

- a. Scalable
- b. Reliability
- c. Agile
- d. **Ubiquitous**

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Correct Answer: d. Ubiquitous

Detailed Solution: Ubiquitous means independent of device or location. (Please refer Lecture 37@18:06)

QUESTION 9:

Fill in the blank.

_____ represents the on-demand delivery of computing infrastructure in the cloud.

- a. Software-as-a-Service
- b. Storage-as-a-Service
- c. Network-as-a-Service
- d. **Infrastructure-as-a-Service**

Correct Answer: d. Infrastructure-as-a-Service

Detailed Solution: Infrastructure-as-a-Service represents the on-demand delivery of computing infrastructure in the cloud. (Please refer Lecture 38@4:29)

QUESTION 10:

Fill in the blank. Hybrid cloud is a blend of _____ cloud.

- a. **Public and private**
- b. SaaS and Paas
- c. All of these



- d. None of these

Correct Answer: a. Public and private

Detailed Solution: Hybrid cloud is a blend of public and private cloud. (Please refer Lecture 38@9:50)

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QUESTION 11:

Software-as-a-Service does not support a fully pay-as-you-go model.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Software-as-a-Service supports a fully pay-as-you-go model. (Please refer Lecture 38@13:25)

QUESTION 12:

Which of the following describes the quality of services expected by the customer?

- a. Mass production
- b. Internet evolution
- c. Automation
- d. Service Level Agreement

Correct Answer: d. Service Level Agreement

Detailed Solution: Service Level Agreement describes the quality of services expected by the customer (Please refer Lecture 39@5:23)



QUESTION 13:

Which of the following are the accesses enabled by the access control layers in the cloud?

- a. Service access
- b. Server access
- c. Database access
- d. All of these

Correct Answer: d. All of these

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Detailed Solution: Service access, Server access and Database access are the accesses enabled by the access control layers in the cloud (Please refer Lecture 39@24:31)

QUESTION 14:

Reputation refers to the belief of an entity's standing by the community.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: Reputation refers to the belief of an entity's standing by the community. (Please refer Lecture 39@25:15)

QUESTION 15:

Which of the following is true about GreenCloud?

- a. GreenCloud monitors the energy consumption of servers, switches, etc.
- b. GreenCloud was developed as an extension of NS2.
- c. All of these
- d. None of these

Correct Answer: c. All of these

Detailed Solution: GreenCloud monitors the energy consumption of servers, switches, etc. It was developed as an extension of NS2. (Please refer Lecture 40@16:25)



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*****END*****

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**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:

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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 2:

Where is the sensed data sent for further processing in WSNs?

- a. Client node
- b. Central node
- c. Collect node
- d. Sink node

Correct Answer: d. Sink node

Detailed Solution: The sensed data is sent to sink node for further processing in WSNs (Please refer Lecture 42@4:04)



QUESTION 3:

Select the statement(s) that denote the advantages of cloud computing.

Statement I: Elasticity

Statement II: Pay-per-use

Statement III: Self Service

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- 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 advantages of cloud computing are Elasticity, pay-per-use and self service (Please refer Lecture 42@5:58)

QUESTION 4:

Which of the following is a limitation of WSN?

- a. Price
- b. Post deployment maintenance
- c. Battery lifetime
- d. All of these

Correct Answer: d. All of these

Detailed Solution: Price, post deployment maintenance and battery lifetime are the main



limitations of WSN. (Please refer Lecture 42@11:01)

QUESTION 5:

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

- a. End-users
- b. Sensor-Cloud Service Provider
- c. None of these
- d. All of these

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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 6:

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 7:

Who coined the term Fog computing?

- a. IBM
- b. CISCO**
- c. All of these
- d. None of these

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Correct Answer: b. CISCO

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

QUESTION 8:

What are the issues related to the current cloud model?

- a. Volume
- b. Latency
- c. All of these**
- d. None of these

Correct Answer: c. All of these

Detailed Solution: Volume, bandwidth and latency are some of the issues related to the current cloud model. (Please refer Lecture 44@10:30)

QUESTION 9:

Sensor data is processed in the cloud before it is sent to the fog.



- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Sensor data is processed in the fog before it is sent to the cloud. (Please refer Lecture 45@6:11)

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QUESTION 10:

What is the type of received data according to which Fog nodes work?.

- a. Non-time sensitive data
- b. Very time-sensitive data
- c. Less time-sensitive data
- d. All of these

Correct Answer: d. All of these

Detailed Solution: Fog nodes work according to the type of data which are very time-sensitive, less time-sensitive and non-time sensitive data. (Please refer Lecture 45@11:39)

QUESTION 11:

Which of the following are the advantages of Fog?

- a. Quick decision making
- b. Nodes can be mobile
- c. Reduces the risk of latency
- d. All of these

Correct Answer: d. All of these

Detailed Solution: The advantages of Fog includes quick decision making, nodes



can be mobile and Fog reduces the risk of latency . (Please refer Lecture 45@20:57)

QUESTION 12:

Which of the following requires the analysis at the nearest node?

- a. Non-time sensitive data
- b. Most time-sensitive data
- c. Less time-sensitive data
- d. None of these

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Correct Answer: b. Most time-sensitive data

Detailed Solution: Most time-sensitive data requires the analysis at the nearest node. (Please refer Lecture 45@15:46)

QUESTION 13:

Fog nodes cannot connect and leave the network when necessary.

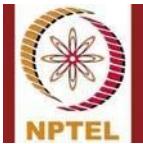
- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Fog nodes can connect and leave the network when necessary. (Please refer Lecture 45@25:27)

QUESTION 14:

Which of the following is used by the fog applications to increase the speed of service accessibility?



- a. Low power
- b. Good network connection
- c. Accelerators
- d. Analytics

Correct Answer: c. Accelerators

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Detailed Solution: Accelerators increase the speed of service accessibility. (Please refer to Page 260, Chapter 11, Introduction to IoT. S. Misra, A. Mukherjee, and A. Roy, 2020. Cambridge University Press.)

QUESTION 15:

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.)



**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:

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Smart homes can be used for _____.

- a. Home monitoring
- b. Conservation of resources like electricity
- c. Security and safety
- d. **All of these**

Correct Answer: d. All of these

Detailed Solution: Smart homes can be used for home monitoring, conservation of resources, security and safety. (Please refer Lecture 46@25:02)

QUESTION 2:

Which of the following is an iot challenge in smart cities?

- a. Reliability
- b. Large scale
- c. Big data
- d. **All of these**

Correct Answer: d. All of these

Detailed Solution: Reliability, Large scale and Big data are some of the challenges of iot in smart cities. (Please refer Lecture 46@32:57)



QUESTION 3:

Select the statement(s) that are true for smart parking.

Statement I: Smart parking reduces traffic congestion

Statement II: Smart parking increases urban mobility

Statement III: Smart parking reduces fuel consumption

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- 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: Smart parking reduces traffic congestion and fuel consumption, and increases urban mobility (Please refer Lecture 47@16:46)

QUESTION 4:

Which of the following is a functional layer in smart parking?

- a. Information Collection
- b. System Deployment
- c. Service Dissemination
- d. All of these

Correct Answer: d. All of these

Detailed Solution: Information Collection, System Deployment and Service Dissemination are



all the functional layers in smart parking. (Please refer Lecture 47@17:24)

QUESTION 5:

The mobile sensing in smart parking collects the information _____.

- a. in-place
- b. along the route
- c. None of these
- d. All of these

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Correct Answer: b. along the route

Detailed Solution: The mobile sensing in smart parking collects the information along the route. (Please refer Lecture 47@19:47)

QUESTION 6:

The network which provides amalgamation of various systems within a home is known as _____.

- a. Local Area Network
- b. Metropolitan Area Network
- c. Global Area Network
- d. Home Area Network

Correct Answer: d. Home Area Network

Detailed Solution: The network which provides amalgamation of various systems within a home is known as Home Area Network. (Please refer Lecture 48@8:24)



QUESTION 7:

Which of the following is the correct full form of DLNA Standards for HAN?

- a. Digital Lifestyle Network Alliance
- b. Digital Living Network Alliance
- c. Digital Lifestyle Network Algorithm
- d. None of these

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Correct Answer: b. Digital Living Network Alliance

Detailed Solution: DLNA stands for Digital Living Network Alliance standards.
(Please refer Lecture 48@13:49)

QUESTION 8:

Which of the following is a part of ZigBee Alliance?

- a. Mitsubishi
- b. Honeywell
- c. All of these
- d. None of these

Correct Answer: c. All of these

Detailed Solution: The Zigbee Alliance is composed of Mitsubishi, Honeywell, Invensys, Motorola and Philips. (Please refer Lecture 48@15:46)



QUESTION 9:

Network and Application layers are defined by IEEE 802.15.4 in Zigbee.

a. True

b. False

Correct Answer: b. False

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Detailed Solution: Network and Application layers are defined by Zigbee in Zigbee. (Please refer Lecture 48@16:42)

QUESTION 10:

Which of the following is a feature of Content Centric Networking?

- a. Hierarchically named data
- b. Scalable data dissemination
- c. In-network caching
- d. All of these

Correct Answer: d. All of these

Detailed Solution: Hierarchically named data, Scalable data dissemination and In-network caching are all the features of CCN. (Please refer Lecture 49@15:17)

QUESTION 11:

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 12:

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Which of the following is a property of V2X?

- a. Restricted to a single source
- b. Distributed architecture
- c. Both of these
- d. None of these

Correct Answer: b. Distributed architecture

Detailed Solution: V2X follows a distributed architecture. (Please refer Lecture 49@12:06)

QUESTION 13:

The vehicles cannot be mobile in the Ad-hoc domain of VANET.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: The vehicles are mobile in the Ad-hoc domain of VANET.. (Please refer Lecture 50@16:59)

QUESTION 14:



Which of the following is a domain of VANET?

