



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

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1 = 15

QUESTION 1:

Which of the following is/are not a thing as per IoT?

- a. Fan
- b. Light
- c. Refrigerator
- d. None of the these

Correct Answer: d. None of the these

Detailed Solution: All of these are things as per IoT

See lecture 1 (Introduction to IoT – Part - I) @ 02:15

QUESTION 2:

State true or false.

Statement: The things in IoT consist of embedded systems.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: The things in IoT consist of embedded systems.

See lecture 1 (Introduction to IoT – Part - I) @ 04:15



QUESTION 3:

State whether the following statement is True or False.

Statement: IoT is one of the technologies that enable smart farms.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: IoT is one of the technologies that enable smart farms.

See lecture 2 (Introduction to IoT – Part - II) @ 05:27

QUESTION 4:

State whether the following statement is True or False.

Statement: In M2M, it is mandatory that the interactions between the machines and devices happen through a cloud computing infrastructure.

- a. True
- b. False**

Correct Answer: b. False

Detailed Solution: In M2M, the interactions between the machines and devices can happen through a cloud computing infrastructure.

See lecture 1 (Introduction to IoT – Part - I) @ 33:22



QUESTION 5:

Sometimes, when there is a need for the nodes to communicate directly to the Internet,
_____ can be used.

- a. Sensors
- b. Actuators
- c. Tunneling
- d. None of these

Correct Answer: c. Tunneling

Detailed Solution: Sometimes, there is a need for the nodes to communicate directly to the Internet. This is achieved by tunneling.

See lecture 2 (Introduction to IoT – Part - II) @ 11:44

QUESTION 6:

State whether the following statement is true or false.

Statement: In multi-homing a node/network is connected to only two networks for improved reliability.

- a. True
- b. False

Correct Answer: b. False

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

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



QUESTION 7:

Which of the following is/are not enablers of IoT?

- a. Advancement in gene sequencing
- b. Nanotechnology
- c. Sensors
- d. RFID

Correct Answer: a. Advancement in gene sequencing

Detailed Solution: The enablers of IoT are –

- a. RFID
- b. Nanotechnology
- c. Sensors

See lecture 1 (Introduction to IoT – Part - I) @ 12:41

QUESTION 8:

State whether the following statement is True or False.

Statement: The decreasing number of devices in IoT is expected to result in an address crunch.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: The increasing number of devices in IoT is expected to result in an address crunch.

See lecture 2 (Introduction to IoT – Part - II) @ 01:19



QUESTION 9:

Why IoT has become so popular?

- a. It can provide advanced level of services to the society
- b. It can help reduce human effort
- c. It can potentially make processes more efficient
- d. All of these

Correct Answer: d. All of these

Detailed Solution: IoT has become popular as –

- It can provide advanced level of services to the society
- It can help reduce human effort
- It can potentially make processes more efficient

See lecture 1 (Introduction to IoT – Part - I) @ 03:15

QUESTION 10:

State whether the following statement is true or false.

The resolution of a sensor is the maximum change it can detect in the quantity that it is measuring.

- a. False
- b. True

Correct Answer: a. Resolution

Detailed Solution: The resolution of a sensor is the smallest change it can detect in the quantity that it is measuring.

See lecture 3 (Sensing) @ 12:33

QUESTION 11:



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Transducer is a _____ term and includes _____.

- a. special, only sensors
- b. special, only actuators
- c. collective, both sensors and actuators
- d. None of these

Correct Answer: c. collective, both sensors and actuators

Detailed Solution: Transducer is a collective term and includes both sensors and actuators.

See lecture 3 (Sensing) @ 11:49

QUESTION 12:

Which of the following is/are feature/features of sensors?

- a. It is only sensitive to the measured property.
- b. It acts on the surrounding environment.
- c. Both (a) and (b)
- d. None of these

Correct Answer: a. It is only sensitive to the measured property.

Detailed Solution: It is only sensitive to the measured property. It does not influence the measure property and does not act on the surrounding environment.

See lecture 3 (Sensing) @ 12:17

QUESTION 13:

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 14:

What is the full form of IoT?