- a. In-vehicle
- b. Ad-hoc
- c. All of these
- d. None of these

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Correct Answer: c. All of these

Detailed Solution: Both of the In-vehicle and Ad-hoc are the two domains of VANETs. (Please refer Lecture 50@14:36)

QUESTION 15:

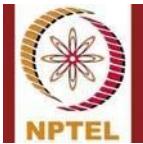
Fill in the blank. ICV is based on _____.

- a. Dedicated Short Range Communication
- b. Directed Short Range Communication
- c. Dedicated Small Range Communication
- d. All of these

Correct Answer: a. Dedicated Short Range Communication

Detailed Solution: ICV is based on Dedicated Short Range Communication.

(Please refer Lecture 50@7:22)



**Introduction to
Internet of Things
Assignment-Week 11**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1 = 15

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QUESTION 1:

What are some of the other names of the smart grids?

- a. Electricity with a brain
- b. Energybar
- c. Electrolyte
- d. All of these

Correct Answer: a. Electricity with a brain

Detailed Solution: Smart grids are also known as Electricity with a brain, Energy internet, and Electronet. (Please refer Lecture 51@8:33)

QUESTION 2:

Traditional Grid follows which type of flow of energy?

- a. Unidirectional
- b. Bidirectional
- c. Both a and b
- d. None of these

Correct Answer: a. Unidirectional

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



QUESTION 3:

Which of the following is a benefit associated with smart grids?

- a. Efficient transmission of electricity
- b. Lower electricity rates
- c. Improved security
- d. All of these

Correct Answer: d. All of these

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Detailed Solution: Smart Grids provide efficient transmission of electricity, lower electricity rates and Improved security. (Please refer Lecture 51 @ 11:26)

QUESTION 4:

Which of the following is a way of consumer engagement?

- a. Net metering
- b. Time-of-Use pricing
- c. Financial incentives
- d. All of these

Correct Answer: d. All of these

Detailed Solution: Net metering, Time-of-Use pricing and Financial incentives are ways of consumer engagements. (Please refer Lecture 51 @ 32:31)

QUESTION 5:

Fill in the blank.

In _____, a home can have power from distributed resources.

- a. Peaking
- b. Islanding
- c. Neither a nor b
- d. Both a and b

Correct Answer: b. Islanding



Detailed Solution: In islanding, a home can have power from distributed resources.(Please refer Lecture 51 @31:20)

QUESTION 6:

Which of the following aggregates energy consumption of a certain geographical area?

- a. Data Aggregator Units
- b. Meter Data Management System
- c. Buffer
- d. None of these

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Correct Answer: a. Data Aggregator Units

Detailed Solution: Data Aggregator Units aggregates energy consumption of a certain geographical area (Please refer Lecture 52@15:03)

QUESTION 7:

Which of the following statements are true about Dynamic System Attacks?

Statement I: Replay attacks compromises sensors and monitors their outputs.

Statement II: D-DIA can lead to a system collapse.

Statement III: Covert attack is a closed loop version of replay attacks.

- a. Statements I and II
- b. Statements I and III
- c. Statements II and III
- d. Statement I, II and III

Correct Answer: d. Statements I, II and III

Detailed Solution: Replay attacks compromises sensors and monitors their outputs. D-DIA can lead to a system collapse. Covert attack is a closed loop version of replay attacks. (Please refer Lecture 52@20:03)



QUESTION 8:

Fill in the blank.

_____ is a centralized coordinator for smart grid communication.

- a. Gateway
- b. Meter
- c. AMH
- d. **MDMS**

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Correct Answer: d. MDMSs

Detailed Solution: MDMS is a centralized coordinator for smart grid communication. (Please refer Lecture 52@15:32)

QUESTION 9:

Fill in the blank.

_____ are available protocols for smart home appliances.

- a. C-Bus
- b. DECT
- c. EnOcean
- d. **All of these**

Correct Answer: d. All of these

Detailed Solution: C-Bus, DECT, EnOcean and Universal Powerline Bus are available protocols for smart home appliances. (Please refer Lecture 52@12:35)

QUESTION 10:

Fill in the blank. _____ is the time required to transmit the data.

- a. Scalability
- b. Topology
- c. Throughput



- d. **Latency**

Correct Answer: d. Latency

Detailed Solution: Latency is the time required to transmit the data. (Please refer Lecture 53@21:20)

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QUESTION 11:

IIoT is based on Wrap & Replace approach.

- a. True
b. **False**

Correct Answer: b. False

Detailed Solution: IIoT is based on wrap & re-use approach. (Please refer Lecture 53@9:53)

QUESTION 12:

Which of the following happened in the 3rd Revolution?

- a. Mass production
b. IIoT
c. Mechanized production
d. **None of these**

Correct Answer: d. None of these

Detailed Solution: Internet evolution and automation happened in the 3rd Revolution. (Please refer Lecture 53@10:06)



QUESTION 13:

Which of the following is used to improve the interoperability of different systems?

- a. Standardization
- b. Optimization
- c. Monitoring
- d. None of these

Correct Answer: a. Standardization

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Detailed Solution: Standardization improves the interoperability of different systems. (Please refer Lecture 54@16:09)

QUESTION 14:

Big data is characterized by 7 Vs.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: Big data is characterized by 7 Vs. (Please refer Lecture 55@10:36)

QUESTION 15:

What is Hadoop used in?

- a. Distributed processing of large datasets
- b. Small clusters of computers
- c. Both a and b
- d. None of these

Correct Answer: a. Distributed processing of large datasets

Detailed Solution: Hadoop is used for distributed processing of large datasets across Large clusters of computers (Please refer Lecture 55@23:18)



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*****END*****

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**Introduction to
Internet of Things
Assignment-Week 1**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

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QUESTION 1:

Which of the following is/are the characteristics of IoT?

- a. Efficient, scalable and associated architecture.
- b. Unambiguous naming and addressing.
- c. Abundance of sleeping nodes, mobile and non-IP device.
- d. All of the these

Correct Answer: d. All of the these

Detailed Solution: Characteristics of IoT are –

- a. Efficient, scalable and associated architecture.
- b. Unambiguous naming and addressing.
- c. Abundance of sleeping nodes, mobile and non-IP device.

See lecture 1 (Introduction to IoT – Part - I) @ 16:06

QUESTION 2:

A _____ allows us to use our smartphones to lock and unlock our door remotely at our homes or our businesses.

- a. Smart Meter
- b. ATM
- c. Digital Lock
- d. Web

Correct Answer: c. Digital Lock

Detailed Solution: Smartphones can be used to lock and unlock doors remotely, and business owners can change key codes rapidly to grant or restrict access to employees and guests.

See lecture 1 (Introduction to IoT – Part - I) @ 25:35



QUESTION 3:

The function/functions of an IoT Gateway is/are to?

- a. Forward packets between LAN and WAN and on the IP layer
- b. Connect IoT LAN to a WAN
- c. Both (a) and (b)
- d. None of these

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

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Detailed Solution: An IoT Gateway is a router connecting the IoT LAN to a WAN to the Internet, can implement several LAN and WAN, Forwards packets between LAN and WAN and on the IP layer.

See lecture 2 (Introduction to IoT – Part - II) @ 04:44

QUESTION 4:

Multi-homing is the concept where a node can be connected to multiple networks for _____.

- a. Reduced Reliability
- b. Improved Reliability
- c. None of these
- d. Both (a) and (b)

Correct Answer: b. Improved Reliability

Detailed Solution: Multi-homing is a concept where a node or an IoT device or a sub-network can be connected to multiple networks for improving the reliability.

See lecture 2 (Introduction to IoT – Part - II) @ 15:27

QUESTION 5:

A Passive Infrared Ray (PIR) sensor is used for _____?

- a. Humidity Detection
- b. Tilt Detection
- c. Obstacle Detection
- d. Smoke Detection

Correct Answer: c. Obstacle Detection

Detailed Solution: Passive Infrared Ray (PIR) sensor can be used to detect if there is any obstacle.

See lecture 3 (Sensing) @ 04:13



QUESTION 6:

For which of the following, Vector Sensors are required to measure or sense them?

- a. Color, Pressure, Temperature
- b. Orientation, Image
- c. None of these
- d. Both (a) and (b)

Correct Answer: b. Orientation, Image

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Detailed Solution: Vector Sensors produce output signal or voltage which is generally proportional to the magnitude, direction, as well as the orientation of the quantity being measured. Physical quantities such as sound, image, velocity, acceleration, orientation, etc. are all vector quantities, as only their magnitude is not sufficient to convey the complete information.

See lecture 3 (Sensing) @ 16:14

QUESTION 7:

The sensitivity of a sensor under real conditions may differ from the value specified. This is called _____?

- a. Maximal Error
- b. Minimal Error
- c. Median Error
- d. Sensitivity Error

Correct Answer: d. Sensitivity Error

Detailed Solution: The sensitivity of a sensor under real conditions may differ from the value specified. This is called sensitivity error.

See lecture 3 (Sensing) @ 19:33

QUESTION 8:

A random deviation of the signal that varies in time is called _____.

- a. Noise
- b. Sound
- c. Bias
- d. None of these

Correct Answer: a. Noise.

Detailed Solution: Noise is a random deviation of the signal that varies in time.



See lecture 3 (Sensing) @ 22:42

QUESTION 9:

A Relay Switch is an example of _____.

- a. A Sensor
- b. An Actuator
- c. A Transducer
- d. None of These

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Correct Answer: b. An Actuator

Detailed Solution: Relay Switch is an example of an actuator. It is an electromechanical switch that can be used to perform On/Off operations of electrical appliances.

See lecture 4 (Actuation) @ 01:37

QUESTION 10:

What is a Pneumatic Actuator?