- a. Internet of Tasks
- b. Internet of Things
- c. Internet of Tracks
- 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 15:

A sensor node is not made up of which of the following?

- a. Sensor/Sensors
- b. A processing unit
- c. A power unit
- d. None of these

Correct Answer: d. None 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)

*****END*****



Introduction to Internet
of Things Assignment-
Week 2

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1 = 15

QUESTION 1:

The full form of MQTT is

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

Correct Answer: d. None of these

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:

Which of the following is NOT a method in MQTT?

- a. Break
- b. Stick
- c. Run
- d. All of these

Correct Answer: d. All of these

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 3:

Which of the following is/are component/components of MQTT?

- a. Publishers
- b. Subscribers
- c. Brokers
- d. All of these

Correct Answer: d. All of these

Detailed Solution: The three components of MQTT are –

- a) Publishers
- b) Subscribers
- c) Brokers

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

QUESTION 4:

State whether the following statement is true or false.

SMQTT is an extension of MQTT which uses lightweight attribute based encryption. It has three main stages.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: SMQTT is an extension of MQTT which uses lightweight attribute based encryption. It has four main stages.

See lecture 6 (Basics of IoT Networking – Part II) @ 13:45

QUESTION 5:

The OSI model has _____ layers.

- a. 6
- b. 8
- c. Both (a) and (b)
- d. None of these

Correct Answer: d. None of these

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



QUESTION 6:

The two sub-layers of CoAP are -

- a. Messaging and Holding
- b. Messaging and Backoff
- c. Messaging and Teardown
- d. None of these

Correct Answer: d. None of these

Detailed Solution: CoAP has two sub-layers which are –

- a) Messaging
- b) Request/response

See lecture 7 (Basics of IoT Networking – Part III) @ 04:44

QUESTION 7:

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

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

Correct Answer: d. None of these

Detailed Solution: AMQP stands for Advanced Message Queuing Protocol.

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

QUESTION 8:

XMPP uses the _____ architecture.

- a. Publish-subscribe
- b. Client-server
- c. Both (a) and (b)
- d. Neither (a) nor (b)

Correct Answer: b. Client-server

Detailed Solution: XMPP uses the client-server architecture.

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



QUESTION 9:

How many message delivery guarantee modes are there in the AMQP protocol?

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

Correct Answer: b. 3

Detailed Solution: There are three message delivery guarantee modes in the AMQP protocol.

- a. At-most-once
- b. At-least-once
- c. Exactly-once

See lecture 8 (Basics of IoT Networking – Part IV) @ 11:32

QUESTION 10:

Which of the following is/are NOT an AMQP frame type?

- a. Open
- b. Close
- c. Random
- d. None of these

Correct Answer: c. Random

Detailed Solution: Open, close, and end are valid frame types of the AMQP protocol.

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

QUESTION 11:

State whether the following statement is true or false.

Statement: IEEE 802.15.5 was developed for low data rate monitoring and control applications and extended life low power communication uses.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: IEEE 802.15.4 was developed for low data rate monitoring and control applications and extended life low power communication uses



See lecture 9 (Connectivity Technologies – Part-I) @ 04:15

QUESTION 12:

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

- a. Direct
- b. Indirect
- c. Both (a) and (b)
- d. None of these

Correct Answer: a. Direct

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:

State whether the following statement is True or False.

Statement: The IEEE 802.15.4 operates in ISM band.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: The IEEE 802.15.4 operates in the ISM band.

See lecture 9 (Connectivity Technologies – Part-I) @ 02:57



QUESTION 14:

The networking topologies supported in the IEEE 802.15.4 are -

- a. Only Star
- b. Star and Mesh
- c. Only Mesh
- d. None of these

Correct Answer: b. Star and Mesh

Detailed Solution: The networking topologies defined in IEEE 802.15.4 are star and mesh.

See lecture 9 (Connectivity Technologies – Part-I) @ 08:56

QUESTION 15:

State whether the following statement is True or False.

Statement: Generation of Route Requests (RREQs) by a LOADng Router for discovering a route to a destination is a valid operation of the LOADng routing protocol.

- a. False
- b. True

Correct Answer: b. True

Detailed Solution: Generation of Route Requests (RREQs) by a LOADng Router for discovering a route to a destination is a valid operation of the LOADng routing protocol.

See lecture 10 (Connectivity Technologies – Part-II) @ 12:40

*****END*****



Introduction to Internet
of Things Assignment-
Week 3

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1 = 15

QUESTION 1:

HART operates only in _____ GHz ISM band.

- a. 2.3
- b. 4.8
- c. Both (a) and (b)
- d. None of these

Correct Answer: d. None of these

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

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

QUESTION 2:

State whether the following statement is true or false.

Statement: The HART physical layer is derived from IEEE 802.15.4 protocol and operates only in 2.5 GHz ISM band.

- a. False
- b. True

Correct Answer: a. False

Detailed Solution: The HART physical layer is derived from IEEE 802.15.4 protocol and operates only in 2.4 GHz ISM band.

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



QUESTION 3:

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.

- 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 4:

_____ identifies channels consistently affected by interference and removes them from use.

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

Correct Answer: c. 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: The Network Manager supervises each node in the network and guides them on when and where to send packets.

- a. True
- b. False

Correct Answer: a. True

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:

Which layer of HART incorporates channel hopping and channel blacklisting?

- a. Surface Layer
- b. Troposphere
- c. Data Link Layer
- d. None of these

Correct Answer: c. Data Link Layer

Detailed Solution: HART Data Link Layer incorporates channel hopping and channel blacklisting.

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

QUESTION 7:

WirelessHART relies on _____ for its communication.

- a. Star networking
- b. Bus networking
- c. Both (a) and (b)
- d. None of these

Correct Answer: d. None of these

Detailed Solution: WirelessHART relies on mesh networking.

See lecture 11 (Connectivity Technologies-III) @ 08:39

QUESTION 8:

State whether the following statement is true or false.

NFC devices work on the principle of magnetic induction.

- a. True
- b. False

Correct Answer: b. False

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

See lecture 11 (Connectivity Technologies-III) @ 20:00



QUESTION 9:

Bluetooth technology is based on Ad-hoc technology also known as _____.

- a. Ad-hoc meshnet
- b. Ad-hoc Piconets
- c. Ad-hoc starnet
- d. None of these

Correct Answer: b. 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) @ 02:25

QUESTION 10:

State whether the following statement is true or false

Statement: Booking in Bluetooth is the process of forming a connection between two Bluetooth devices.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Paging in Bluetooth is the process of forming a connection between two Bluetooth devices.

See lecture 12 (Connectivity Technologies-IV) @ 05:32

QUESTION 11:

State whether the following statement is true or false.

Statement: Class 1 Bluetooth radios are used primarily in industrial use cases and have a range of 100 meters or 300 feet.

- a. True
- b. False

Correct Answer: a. True



Detailed Solution: Class 1 Bluetooth radios are used primarily in industrial use cases and have a range of 100 meters or 300 feet.

See lecture 12 (Connectivity Technologies-IV) @ 04:58

QUESTION 12:

Zwave uses _____ topology.

- a. Ring
- b. Star
- c. Mesh
- d. None of these

Correct Answer: c. Mesh

Detailed Solution: Zwave uses Mesh topology.

See lecture 13 (Connectivity Technologies-V) @ 2:51

QUESTION 13:

Which of the following is an OS for sensor nodes?

- a. MicroOS
- b. LiteOS
- c. TinyOS
- d. None of these

Correct Answer: c. TinyOS

Detailed Solution: TinyOS is an OS for sensor nodes.

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

QUESTION 14:

State whether the following statement is true or false.

Statement: Selfish nodes are typified by their unwillingness to cooperate, as the protocol requires whenever there is a personal cost involved.

- a. True
- b. False

Correct Answer: a. True



Detailed Solution: Selfish nodes are typified by their unwillingness to cooperate, as the protocol requires whenever there is a personal cost involved.

See lecture 15 (Sensor Networks-II) @ 05:14

QUESTION 15:

Dumb behavior of sensor nodes is _____ in nature (as it is dependent on the effects of the environmental conditions).