- a. It is a type of actuator driven by compressed air or vacuum
- b. It is a type of actuator driven by fluid
- c. It is a type of actuator driven by solid
- d. None of these

Correct Answer: a. It is a type of actuator driven by compressed air or vacuum

Detailed Solution: A pneumatic actuator converts energy formed by vacuum or compressed air at high pressure into either linear or rotary motion.

See lecture 4 (Actuation) @ 07:55

QUESTION 11:

Which type of actuators tend to be compact, lightweight, economical, and with high power density?

- a. Thermal or Magnetic Actuators
- b. Hydraulic Actuators
- c. Both (a) and (b)
- d. None of these

Correct Answer: a. Thermal or Magnetic Actuators

Detailed Solution: Thermal or Magnetic Actuators can be actuated by applying thermal or



magnetic energy. They tend to be compact, lightweight, economical, and with high power density.

See lecture 4 (Actuation) @ 11:46

QUESTION 12:

Polymer based actuators designed to handle fragile objects like fruit harvesting in agriculture or manipulating internal organs in biomedicine are called?

- a. Pneumatic Actuators
- b. Soft Actuators
- c. Software Actuators
- d. Hardware Actuators

Correct Answer: b. Soft Actuators

Detailed Solution: Soft Actuators are polymer-based actuators designed to handle fragile objects like fruit harvesting in agriculture or manipulating internal organs in biomedicine.

See lecture 4 (Actuation) @ 14:55

QUESTION 13:

Full form of SMP is _____?

- a. Soft Memory Polymer
- b. Shape Memory Polymer
- c. Software Memory Polymer
- d. None of these

Correct Answer: b. Shape Memory Polymer

Detailed Solution: Shape Memory Polymer (SMP) actuators function similar to our muscles, even providing a response to a range of stimuli such as light, electrical, magnetic, heat, pH, and moisture changes.

See lecture 4 (Actuation) @ 15:16

QUESTION 14:

Duty Cycling of the sensors is managed by which component of IoT?

- a. Application
- b. Real-Time Kernel
- c. Radios
- d. Power Management Unit



Correct Answer: d. Power Management Unit

Detailed Solution: Power Management Unit does things like duty cycling of sensors that is how much time they are to be powered on and how much time they will be off.

See lecture 5 (Basics of IoT Networking – Part - I) @ 13:39

QUESTION 15:

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Which of the following are challenges of IoT

- a. Security
- b. Complexity Management
- c. Modeling and Analysis
- d. All of these

Correct Answer: d. All of these

Detailed Solution: IoT Challenges are –

- Security
- Modeling and Analysis
- Complexity Management
- Scalability
- Energy Efficiency
- Interfacing
- Interoperability
- Data Storage
- Data Analytics

See lecture 5 (Basics of IoT Networking – Part - I) @ 24:40

*****END*****



**Introduction to
Internet of Things
Assignment-Week 2**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

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QUESTION 1:

Which of the following is based on the publish-subscribe model?

- a. MQTT
- b. HTTP
- c. HTTPS
- d. All of these

Correct Answer: a. MQTT

Detailed Solution: Message Queue Telemetry Transport (MQTT) is a publish-subscribe based lightweight messaging protocol for use in conjunction with TCP/IP protocol.

See lecture 6 (Basics of IoT Networking – Part II) @ 01:51

QUESTION 2:

In MQTT, a topic to which a client is subscribed is updated in the form of messages and distributed by the _____?

- a. Publishers
- b. Message Broker
- c. Subscribers
- d. All of these

Correct Answer: b. Message Broker

Detailed Solution: A topic to which a client is subscribed is updated in the form of messages and distributed by the message broker.

See lecture 6 (Basics of IoT Networking – Part II) @ 03:33



QUESTION 3:

Which of the following is used when more than one level needs to be subscribed, such as the entire sub-tree, i.e., a multilevel wildcard?

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- a. +
- b. #
- c. \
- d. None of these

Correct Answer: b. #

Detailed Solution: If more than one level needs to be subscribed, such as the entire sub-tree, there is also a multilevel wildcard (#). It allows to subscribe to all underlying hierarchy levels. For example house/# is subscribing to all topics beginning with house.

See lecture 6 (Basics of IoT Networking – Part II) @ 12:40

QUESTION 4:

The CoAP protocol is designed for -.

- a. Heavy Web Application
- b. Publish-Subscribe Applications
- c. Machine-to-Machine (M2M) applications
- d. Both (a) and (b)

Correct Answer: c. Machine-to-Machine (M2M) applications

Detailed Solution: CoAP – Constrained Application Protocol. It is a web transfer protocol for use with constrained nodes and networks. Designed for Machine-to-Machine (M2M) applications such as smart energy and building automation. Based on Request-Response model between end-points.

See lecture 7 (Basics of IoT Networking – Part III) @ 00:35



QUESTION 5:

Statement I – The messaging sub-layer of CoAP, is responsible for reliability and duplication of messages.

Statement II – The request/response sub-layer is responsible for communication.

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Which of the above statement/statements is/are correct?

- Only Statement I
- Only Statement II
- Both Statement I and II
- Statement I Correct but Statement II Incorrect

Correct Answer: c. Both Statement I and II

Detailed Solution: The messaging sub-layer of CoAP, is responsible for reliability and duplication of messages while the request/response sub-layer is responsible for communication.

See lecture 7 (Basics of IoT Networking – Part III) @ 04:19

QUESTION 6:

Which of the following is a messaging mode in CoAP?

- Append
- Substitute
- Attempt
- Separate

Correct Answer: d. Separate

Detailed Solution: CoAP has four messaging modes

- Confirmable
- Non-Confirmable
- Piggyback
- Separate

See lecture 7 (Basics of IoT Networking – Part III) @ 05:29



QUESTION 7:

Which of the following provides for the discovery of services residing locally or across a network?

- a. Internet
- b. MQTT
- c. XMPP
- d. CoAP

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Correct Answer: c. XMPP

Detailed Solution: XMPP provides for the discovery of services residing locally or across a network, and the availability information of these services.

See lecture 7 (Basics of IoT Networking – Part III) @ 12:03

QUESTION 8:

AMQP is a protocol of which layer?

- a. Transport Layer
- b. Application Layer
- c. Network Layer
- d. Session Layer

Correct Answer: b. Application Layer

Detailed Solution: AMQP is an Application Layer protocol.

See lecture 8 (Basics of IoT Networking – Part IV) @ 01:41

QUESTION 9:

Which of the following is NOT a feature of the AMQP protocol?

- a. Closed Standard
- b. Security
- c. Reliability
- d. Routing

Correct Answer: a. Closed Standard

Detailed Solution: Features of AMQP are –

- Security
- Reliability
- Interoperability
- Routing
- Queuing
- Open Standard



See lecture 8 (Basics of IoT Networking – Part IV) @ 04:54

QUESTION 10:

There are a total of _____ number of AMQP frame types are defined that are used to initiate, control, and tear down the transfer of messages between two peers.

- a. Seven
- b. Eight
- c. Nine
- d. None of these

Correct Answer: c. Nine

Detailed Solution: Nine AMQP frame types are defined that are used to initiate, control, and tear down the transfer of messages between two peers.

See lecture 8 (Basics of IoT Networking – Part IV) @ 06:34

QUESTION 11:

The function/functions of the Queue component of the AMQP protocol is/are -

- a. Receive messages and route them to queues
- b. Separate queues for separate business process
- c. Consumer receive messages from queues
- d. Both (b) and (c)

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

Detailed Solution: The functions of the Queue components are to –

- Separate queues for separate business process
- Consumer receive messages from queues

See lecture 8 (Basics of IoT Networking – Part IV) @ 08:05



QUESTION 12:

Which of the following statements is/are false?

Statement – I: IEEE 802.15.4 is a well-known standard for low data-rate Wireless Personal Area Network (WPAN).

Statement – II: IEEE 802.15.4 standard operates in the ISM band.

- a. Statement - II
- b. Statement - I
- c. Both Statement I and II
- d. None of these

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Correct Answer: d. None of these

Detailed Solution: IEEE 802.15.4 is a well known standard for low data-rate Wireless Personal Area Network (WPAN). It operates in the ISM band.

See lecture 9 (Connectivity Technologies – Part-I) @ 03:00

QUESTION 13:

The IEEE 802.15.4 establishes functionalities in which layers?

- a. Application and Session Layers
- b. Transport and Data Link Layers
- c. Network and Session Layers
- d. Physical and Data Link Layers

Correct Answer: d. Physical and Data Link Layers

Detailed Solution: The IEEE 802.15.4 is useful for establishing functionalities in the Physical and Data Link Layers.

See lecture 9 (Connectivity Technologies – Part-I) @ 17:27



QUESTION 14:

Which is not a purpose of the ZigBee Device Object (ZDO)?

- a. Device Management
- b. Interfacing and Control Services
- c. Security
- d. Policies

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Correct Answer: b. Interfacing and Control Services

Detailed Solution: The functions of the ZigBee Device Object (ZDO) are –

- Device Management
- Security
- Policies

See lecture 9 (Connectivity Technologies – Part-I) @ 18:06

QUESTION 15:

State whether the following statement is True or False.

Statement: Similar to traditional barcodes and QR codes, RFID tag data cannot be read outside the line-of-sight.

- a. False
- b. True

Correct Answer: a. False

Detailed Solution: As compared to traditional barcodes and QR codes, RFID tag data can be read outside the line-of-sight.

See lecture 10 (Connectivity Technologies – Part-II) @ 17:33

*****END*****



**Introduction to
Internet of Things
Assignment-Week 3**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

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QUESTION 1:

Choose the correct option based on the following two statements on the HART Physical Layer.

Statement-I: It is derived from the IEEE 802.15.4 protocol.