- a. Temporal
- b. Spatial
- c. Both (a) and (b)
- d. None of these

Correct Answer: a. Temporal

Detailed Solution: Dumb behavior of sensor nodes is Temporal in nature (as it is dependent on the effects of the environmental conditions).

See lecture 15 (Sensor Networks-II) @ 05:40

*****END*****



Introduction to

Internet of Things

Assignment-Week 4

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

QUESTION 1:

If transmission range $> 2 \times$ sensing range,

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

Correct Answer: d. None of these

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

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

QUESTION 2:

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. Astronomical Underwater Vehicle
- d. None of these

Correct Answer: d. None of these

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

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



QUESTION 3:

State whether the following statement is true or false.

Statement: Agricultural intrusion detection uses NFC sensors.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Agricultural intrusion detection uses PIR and Ultrasonic sensors.

See lecture 16 (Sensor Networks-III) @ 13:22

QUESTION 4:

The objective of coverage in WSN is to use a _____ number of sensors and _____ the network lifetime.

- a. minimum, minimize
- b. maximum, minimize,
- c. maximum, maximize
- d. None of these

Correct Answer: d. None of these

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

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

QUESTION 5:

WSN in agriculture uses what for processing?

- a. Microprocessor
- b. Microcontroller
- c. Both (a) and (b)
- d. None of these

Correct Answer: b. Microcontroller

Detailed Solution: WSN in agriculture uses Microcontroller for processing.

See lecture 16 (Sensor Networks-III) @ 17:07



QUESTION 6:

Which of the following is/are options for communication among nanodevices?

- a. Electromagnetic
- b. Molecular
- c. Both (a) and (b)
- d. None of these

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

Detailed Solution: Electromagnetic and molecular are options for communication among nanodevices

See lecture 16 (Sensor Networks-III) @ 25:11

QUESTION 7:

State whether the following statement is true or false.

Statement: Voluntary Sensing allows distributed sensing carried by humans and the goal is not just to collect data but to allow the common people to assess and share the knowledge.

- a. False
- b. True

Correct Answer: a. False

Detailed Solution: Participatory sensing allows distributed sensing carried by humans and the goal is not just to collect data but to allow the common people to assess and share the knowledge.

See lecture 18 (Sensor Networks-V) @ 13:01



QUESTION 8:

State whether the following statement is true or false.

Statement: UAV networks use a ring topology.

- a. True
- b. False

Correct Answer: b. False

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

- a. Mesh or star networks
- b. Multi-tasking
- c. Large coverage area

See lecture 19 (UAV Networks) @ 02:43

QUESTION 9:

In multi-UAV networks, the scalability is _____.

- a. Low
- b. Very Low
- c. Poor
- d. None of these

Correct Answer: d. None of these

Detailed Solution: In multi-UAV networks, the scalability is high.

See lecture 19 (UAV Networks) @ 08:00

QUESTION 10:

Single UAV system uses _____ antenna.

- a. Uni-directional
- b. Omni-directional
- c. Both (a) and (b)
- d. None of these

Correct Answer: b. Omni-directional

Detailed Solution: A Single UAV system uses omnidirectional antenna.

See lecture 19 (UAV Networks) @ 08:00



QUESTION 11:

Which of the following is/are constraint/constraints of UAV network?

- a. Infrequent link breakages
- b. Malfunction
- c. Both (a) and (b)
- d. None of these

Correct Answer: b. Malfunction

Detailed Solution: Frequent link breakages and malfunction are constraints of UAV network.

See lecture 19 (UAV Networks) @ 10:33

QUESTION 12:

Low-end sensor nodes are -

- a. Whose deployment has high density in order to increase network lifetime and survivability.
- b. Who perform basic functions such as data aggregation, auto configuration, and power saving.
- c. Both (a) and (b)
- d. None of these

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

Detailed Solution: Low-end sensor nodes are -

- a. Whose deployment has high density in order to increase network lifetime and survivability.
- b. Who perform basic functions such as data aggregation, auto configuration, and power saving.

See lecture 20 (Machine to Machine Communication) @ 10:46



QUESTION 13:

State whether the following statement is true or false.

Statement: FANETs are flying ad hoc networks.