Statement-II: It operated only in the 2.4 GHz ISM band.

- a. Statement-I True and Statement-II False
- b. Statement-I False and Statement-II True
- c. Both Statements I and II are False
- d. Both Statements I and II are True

Correct Answer: d. Both Statements I and II are True

Detailed Solution: HART Physical Layer is derived from the IEEE 802.15.4 protocol. It operated in the 2.4 GHz ISM band.

See lecture 11 (Connectivity Technologies-III) @ 05:44

QUESTION 2:

Which of the following characteristic of HART Data Link Layer helps to increase reliability and security?

- a. Channel Hopping and Channel Blacklisting
- b. Channel Crunching and Jamming
- c. Scattering
- d. All of these

Correct Answer: a. Channel Hopping and Channel Blacklisting

Detailed Solution: HART Data Link Layers incorporates channel hopping and channel blacklisting to increase reliability and security.

See lecture 11 (Connectivity Technologies-III) @ 06:23



QUESTION 3:

State True or False

Statement: Channel blacklisting in HART identifies channels consistently affected by interference and removes them from use.

- a. True
- b. False

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Correct Answer: a. True

Detailed Solution: Channel blacklisting in HART identifies channels consistently affected by interference and removes them from use.

See lecture 11 (Connectivity Technologies-III) @ 08:27

QUESTION 4:

At the MAC layer –

Statement-I: WirelessHART utilizes Time Division Multiple Access (TDMA).

Statement-II: ZigBee applies Carrier Sense Multiple Access with Collision Detection (CSMA/CD).

- a. Statement-I True and Statement-II False
- b. Statement-I False and Statement-II True
- c. Both Statements I and II are False
- d. Both Statements I and II are True

Correct Answer: d. Both Statements I and II are True.

Detailed Solution: At the MAC layer, WirelessHART utilizes Time Division Multiple Access (TDMA), allotting individual time slots for each transmission. ZigBee applies Carrier Sense Multiple Access with Collision Detection (CSMA/CD).

See lecture 11 (Connectivity Technologies-III) @ 15:07

QUESTION 5:

NFC works on the principal of

- a. Pressure
- b. Magnetic Induction
- c. Both (a) and (b)
- d. None of these



Correct Answer: b. Magnetic Induction

Detailed Solution: NFC works on the principle of magnetic induction.

See lecture 11 (Connectivity Technologies-III) @ 20:02

QUESTION 6:

Bluetooth technology is based on Ad-hoc technology also known as?

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- a. Ad-hoc Piconets
- b. Ad-hoc Micronets
- c. Ad-hoc Nanonets
- d. None of these

Correct Answer: a. Ad-hoc Piconets

Detailed Solution: Bluetooth technology is based on Ad-hoc technology also known as Ad-hoc Piconets.

See lecture 12 (Connectivity Technologies-IV) @ 04:05

QUESTION 7:

Class 2 Bluetooth radios have a range of about?

- a. 1 m
- b. 2 m - 5 m
- c. 10 m
- d. None of these

Correct Answer: c. 10 m

Detailed Solution: Class 2 radios are most commonly found in mobile devices and have a range of 10 meters.

See lecture 12 (Connectivity Technologies-IV) @ 05:16

QUESTION 8:

Which of the following is NOT a phase in Bluetooth connection establishment?

- a. Inquiry
- b. Booking
- c. Paging
- d. Connection

Correct Answer: b. Booking

Detailed Solution: The three phases of Bluetooth connection establishment are –

- Inquiry



- Paging
- Connection

See lecture 12 (Connectivity Technologies-IV) @ 05:33

QUESTION 9:

Zwave can support _____ number of nodes in a network?

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- 232
- 233
- 234
- 235

Correct Answer: a. 232

Detailed Solution: In Zwave, mesh network topology is the main mode of operation, and can support 232 nodes in a network.

See lecture 13 (Connectivity Technologies-V) @ 03:54

QUESTION 10:

Topologies allowed in ISA 100.11A are?

- Ring Only
- Mesh and Hybrid
- Mesh and Ring
- Mesh and Star/Tree

Correct Answer: d. Mesh and Star/Tree

Detailed Solution: The ISA 100.11A support the Mesh and Star/Tree topologies.

See lecture 13 (Connectivity Technologies-V) @ 15:44

QUESTION 11:

An example of an Operating System (OS) that a sensor node can have is?

- MicronOS
- TinyOS
- Both (a) and (b)
- None of these

Correct Answer: b. TinyOS

Detailed Solution: Sensor nodes can have OS such as TinyOS.

See lecture 14 (Sensor Networks-I) @ 12:06



QUESTION 12:

Which of the following is NOT a constraint on sensor nodes?

- a. Must consume extremely low power
- b. Be non-autonomous
- c. Be adaptive to environment
- d. None of these

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Correct Answer: b. Be non-autonomous

Detailed Solution: Constraints on sensor nodes –

- Must consume extremely low power
- Be autonomous
- Be adaptive to the environment

See lecture 14 (Sensor Networks-I) @ 14:36

QUESTION 13:

Nodes in WSNs that exhibit features of failed nodes but they can also send false routing messages which are a threat to the integrity of the network are called?

- a. Normal Nodes
- b. Badly Failed Nodes
- c. Failed Nodes
- d. Selfish Nodes

Correct Answer: b. Badly Failed Nodes

Detailed Solution: Nodes in WSNs that exhibit features of failed nodes but they can also send false routing messages which are a threat to the integrity of the network are called Badly Failed Nodes.

See lecture 15 (Sensor Networks-II) @ 03:53

QUESTION 14:

Which of the following are the two popular schemes to re-establish the connectivity between dumb nodes with others?

- a. CoARD and CoRD
- b. CoRAD and CoARD
- c. CoRD and CoRAD
- d. None of these



Correct Answer: c. CoRD and CoRAD

Detailed Solution: CoRD and CoRAD are the two popular schemes to re-establish the connectivity between dumb nodes with others.

See lecture 15 (Sensor Networks-II) @ 09:20

QUESTION 15:

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Full form of WBAN is?

- a. Wireless Body Area Network
- b. Wirelessness Body Area Network
- c. Wireless Bodily Area Network
- d. None of these

Correct Answer: a. Wireless Body Area Network

Detailed Solution: Wireless Body Area Network (WBAN).

See lecture 15 (Sensor Networks-II) @ 21:21

*****END*****



**Introduction to
Internet of Things
Assignment-Week 4**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

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QUESTION 1:

When an intruder enters into the agricultural field through the boundary (perimeter) of the field, a/an _____ sensor can be used to detect the object and a/an _____ sensor can be used to sense the distance at which the object is located.

- a. PIR, Ultrasonic
- b. Ultrasonic, PIR
- c. Humidity, PIR
- d. None of these

Correct Answer: a. PIR, Ultrasonic

Detailed Solution: When an intruder enters into the agricultural field through the boundary (perimeter) of the field, a PIR sensor can be used to detect the object and an Ultrasonic sensor can be used to sense the distance at which the object is located.

See lecture 16 (Sensor Networks-III) @ 15:40

QUESTION 2:

_____ is defined as, all the nodes are connected in the network, so that sensed data can reach to sink node?

- a. Coverage
- b. Connectivity
- c. Both (a) and (b)
- d. None of these

Correct Answer: b. Connectivity

Detailed Solution: Connectivity is defined as, all the nodes are connected in the network, so that sensed data can reach to sink node.

See lecture 17 (Sensor Networks-IV) @ 02:14



QUESTION 3:

The objective of coverage in WSN is.

- a. To use a minimum number of sensors and maximize the network lifetime
- b. To use a maximum number of sensors and maximize the network lifetime
- c. To use a minimum number of sensors and minimize the network lifetime
- d. To use a maximum number of sensors and minimize the network lifetime

Correct Answer: a. To use a minimum number of sensors and maximize the network lifetime

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

See lecture 17 (Sensor Networks-IV) @ 08:48

QUESTION 4:

State True or False

Statement-I: If transmission range $\leq 2^*$ sensing range, coverage implies connectivity.

- a. Statement-I is True
- b. Statement-I is False

Correct Answer: b. Statement-I is False

Detailed Solution: If transmission range $\geq 2^*$ sensing range, coverage implies connectivity.

See lecture 17 (Sensor Networks-IV) @ 05:46

QUESTION 5:

A mobile entity that collects the data from sensor nodes goes to the sink, and delivers the collected data from different sensor nodes are called?

- a. Data Molecule
- b. Static Node
- c. Data Mules
- d. None of these

Correct Answer: c. Data Mules

Detailed Solution: A mobile entity that collects the data from sensor nodes goes to the sink, and delivers the collected data from different sensor nodes are called Data Mules.

See lecture 18 (Sensor Networks-V) @ 07:11



QUESTION 6:

Human-centric Sensing is possible because of?

- Smartphone and PDAs
- Miniaturization and Proliferation of devices
- Both (a) and (b)
- None of these

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

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Detailed Solution: Human-centric Sensing is possible because of Smartphone, PDAs, Miniaturization, and Proliferation of devices.

See lecture 18 (Sensor Networks-V) @ 10:51

QUESTION 7:

Which of the following are the roles played by humans in Human-centric Sensing?

- Sensing Targets
- Sensor Operators
- Data Source
- All of these

Correct Answer: d. All of these

Detailed Solution: The three distinct roles (not necessarily mutually exclusive) played by humans are –

- Sensing Targets
- Sensor Operators
- Data Source

See lecture 18 (Sensor Networks-V) @ 12:35

QUESTION 8:

Which of the following is/are NOT goal of Participatory Sensing?

- To only collect data
- Not just collect data, but allow common people to access data and share knowledge
- To only access data
- Both (a) and (c)

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

Detailed Solution: The goal of Participatory Sensing is not just collect data, but allow common people to access data and share knowledge.

See lecture 18 (Sensor Networks-V) @ 13:00



QUESTION 9:

The two popular network topologies in UAV networks are

- a. Ring
- b. Mesh and Star
- c. Bus
- d. All of these

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Correct Answer: b. Mesh and Star

Detailed Solution: The two popular network topologies in UAV networks are Mesh and Star topologies.

See lecture 19 (UAV Networks) @ 03:26

QUESTION 10:

Which of the following is NOT an issue in UAV networks?

- a. Slow change in network topology
- b. Malfunctioning of UAVs
- c. Intermittent link nature
- d. Relative position of UAV may change

Correct Answer: a. Slow change in network topology

Detailed Solution: Key issues in UAV networks are –

- Frequently change in network topology
- Relative position of UAV may change
- Malfunctioning of UAV
- Intermittent link nature

See lecture 19 (UAV Networks) @ 05:23

QUESTION 11:

The scalability in single UAV system as compared to multi-UAV system is?

- a. Limited
- b. High
- c. Very High
- d. None of these

Correct Answer: a. Limited



Detailed Solution: The scalability in single UAV system as compared to multi-UAV system is limited.

See lecture 19 (UAV Networks) @ 07:47

QUESTION 12:

Typical types of mesh networks in UAV networks are

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- a. Solid Mesh and Hierarchical Mesh
- b. Plane Mesh and Solid Mesh
- c. Flat Mesh and Hierarchical Mesh
- d. None of these

Correct Answer: c. Flat Mesh and Hierarchical Mesh

Detailed Solution: Typical types of mesh networks in UAV networks are –

- Flat Mesh
- Hierarchical Mesh

See lecture 19 (UAV Networks) @ 12:48

QUESTION 13:

State True or False

Statement-I: SCADA is designed for isolated systems using proprietary solutions, whereas M2M is designed for cross-platform integration.

- a. False
- b. True

Correct Answer: b. True

Detailed Solution: SCADA is designed for isolated systems using proprietary solutions, whereas M2M is designed for cross-platform integration.

See lecture 20 (Machine to Machine Communication) @ 5:25



QUESTION 14:

Which of the following is NOT a feature of M2M?

- a. Large number of nodes or devices
- b. High cost
- c. Energy efficient
- d. Small traffic per machine/device

Correct Answer: b. High cost

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Detailed Solution: Features of M2M –

- Large number of nodes or devices
- Low cost
- Energy efficient
- Small traffic per machine/device

See lecture 20 (Machine to Machine Communication) @ 9:24

QUESTION 15:

Which of the following is NOT an M2M node type?

- a. Low End Node
- b. High End Node
- c. Out End Node
- d. None of these

Correct Answer: c. Out End Node

Detailed Solution: The three node types of M2M are –

- Low end node
- Mid end node
- High end node

See lecture 20 (Machine to Machine Communication) @ 10:35

*****END*****



**Introduction to
Internet of Things**

Assignment-Week 5

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

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QUESTION 1:

Suppose that an IoT sensor node A works on wireless WiFi and senses pressure as a physical parameter in integer number, and another IoT node B operates on IEEE 802.15.4 Zigbee and senses humidity as a floating point (decimal) number. In this context, which among the following correctly describes the issues with the deployment.

- a. Heterogeneity
- b. Interoperability
- c. Both heterogeneity and interoperability
- d. Neither heterogeneity and interoperability

Correct Answer: c. Both heterogeneity and interoperability

Detailed Solution: Since the two sensors sense different parameters in different formats and communicates with different protocols, this is an issue of both heterogeneity and interoperability. Refer lecture 21 on introduction to interoperability

QUESTION 2:

RESTful web services are utilized for _____.

- a. Syntactic interoperability for device interaction
- b. Semantic interoperability for device interaction
- c. Both (a) and (b)
- d. None of the above

Correct Answer: a. Syntactic interoperability for device interaction

Detailed Solution: Service-oriented computing-based architecture, RESTful web services, open standard protocols (IEEE 802.15.4), and closed protocols (Z-wave) are the popular approaches utilized towards syntactic interoperability for device interaction.

See lecture 21 @ 17:40



QUESTION 3:

Which UMB interoperability component is responsible for converting physical devices into virtually abstracted ones?

- a. UMB Adaptor
- b. UMB Core
- c. UMB Hypervisor
- d. UMB Abstractor

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Correct Answer: a. UMB Adaptor

Detailed Solution: UMB-A is responsible for converting physical devices into virtually abstracted ones.
(Please refer Lecture 21@27:16)

QUESTION 4:

User interoperability is the interoperability problem between an user and _____.

- a. Another user
- b. Device
- c. Both user and device
- d. None of these

Correct Answer: b. Device

Detailed Solution: In user interoperability, the issue of interoperability is between the user and device.
Refer lecture 21, ppt No. 7, types of interoperability

QUESTION 5:

Which of the following is an open, global, multi-sector standard for efficient, accurate, flexible classification of products and services?

- a. eCl@ss
- b. UNSPSC
- c. EPC
- d. Both UNSPSC and EPC

Correct Answer: b. UNSPSC



Detailed Solution: UNSPC stands for United Nations Standard Products and Services Code. It is one of the device classification solutions. eCl@ss is the standard utilized for classification and clear description of cross-industry products. Electronic Product Code (EPC) is used to generate unique addresses for device identification. See lecture 21 @ 16:30

QUESTION 6:

What does the routing component in UMB-C use for routing the metadata messages?

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- a. Flow Table
- b. Routing Table
- c. Middleware Routing Table
- d. Middleware Flow Table

Correct Answer: c. Middleware Routing Table

Detailed Solution: UMB-C uses Middleware Routing Table for routing metadata messages among the devices. (Please refer Lecture 21 @ 28:16)

QUESTION 7:

Which among the following are components of an Arduino UNO Board?

- a. LED Power Indicator
- b. Digital I/O Pins
- c. Analog IN Pins
- d. All of these

Correct Answer: d. All of these

Detailed Solution: An Arduino UNO board contains several components, which also contain the ones listed above. Refer lecture 22 on Arduino Board details.

QUESTION 8:

The tool used to select a particular COM port for connecting Arduino to a serial connector is called a sketch.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Sketch in Arduino is the program that is coded in Arduino IDE. Refer lecture 22, ppt No. 9



QUESTION 9:

Which kind of conflict occur when different processing logic are applied to same IoT networked devices or applications?

- a. Semantic conflict.
- b. Syntactic conflict.
- c. System conflict.
- d. Device conflict.

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Correct Answer: a. Semantic conflict

Detailed Solution: Semantic conflict occurs when different processing logics are applied to same IoT networked devices or applications. See lecture 21@5:20

QUESTION 10:

Which of the following is TRUE for the sketch command given below?

`delay(3000);`

- a. Provides a delay of 3000 seconds
- b. Provides a delay of 3 seconds
- c. Provides a delay of 3000 nano seconds
- d. Provides a delay of 3000 simulation time

Correct Answer: b. Provides a delay of 3 second

Detailed Solution: As per the basics of Arduino programming.

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:

How many digital I/O pins are there in Arduino Uno.

- a. 14
- b. 54
- c. 11
- d. 16

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Correct Answer: a. 14

Detailed Solution: From the basics of Arduino Uno. Refer to the book: S. Misra, A. Mukherjee, and A. Roy, 2020. Introduction to IoT. Cambridge University Press.

QUESTION 13:

Servo motors that you connect to Arduino, are an example of

- a. Sensors
- b. Actuators
- c. Gateways
- d. Routers

Correct Answer: b. Actuators

Detailed Solution: Servo motors, along with other different types of motors are examples of Actuators in IoT network. Refer lecture 25 on Integration of Arduino with Sensors and Actuators.

QUESTION 14:

Which of the following functions exist by default in Arduino IDE?

- a. main()
- b. loop() and main()
- c. setup() and loop()
- d. setup() and main()



Correct Answer: c. setup() and loop()

Detailed Solution: By default Arduino IDE consists of 2 functions - setup() and loop(). See lecture 22 @ 10:40

QUESTION 15:

Choose the right option for if/conditional operator.

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- 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)

*****END*****



Introduction to

Internet of Things

Assignment-Week 6

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

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QUESTION 1:

Python's installation comes with an integrated development environment for programming.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: As per Python program. (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 3:40)

QUESTION 2:

Fill in the blanks. Python IDE is available for installation into PC with _____.

- a. Windows
- b. Linux
- c. Mac
- d. All of these

Correct Answer: d. All of these

Detailed Solution: As per Python program. (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 4:50)



QUESTION 3:

How many data type/s are available in Python?

- a. 1
- b. 2
- c. 5
- d. None of these

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Correct Answer: c. 5

Detailed Solution: As per Python program (Please refer to lecture INTRODUCTION TO RASPBERRY PI-I @ 9:00).

QUESTION 4:

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

```
ls= {1: "abc", "key": "2", "year": 2023}
print(ls["key"])
```

- a. abc
- b. 2
- c. 2023
- d. “abc”

Correct Answer: b. 2

Detailed Solution: As per the basics of Python programming. (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 15:23)



QUESTION 5:

The variable that is declared inside the function in Python is called a Global variable.

- a. True
- b. False

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Correct Answer: b. False

Detailed Solution: As per the basics of Python programming. (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 25:58)

QUESTION 6:

Which of the following is used to read a text file in Python?

- a. file = open('data.txt ', 'r ')
- b. file = open_text('data.txt ', 'r ')
- c. file = read_text('data.txt ', 'r ')
- d. file = read('data.txt ', 'r ')

Correct Answer: a. file = open('data.txt ', 'r ')

Detailed Solution: As per the basics of Python programming. (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @)



QUESTION 7:

Which of the following libraries in Python is used for processing images.