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: FANETs are flying ad hoc networks.

See lecture 19 (UAV Networks) @ 14:11

QUESTION 14:

State whether the following statement is true or false

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

- a. True
- b. False

Correct Answer: a. 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) @ 04:28

QUESTION 15:

State whether the following statement is true or false

Statement: Low-end sensor nodes are static, energy-hungry, and complex.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Low-end sensor nodes are static, energy-efficient and simple.

See lecture 20 (Machine to Machine Communication) @ 10:57

*****END*****



**Introduction to
Internet of Things
Assignment-Week 5**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

QUESTION 1:

Why interoperability in IoT is an issue?

- a. IoT nodes are heterogeneous hence they communicate in different protocols
- b. IoT nodes are homogeneous and communicate with the same protocol
- c. IoT nodes do not communicate.
- d. IoT nodes are small.

Correct Answer: a. IoT nodes are heterogeneous hence they communicate in different protocols

Detailed Solution: Refer Lecture 21 @8:30.

QUESTION 2:

UNSPSC provides a solution for which of the following?

- a. Manufacturing
- b. Supply Chain
- c. Classification
- d. Communication



Correct Answer: c. Classification

Detailed Solution: Refer Lecture 21 @ 16:40.

QUESTION 3:

Arduino development boards are equipped with micro-controller processors which are _____ with respect to their hardware configurations.

- a. closed source
- b. open source
- c. forward source
- d. up sourced

Correct Answer: b. open source

Detailed Solution: Refer Lecture 22 @ 5:48.

QUESTION 4:

Translation of inter-device communication forms an important part in solving device interoperability.

- a. True
- b. False



Correct Answer: a. True

Detailed Solution: Refer Lecture 21 @23:43.

QUESTION 5:

With respect to the different wireless communication protocols such as Zigbee, Bluetooth, GPRS, 6LoWPAN and WiFi, which of the following terms can be associated with?

- a. Homogeneity
- b. Heterogeneity
- c. Self Service
- d. All of the given

Correct Answer: b. Heterogeneity

Detailed Solution: Refer Lecture 21 @9:46.

QUESTION 6:

Which among the following are valid Arduino datatypes?

- a. byte
- b. char
- c. Boolean
- d. All of the given

Correct Answer: d. All of the given

Detailed Solution: Refer Lecture 22 @18:28.



QUESTION 7:

What is the purpose of the delay() function in Arduino programming?

- a. To speed up the execution
- b. To terminate the program
- c. To reset all parameters
- d. To make the program go to sleep for a certain duration.

Correct Answer: d. To make the program go to sleep for a certain duration.

Detailed Solution: Refer Lecture 22@21:19.

QUESTION 8:

Consider the following Arduino code snippet

```
String str = "HelloWorld";
```

```
String ptr = str.ToUpperCase();
```

What will be the value of String ptr?

- a. HelloWorld
- b. helloworld
- c. HELLOWORLD
- d. WORLDHELLO

Correct Answer: c. HELLOWORLD

Detailed Solution: Refer Lecture 23@8:10.



QUESTION 9:

What does the following code snippet do in interfacing a servo motor with the Arduino MEGA board?

```
int servoPin = 12;
```

- a. Declares pin for connecting servo motor
- b. Declares pin for providing power to MEGA board
- c. Declares pin for Ground supply for servo motor
- d. None of these

Correct Answer: a. Declares pin for connecting servo motor

Detailed Solution: `int servoPin = 12;` Declares pin for connecting servo motor. Refer Lecture 25@07:54.

QUESTION 10:

State True or False.

Statement: “The “Verify” option in the Arduino IDE checks the code for compilation errors.”

- a. True



b. False

Correct Answer: a. True

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

QUESTION 11:

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 12:

In general, with respect to any sensor that can be connected to an Arduino board, which of the following is correct?

- a. The sensor has infinite number of connecting pins
- b. The sensor will have at least 3 pins (1 +Vcc, 1 GND and 1 Data pin)
- c. The sensor need not connect to the Arduino board.
- d. The sensor will always have exactly 5 pins.