- a. Pillow
- b. Numpy
- c. Panda
- d. None of these

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Correct Answer: a. Pillow

Detailed Solution: In python programming PIL, OpenCV, Pillow are common image processing libraries. (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @ 18:08)

QUESTION 8:

In python, images cannot be converted to greyscale.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: As per the basics of Python programming (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @19:44).



QUESTION 9:

Which of the following shortcut exits the nano editor?

- a. Ctrl + E
- b. Ctrl + O
- c. Ctrl+V
- d. None of these

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Correct Answer: d. None of these

Detailed Solution: Ctrl + O writes the code to a file. Ctrl + X exits the nano editor.
See lecture 29

QUESTION 10:

Which of the following is an unordered data type in Python?

- a. List
- b. Dictionary
- c. Both List and Dictionary
- d. Tuple

Correct Answer: b. Dictionary

Detailed Solution: As per basics of Python programming.
See lecture 26 @ 15:36



QUESTION 11:

Sensors can be analog or digital. Is the statement true?

- a. Yes
- b. No

Correct Answer: a. Yes

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Detailed Solution: Sensors can be analog or digital. See lecture 30 @ 03:27

QUESTION 12:

Is relay a type of mechanical switch?

- a. No
- b. Yes

Correct Answer: b. Yes

Detailed Solution: Relay is a type of mechanical/electromechanical switch. See lecture 30 @ 05:53



QUESTION 13:

Which of the following converts energy to motion?

- a. Actuator
- b. Raspberry Pi
- c. Sensor
- d. None of these

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Correct Answer: a. Actuator

Detailed Solution: Actuator converts energy to motion.

See lecture 30 @ 03:37

QUESTION 14:

Python does not follow strict indentation.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: As per the basics of Python programming. (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 7:47)



QUESTION 15:

Functions cannot be reassigned to the variables in Python.

- a. True
- b. False

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Correct Answer: b. False

Detailed Solution: As per the basics of Python programming. (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 24:54)

*****END*****



**Introduction to
Internet of Things**

Assignment-Week 7

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

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QUESTION 1:

The switches in a non-Software Defined Network (SDN) environment do not have a global view of the network.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: Switches in non-SDN do not have global view of the network. (Please refer Lecture 33@6:53)

QUESTION 2:

Which of the following is not a function of the Application Plane in Software Defined Network architecture?

- a. Business Logic implementation
- b. Security
- c. Traffic Engineering
- d. Forwarding

Correct Answer: d. Forwarding

Detailed Solution: The Data Plane in SDN is responsible for data forwarding. (Please refer Lecture 33@12:25)



QUESTION 3:

In Socket programming, the parameter AF_INET stands for _____.

- a. Unix protocols
- b. Internet Protocol (IP)
- c. File sharing
- d. Time slicing

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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:

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 5:

Fill in the blank:

Controllers in SDN receive requests from the _____.

- a. Repeaters
- b. Gateways
- c. Switches
- d. Routers

Correct Answer: c. Switches



Detailed Solution: SDN controllers should be able to handle all requests from the SDN switches (Please refer Lecture 34@2:41)

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:

With respect to client-server model of socket programming, in which of the following does the function <socket_name>.bind() reside?

- a. Client
- b. Server
- c. Both client and server
- d. None of client and server

Correct Answer: b. Server

Detailed Solution: The bind() function binds the socket name to the socket connection at the server side (Refer lecture 31 on socket programming)

QUESTION 8:

Which among the following are valid data processing activities

- a. Data Splitting
- b. Data filtering
- c. Data plotting
- d. All of the given

Correct Answer: d. All of the given

Detailed Solution: As per the basics of Python programming (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @19:44).



QUESTION 9:

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

- a. From controller to switch
- b. From switch to controller
- c. Between two switches
- d. Between two controllers

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Correct Answer: b. From switch to controller

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

QUESTION 10:

Suppose a particular flow-rule has a soft time-out of 5s and a hard time-out of 3s. Is this association correct?

- a. Yes
- b. No

Correct Answer: b. No

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:

In SDN Backup Controllers are required for which among the following?

- a. To act as backup of the main controller all the time
- b. To act as backup when the main controller fails
- c. To replace the main controller all together
- d. None of the stated.

Correct Answer: b. To act as backup when the main controller fails



Detailed Solution: Backup controllers acts as backup when the main controller is down Refer lecture 34.

QUESTION 12:

Which of the following is true?

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- 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 13:

What are the benefits of using SDN over IoT?

- a. Management of device heterogeneity
- b. Management of end-device mobility and dynamic flow rules
- c. Software control of end-devices, i.e sensors and actuators
- d. All of the given

Correct Answer: d. All of the given

Detailed Solution: SDN over IoT can be used to solve a plethora of issues and problems in a dynamic and efficient manner. Refer lecture 35, SDN over IoT



QUESTION 14:

Sensor OpenFlow, Soft-WSN and SDN-WISE are examples of _____.

- a. Traditional routing protocols.
- b. Various SDN protocols for wired LANs
- c. Various implementations of the concept of Software Defined IoT
- d. Traditional IoT protocol examples.

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Correct Answer: c. Various implementations of the concept of Software Defined IoT

Detailed Solution: The given names are all examples of various implementations of different concepts of Software Defined IoT by various research groups across the world. (Please refer Lecture 35@8:46 onwards)

QUESTION 15:

Consider the following python script using the split() function, what will be the correct print output (SEE the options VERY carefully including the quotation marks)

```
dat = 'Apple,Guava#Banana'  
var = dat.split('#')  
print(var)
```

- a. ['Apple','Guava','Banana']
- b. ['Apple','Guava']
- c. ['Guava','Banana']
- d. ['Apple,Guava','Banana']

Correct Answer: d. ['Apple,Guava','Banana']

Detailed Solution: The split('#') method splits the string into two parts with respect to the '#' character. (Please refer Lecture 32@8:02)

*****END*****



**Introduction to
Internet of Things
Assignment-Week 8**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

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QUESTION 1:

Which among the following are core challenges of traditional mobile networks?

- a. Scalability
- b. Flexibility
- c. Manageability
- d. All of the given

Correct Answer: d. All of the given

Detailed Solution: Traditional mobile networks suffer from a lot of problems, few of which are as given in the options. Refer lecture 36, Traditional (Wireless) Mobile Network

QUESTION 2:

Network virtualization enables _____ of physical resources

- a. Movement
- b. Abstraction
- c. Removal
- d. Creation

Correct Answer: b. Abstraction

Detailed Solution: Abstraction of physical resources from network services is one of the core functionality of virtualization. Refer lecture 36, ppt No. 5

QUESTION 3:



In comparison to Software-Defined Networks, traditional networks are cost expensive with respect to which of the following?

- a. Both capex and opex
- b. Capex but not opex
- c. Opex but not capex
- d. Neither capex nor opex

Correct Answer: a. Both capex and opex.

Detailed Answer: Traditional networks are cost expensive with respect to both capex and opex in comparison to SDN. (Please refer Lecture 36@2:46)

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QUESTION 4:

General OpenFlow supports both wireless and wired connections.

- a. True
- b. False

Correct Answer: b. False

Detailed Answer: A modified OpenFlow is necessary for supporting wireless connections. (Please refer Lecture 36@8:18)

QUESTION 5:

With respect to Software Defined Data Centre Networking (SD-DCN), _____ can use wild cards and _____ uses exact match rules.

- a. Mice flows, Elephant flows
- b. Elephant flows, Mice flows
- c. Mice flows, traditional flows
- d. Traditional flows, Elephant flows

Correct Answer: a. Mice flows, Elephant flows

Detailed Solution: Refer to ppt No. 19 of lecture 36 on Data Centre Networking

QUESTION 6:



In cloud computing model, which among the following are characteristics of computing resources?

- a. On-demand
- b. Shared
- c. Configurable
- d. All of these

Correct Answer: d. All of these

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Detailed Solution: “Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., network infrastructures, servers, storage, applications, etc.)” – NIST. Refer Lecture 37, Introduction to Cloud Computing.

QUESTION 7:

IaaS, PaaS and SaaS are examples of what type of cloud models?

- a. Cloud deployment model
- b. Cloud service model
- c. Cloud access model
- d. Cloud virtualization model

Correct Answer: b. Cloud service model

Detailed Solution: IaaS, PaaS and SaaS are three major types of cloud service models. Refer lecture 37, Introduction to Cloud Computing

QUESTION 8:

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 9:

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

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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 10:

Fill in the blank: Typically, cloud computing have _____ components?

- a. 4
- b. 5
- c. 6
- d. 7

Correct Answer: c. 6

Detailed Answer: Cloud computing has 6 components. They are clients, services, applications, platforms, storage, and infrastructure. (Please refer Lecture 37@23:31)

QUESTION 11:

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 12:

In SaaS model of cloud computing, which of the following acts as the thin-client?

- a. Cloud gateway
- b. Web monitor
- c. Web browser
- d. Local firewall

Correct Answer: c. Web browser

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Detailed Solution: Web browsers at the client side act as thin-clients which makes connection to the cloud to receive the services provided by the SaaS model. Refer lecture 38 on SaaS, ppt No. 21.

QUESTION 13:

Data in _____ and Data at _____ are two important aspects of data security

- a. past, present
- b. time, place
- c. transit, rest
- d. None of these

Correct Answer: c. transit, rest

Detailed Solution: Data in transit and Data at rest are two important aspects of data security within cloud computing framework. Refer lecture 39 on Data Security, ppt No. 18

QUESTION 14:

Which among the following is a metric for Service Level Agreement (SLA) in Cloud Computing?

- a. Availability
- b. Portability
- c. Response Time
- d. All of these

Correct Answer: d. All of these

Detailed Solution: Availability, Portability, Response Time, Problem Reporting and Penalty are various SLA metrics for Cloud Computing. Refer Chapter 10 (Page 245) of “Introduction to IoT” by Sudip Misra, Anandarup Mukherjee, Arijit Roy, Cambridge University Press.

QUESTION 15:



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Which of the following cloud computing models does AWS EC2 belong to?

- a. IaaS
- b. PaaS
- c. SaaS
- d. None of these

Correct Answer: a. IaaS.

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Detailed Solution: AWS EC2 is a popular example of IaaS.

*****END*****



**Introduction to
Internet of Things**

Assignment-Week 9

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

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QUESTION 1:

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 2:

Which among the following is NOT a component of OpenStack.

- a. Horizon
- b. Heat
- c. Plasma
- d. Neutron

Correct Answer: c. Plasma

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



QUESTION 3:

You cannot ping your OpenStack instance from an outside network unless you connect your instance with the public network through a _____

- a. Router
- b. Firewall
- c. Repeater
- d. Load balancer

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Correct Answer: a. Router

Detailed Solution: You are supposed to connect your virtual OpenStack instance with the public network through a router (Please refer Lecture 41@17:41)

QUESTION 4:

Virtualized resources within the OpenStack simulator that you can define, set parameters of and deploy within OpenStack are also known as

- a. Instances
- b. Files
- c. Hypervisors
- d. Sketches

Correct Answer: a. Instances

Detailed Solution: In OpenStack instances refer to the virtual resources that you define, initialize and deploy. Refer Lecture 41@15:36

QUESTION 5:

The SCSP in sensor clouds is responsible for caching the data in the databases.

- a. True
- b. False

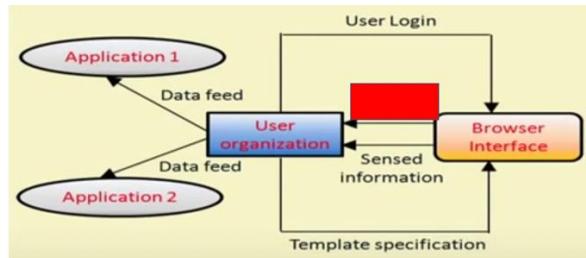
Correct Answer: a. True

Detailed Answer: The SCSP in sensor clouds is responsible for caching the data in the databases. (Please refer Lecture 42@14:25)

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QUESTION 6:

Select the correct option for replacing the box (in red) in the following architecture for sensor cloud user organization view.



- a. User credentials
- b. Template display
- c. Template view
- d. User view

Correct Answer: c. Template view

Detailed Solution: The browser interface sends template view and sensed information to the user organization module in the sensor cloud user organization view. (Please refer Lecture 42@15:16)

QUESTION 7:

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: Sensor virtualization is the principal feature of sensor clouds and their utility.



Refer lecture 42 and 43 on Sensor cloud

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QUESTION 8:

Caching in sensor cloud provide no benefit over regions with slow environmental monitoring rate.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: To prevent unnecessarily energy wastage in continuous sensing operation, sensor cloud uses caching. Refer lecture 42 and 43.

QUESTION 9:

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 10:

Virtual sensors within a sensor cloud have communication interfaces with _____.

- a. Only the physical sensors below them
- b. Only the end-user applications above them.
- c. Both physical sensors below and applications above.
- d. Neither the physical sensors, nor the applications above.



Correct Answer: c. Both physical sensors below and applications above

Detailed Solution: Virtual sensor layer sits in the middle having interface to both physical sensors as well as applications. (Please refer Lecture 3@9:24 and 28:01)

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QUESTION 11:

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 12:

In IoT, temporal sensitivity of data plays an important role

- a. True
- b. False

Correct Answer: a. True

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 13:

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Extremely time sensitive data in IoT should be processed and analyzed _____.

- a. Farthest away from source
- b. Closest to the source
- c. Distance between source and place of analysis does not matter
- d. None of these

Correct Answer: b. Closest to the source

Detailed Solution: Extremely time sensitive data should be processed and analyzed closest to the source, so that prompt action can be taken immediately. Refer lecture 44 on Fog Computing, ppt No. 17.

QUESTION 14:

Which among the following is a view of a Fog Computing Architecture?

- a. Node View
- b. System View
- c. Software View
- d. All of these

Correct Answer: d. All of these

Detailed Solution: Fog Computing Architectural framework has several views, node, system and software among them. Refer Chapter 11 (Page 260 - 263) of “Introduction to IoT” by Sudip Misra, Anandarup Mukherjee, Arijit Roy, Cambridge University Press.



QUESTION 15:

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).

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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)

*****END*****



**Introduction to
Internet of Things
Assignment-Week 10**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1 = 15

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QUESTION 1:

A smart city _____.

- a. Is an urban system
- b. Uses ICT
- c. Makes infrastructure more reliable
- d. All of these

Correct Answer: d. All of these

Detailed Solution: A smart city is an urban system, uses ICT and makes infrastructure more reliable. (Please refer Lecture 46@8:29)

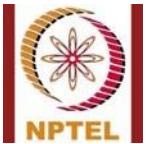
QUESTION 2:

Collective data is more intelligent than the single sources.

- a. True
- b. False

Correct Answer: a.

Detailed Solution: Collective data is rich in information and generates better intelligence than the single sources. (Please refer Lecture 47@10:18)



QUESTION 3:

Which of the following is one of the challenges of Data fusion?

- a. Imperfection
- b. Conflicts
- c. Ambiguity
- d. All of these

Correct Answer: d. All of these

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Detailed Solution: The challenges of data fusion involves Imperfection, Conflicts and Ambiguity. (Please refer Lecture 47@9:16)

QUESTION 4:

Which of the following are challenges for IoT in smart cities?

- a. Security and Reliability
- b. Small scale
- c. Homogeneity
- d. None of these

Correct Answer: a. Security and Reliability

Detailed Solution: Security and Reliability are two challenges of IoT in smart cities. (Please refer Lecture 46 @32:28)



QUESTION 5:

Fill in the blank.

_____ combines information from multiple sensors.

- a. Data storage
- b. Data cleaning
- c. Data fusion
- d. None of these

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Correct Answer: c. Data fusion

Detailed Solution: Data fusion combines information from multiple sensors. (Please refer Lecture 47 @6:36)

QUESTION 6:

Which of the following are the functional layers in smart parking?

- a. Information collection
- b. System Deployment
- c. Service Dissemination
- d. All of these

Correct Answer: d. All of these

Detailed Solution: Information collection, System Deployment and Service Dissemination are the three functional layers in smart parking (Please refer Lecture 47@17:25)



QUESTION 7:

Which of the following statements are true about the different components present in a smart home?

Statement I: Sensor networks and communication network infrastructure

Statement II: Intelligent control and management

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Statement III: Manual instead of automatic access of devices

- 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: The different components of smart home include communication network infrastructure, Intelligent control and management, Sensor networks, smart features and automatic response. (Please refer Lecture 48@7:04)

QUESTION 8:

Which of the following are included in the Service Dissemination in smart parking?

Statement I: Dynamic Pricing

Statement II: Infrastructure-free and infrastructure-based information

Statement III: Parking Choice

- a. Statement I and II
- b. Statement II and III
- c. Statement I and III
- d. Statement I, II and III

Correct Answer: d. Statement I, II and III

Detailed Solution: Service Dissemination in smart parking includes Dynamic Pricing, parking choice and infrastructure-free information and infrastructure-based information. (Please refer Lecture 47@19:07)



QUESTION 9:

Fill in the blank.

_____ is a network contained within a home.

- a. Local area network
- b. Home area network
- c. Personal area network
- d. Metropolitan area network

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Correct Answer: b. Home area network

Detailed Solution: Home area network is a network contained within a home (Please refer Lecture 48@8:38)

QUESTION 10:

Fill in the blank. In Vehicle-to-Human / Human-to-Vehicle interaction, the human communicating with the vehicle _____.

- a. Is present in another vehicle
- b. Is present in the same vehicle
- c. Is present outside the vehicle on the roadside
- d. All of these

Correct Answer: c. Is present outside the vehicle on the roadside

Detailed Solution: In V2H/H2V, the human is present outside the vehicle on the roadside. (Please refer Lecture 49@3:13)



QUESTION 11:

Wired HAN provides easy integration with pre-existing house infrastructure.

- a. True
- b. False

Correct Answer: a. True

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Detailed Solution: Wired HAN provides easy integration with pre-existing house infrastructure like existing telephone systems, cables and so on (Please refer Lecture 48@10:20)

QUESTION 12:

Which of the following statement(s) is/are true about Konnex?

- a. Utilizes only short ranges in home
- b. Can be used before configuration
- c. Does not have standards for building networks
- d. None of these

Correct Answer: d. None of these

Detailed Solution: The Konnex is an important standard for home and building networks. It utilizes full range of home communication. It must be setup and configured before its proper usage (Please refer Lecture 48@14:41)



QUESTION 13:

Which of the following is the reason for failures of TCP/IP in V2X?

- a. TCP/IP handles information exchange between multiple pair of entities
- b. The increase in the number of wireless devices restricts the mobility
- c. TCP/IP can identify the addresses of the endpoints
- d. Information exchange does not depend on the location of the data

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Correct Answer: b. The increase in the number of wireless devices restricts the mobility

Detailed Solution: The increase in the number of wireless devices restricts the mobility is one of the reasons of the failures of TCP/IP in V2X (Please refer Lecture 49@13:09)

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:

What are the disadvantages of V2X communication?

- a. Increased traffic safety
- b. Tracking of movement
- c. Efficient use of fuel
- d. None of these

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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)

*****END*****



**Introduction to
Internet of Things
Assignment-Week 11**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1 = 15

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QUESTION 1:

Which of the following is not done in traditional electrical grids?