Correct Answer: b. The sensor will have at least 3 pins (1 Vcc, 1 GND and 1 Data pin)

Detailed Answer: This follows from general sensor design principles. Refer Lecture 24@6:15.



QUESTION 13:

You connect the +Vcc PIN of a sensor with which of the corresponding PIN of Arduino board.

- a. 3V
- b. GND
- c. PIN A5
- d. PIN CTX

Correct Answer: a. 3V

Detailed Solution: As per standard Arduino interfacing. Refer Lecture 24.

.



QUESTION 14:

Servo is a type of _____.

- a. Sensor
- b. Actuator
- c. Modifier
- d. Pacifier

Correct Answer: b. Actuator

Detailed Solution: Refer Lecture 25.

QUESTION 15:

While uploading a sketch to an Arduino board, which of the following should be checked?

- a. Board
- b. Serial Port
- c. Both Board and Serial Port
- d. Neither Board nor Serial Port.

Correct Answer: c. Both Board and Serial Port

Detailed Solution: Refer Lecture 24 and 25, specifically on the part of uploading sketches to the Arduino board.



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Introduction to Internet
of Things Assignment-
Week 6

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1 = 15

QUESTION 1:

Python programming language can be easily interfaced with different IoT hardware?

- a. True
- b. False

Correct Answer: a. True

Detailed Solution: Refer Lecture 26@4:47.

QUESTION 2:

Consider the following Python instruction

aa, bb, cc = 34, [12,23,34], 56.89

Is the above a valid Python instruction?

- a. Yes
- b. No

Correct Answer: a. Yes

Detailed Solution: Refer Lecture 26@9:10.



QUESTION 3:

Which of the following is a valid conditional construct instruction in Python?

- a. else-if
- b. elif
- c. ellif
- d. ele

Correct Answer: b. elif

Detailed Solution: Refer Lecture 26@16:10.



QUESTION 4:

Consider the following Python code snippet. Assume Python v3.

with open("hello.txt", "w+") as f:

f.write("I am learning Python programming")

f.seek(0)

lines = f.readline()

result = lines[2]

print(result)

- a. 'I am'
- b. 'I'
- c. 'a'
- d. 'am'

Correct Answer: c. 'a'

Detailed Solution: As per Python programming constructs. Refer Lecture 27 on Python file handling.



QUESTION 5:

Which of the following is a mode to open a file in Python?

- a. Read mode
- b. Write mode
- c. Append mode
- d. All of these

Correct Answer: d. All 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

Refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @ 03:00.

QUESTION 6:

What does the following line of code do?

`GPIO.output(11,True)`

- a. Sets GPIO 11 as output pin
- b. Turns on GPIO pin 11
- c. Neither (a) nor (b)
- d. Both (a) and (b)

Correct Answer: b. Turns on GPIO pin 11



Detailed Solution: Turns on GPIO pin 11

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

QUESTION 7:

What is the utility of the ‘pip’ instruction with respect to Python programming?

- a. To act as a package installer
- b. To delete the Python version
- c. To change from Python v2 to v3
- d. None of the given

Correct Answer: a. To act as a package installer

Detailed Solution: Refer Lecture 27@17:14.

QUESTION 8:

Suppose you have used the `sock.bind(server_address)` while writing programs with sockets in Python.

With respect to this, which among the following is a valid initialization of the `server_address` object?

- a. (1223,1223)
- b. ('10.12.56.34',1223)
- c. ('12.56.78.221', '10.12.34.56')
- d. (1223, '67.34.56.7789')

Correct Answer: b. ('10.12.56.34',1223)



Detailed Solution: Server address tuple always contains the server IP address and port number in order. Refer to Python socket programming in Lecture 27.

QUESTION 9:

Where do you store the image file of the Raspberry Pi OS before using it to execute the OS on the Pi?

- a. Over the cloud
- b. Directly on the Pi motherboard
- c. Inside a memory card attached to the Pi
- d. OS is installed through wireless means

Correct Answer: c. Inside a memory card attached to the Pi

Detailed Solution: Refer Lecture 28@15:14



QUESTION 10:

With which of the following remote access mechanism can you access a Raspberry Pi from your laptop computer?