- a. Manual energy monitoring
- b. Unidirectional energy distribution
- c. Unidirectional communication
- d. Distributed power plants

Correct Answer: d. Distributed power plants

Detailed Solution: In Traditional electrical grids, the energy generation is done in centralized power plants. (Please refer Lecture 51@5:45)

QUESTION 2:

Smart Grid is also named as—

- a. Electronet
- b. Energy service
- c. Grid with a brain
- d. Smart internet

Correct Answer: a. Electronet

Detailed Solution: Electronet is another name for smart grids (Please refer Lecture 51@7:41)



QUESTION 3:

Which of the following is not a property of smart grids?

- a. Bidirectional flow of energy
- b. Two-way communication
- c. Unreliable and insecure electricity
- d. Control Capabilities

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Correct Answer: c. Unreliable and insecure electricity

Detailed Solution: Smart Grids uses information technology to deliver electricity efficiently, reliably and securely (Please refer Lecture 51@7:41)

QUESTION 4:

Which of the following is the benefit of using Smart Grids for stakeholders?

- a. Reduces inefficiencies in energy delivery
- b. Different pricing options
- c. Lower Energy bills
- d. All of these

Correct Answer: a. Reduces inefficiencies in energy delivery

Detailed Solution: The smart grids reduce inefficiencies in energy delivery. This is one of the benefits for stakeholders. The other benefits are for the customers (Please refer Lecture 51 @18:28)



QUESTION 5:

Fill in the blank.

_____ samples voltage and current with a fixed sample rate at the installed location.

- a. PEVs
- b. DAUs
- c. PMUs
- d. None of these

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Correct Answer: c. PMUs

Detailed Solution: PMUs or Phasor Measurement Unit samples voltage and current with a fixed sample rate at the installed location (Please refer Lecture 52 @2:44)

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 statements are true about MDMSs?

- Statement I: Decide the price per unit energy to be paid by the customers
- Statement II: Handled by the energy service providers
- Statement III: Aggregate the energy consumption or energy request of certain geographical area
- a. Statements I and II
 - b. Statements I and III
 - c. Statements II and III
 - d. Statements I, II and III

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Correct Answer: a. Statements I and II

Detailed Solution: The Meter Data Management Systems (MDMS) decide the price per unit energy to be paid by the customers AND are handled by the energy service providers. (Please refer Lecture 52@16:02)

QUESTION 8:

Which of the following are included in the Smart Grid security issues of integrity?

- Statement I: System Damage
- Statement II: Data injection attacks
- Statement III: Time synchronization attacks
- a. Statement I and II
 - b. Statement II and III
 - c. Statement I and III
 - d. Statement I, II and III

Correct Answer: d. Statement I, II and III

Detailed Solution: System Damage, data injection attacks and time synchronization attacks are the types of integrity issues in Smart Grids (Please refer Lecture 52@18:55)



QUESTION 9:

Fill in the blank.

_____ is a primary challenge in IIoT.

- a. Worker health and safety
- b. Optimized operations
- c. Regulatory compliance
- d. Integrating existing infrastructure into new IIoT infrastructure

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Correct Answer: d. Integrating existing infrastructure into new IIoT infrastructure

Detailed Solution: Integrating existing infrastructure into new IIoT infrastructure is one of the primary challenges of IIoT. (Please refer Lecture 54@14:02)

QUESTION 10:

Fill in the blank. Rt Tech particularizes in software which _____.

- a. Improves industrial facilities' efficiency
- b. Improves productivity
- c. Automates managing of energy consumption
- d. All of these

Correct Answer: d. All of the these

Detailed Solution: Rt Tech improves industrial facilities efficiency and productivity. It automates the process of mapping and managing energy consumption (Please refer Lecture 54@20:30)



QUESTION 11:

Lack of vision and leadership is not a hindrance in the path of success of IIoT.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Lack of vision and leadership is one of the hindrances in the path of success of IIoT. (Please refer Lecture 54@18:44)

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QUESTION 12:

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 13:

Which of the following is a characteristic of Big Data?

- a. Veracity
- b. Variability
- c. Velocity
- d. All of these

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Correct Answer: d. All of these

Detailed Solution: Big Data is characterized by 7 Vs, Veracity, Variability and Velocity included (Please refer Lecture 55@10:41)

QUESTION 14:

Variety refers to the category to which the data belongs.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: Variety refers to the category to which the data belongs. Examples: Pure text, images, audio, etc. (Please refer Lecture 55@12:58)



QUESTION 15:

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

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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)

*****END*****



**Introduction to
Internet of Things
Assignment-Week 12**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1 = 15

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QUESTION 1:

Quantitative analysis does not involve descriptive statistics such as mean.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Quantitative analysis involves descriptive statistics such as mean, median and standard deviation. (Please refer Lecture 56@4:26)

QUESTION 2:

Fill in the blank.

To perform an ANOVA, we must have a _____ response variable and at least one _____ factor.

- a. Discrete, categorical
- b. Continuous, quantitative
- c. Discrete, quantitative
- d. Continuous, categorical

Correct Answer: d. Continuous, categorical

Detailed Solution: To perform an ANOVA, we must have a continuous response variable and at least one categorical factor. (Please refer Lecture 56@9:24)



QUESTION 3:

Select the statement(s) that denote the example of dispersion measure.

Statement I: Range, Variable and Standard deviation

Statement II: Range and average absolute deviation

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Statement III: Variance, Standard deviation and average absolute deviation

- 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 example of dispersion measure includes Range, Variable and Standard deviation and average absolute deviation (Please refer Lecture 56@13:36)

QUESTION 4:

The different components of AgriSens includes –

- a. Sensor and actuator unit
- b. Wireless communication unit
- c. Power management unit
- d. All of these

Correct Answer: d. All of these

Detailed Solution: The different components of AgriSens includes sensor and actuator unit, wireless communication unit, and power management unit. (Please refer Lecture 57@7:44)



QUESTION 5:

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

- a. Soil moisture and proximity sensor
- b. Soil moisture and water level sensor
- c. ECG sensor and water level sensor
- d. All of these

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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 6:

The sensor node of AgriSens sense the average soil moisture in _____.

- a. Vegetative phase
- b. Reproductive phase
- c. Maturity phase
- d. All of these

Correct Answer: d. All of these

Detailed Solution: The sensor node of AgriSens sensed the average soil moisture in vegetative phase, reproductive phase and maturity phase (Please refer Lecture 57@18:33)



QUESTION 7:

Select the correct order of the component layers present in the IoT healthcare.

- a. Sensing layer, cloud platform layer, aggregated layer, processing layer
- b. Sensing layer, aggregated layer, processing layer, cloud platform layer
- c. Aggregated layer, sensing layer, processing layer, cloud platform layer
- d. Sensing layer, processing layer, aggregated layer, cloud platform layer

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Correct Answer: b. Sensing layer, aggregated layer, processing layer, cloud platform layer

Detailed Solution: The sensing layer senses data and transmit it to the aggregation layer where the data are aggregated. The aggregated layer further transfers the data to the processing layer the data are processed and final sent to the cloud platform. (Please refer Lecture 58@8:25)

QUESTION 8:

Which of the following communication protocol is used in AmbuSens?

- a. IEEE 802.15.4
- b. 6LoWPAN
- c. IEEE 802.15.1
- d. IEEE 802.15.2

Correct Answer: c. IEEE 802.15.1

Detailed Solution: In AmbuSens, the communication protocol used is Bluetooth i.e., IEEE 802.15.1 (Please refer Lecture 58@22:09)



QUESTION 9:

Wireless IoT driven solutions for remote healthcare facility provisioning brings healthcare to patients than bringing patients to healthcare.

- a. True
- b. False

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Correct Answer: a. True

Detailed Solution: In IoT healthcare, wireless IoT driven solutions brings healthcare to patients than bringing patients to healthcare. (Please refer Lecture 58@11:40)

QUESTION 10:

Fill in the blank. The physical activity tracking is a necessary component for _____.

- a. Activity monitoring
- b. Vehicle monitoring
- c. Agriculture monitoring
- d. All of these

Correct Answer: a. Activity monitoring

Detailed Solution: The physical activity tracking is a necessary component for activity monitoring (Please refer Lecture 59@6:39)



QUESTION 11:

Which of the following handheld devices are used for activity monitoring?

- a. EEG and GPS
- b. Accelerometer and EEG
- c. Accelerometer and GPS
- d. All of these

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Correct Answer: c. Accelerometer and GPS

Detailed Solution: High end smartphones are likely to have accelerometer, compass, and gyroscope. (Please refer Lecture 59@15:29)

QUESTION 12:

Which of the following is the primary disadvantage of using camera-based activity tracking?

- a. Accurate
- b. Process intensive
- c. Expensive
- d. None of these

Correct Answer: b. Process intensive

Detailed Solution: Camera based activity tracking is very much process intensive. (Please refer Lecture 59@17:43)



QUESTION 13:

By performing continuous monitoring of a person's activity, it is not possible to observe his/her behavior or to identify any repetitive pattern in his/her day-to-day activity.

- a. True
- b. False

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Correct Answer: b. False

Detailed Solution: Continuous monitoring of activity results in daily observations of human behavior and repetitive patterns in their activity. (Please refer Lecture 59@14:33)

QUESTION 14:

Which of the following are the inbuilt sensors that are present in high end smartphones?

- a. ECG and EEG
- b. Accelerometer, proximity sensor, and EEG
- c. Accelerometer, Compass and Gyroscope
- d. Pressure sensor and NPK sensor

Correct Answer: c. Accelerometer, Compass, and Gyroscope

Detailed Solution: High end smartphones are likely to have accelerometer, compass, and gyroscope. (Please refer Lecture 60@2:28)



QUESTION 15:

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

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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)