- a. ssp
- b. ssh
- c. ssj
- d. ssd

Correct Answer: b. ssh

Detailed Solution: Refer Lecture 28@18:00 onwards.

QUESTION 11:

Fill in the blanks. Raspberry Pi 3 Model B has a GPU support of _____

- a. 400 MHz video core IV
- b. 250 MHz video core IV
- c. Quad cortex A53@1.2GHz
- d. ARM 11 @ 1 GHz

Correct Answer: a. 400 MHz video core IV

Detailed Solution: Raspberry Pi 3 Model B has a GPU support of 400 MHz video core IV.

(Please refer to lecture INTRODUCTION TO RASPBERRY PI-I @ 6:00)



QUESTION 12:

What is the data type of the variable `ls` in the following piece of Python code?

```
ls= {1:2, 3:4, 5:6, 7:8}
```

- a. dictionary
- b. list
- c. tuple
- d. All of these

Correct Answer: a. dictionary

Detailed Solution: As per the basics of Python programming (Please refer to lecture

INTRODUCTION TO PYTHON PROGRAMMING- I @ 15:07).

QUESTION 13:

Consider the image as given below.



Which among the following component is highlighted within the red box in the image?

- a. Raspberri Pi
- b. Raspbian
- c. Raspberry Pi Camera
- d. GPIO pins

Correct Answer: c. a. Raspberry Pi Camera

Detailed Solution: The highlighted portion shows a standard Raspberry Pi camera module. Refer Lecture 29@17:43.



QUESTION 14:

Relay is a type of actuator which can be used with Arduino but not with Raspberry Pi.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Relays can be used with both Arduino as well as Raspberry Pi. They are basic IoT based actuators. Refer Lecture 30.

QUESTION 15:

State whether the following statement is true or false.

Statement: Python allows us to only read files. Writing to files is not possible.

- a. True
- b. False

Correct Answer: b. False

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

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



Introduction to
Internet of Things
Assignment-Week 7

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1 = 15

QUESTION 1:

A Raspberry Pi can read data from a sensor but cannot send it over to a remote server for further processing.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Refer Lecture 31 @ 2:49

QUESTION 2:

In Python socket programming, with respect to the `sock.bind(server_address)` function, which among the following does the variable `server_address` contain?

- a. IP address of destination
- b. Port number of destination server
- c. Neither IP address nor port number of destination server
- d. Both IP address and port number of destination server



Correct Answer: d. Both IP address and port number of destination server

Detailed Solution: Refer Lecture 31@14:00.

QUESTION 3:

In Python matplotlib, in order to display the graphical plot on a terminal, the command *plt.plot()* is used in conjunction with which of the following?

- a. `plt.plt()`
- b. `plt.show()`
- c. `plt.xticks()`
- d. `plt.axes()`

Correct Answer: b. `plt.show()`

Detailed Solution Refer Matplotlib tutorials as per Lecture 32.



QUESTION 4:

The following Python code displays a parabolic plot using matplotlib.

```
import numpy as np

import matplotlib.pyplot as plt

x = np.linspace(-10, 10, 400)

y = x**2

plt.figure(figsize=(8, 6))

plt.xlabel("x", fontname="Times New Roman", fontsize=12)

plt.ylabel("y", fontname="Times New Roman", fontsize=12)

plt.title("Plot of a Parabola:  $y = x^2$ ", fontname="Times New Roman", fontsize=14)

plt.grid(True)

plt.legend(loc="upper left")

plt.axhline(0, color='black', linewidth=0.5) # x-axis

plt.axvline(0, color='black', linewidth=0.5) # y-axis

plt.show()
```

Observe the code very carefully. Will the code plot the desired parabola?

- a. Yes



b. No

Correct Answer: b. No

Detailed Solution: plt.plot() is not included which is the principal method to plot any graph.

QUESTION 5:

With respect to the above Question (Question 4), which the must be added to make the code display the parabola?

- a. Nothing, the code works fine
- b. plt.xticks() method
- c. plt.plot() method
- d. plt.setfigure() method

Correct Answer: c. plt.plot() method.

Detailed Solution: plt.plot() is not included which is the principal method to plot any graph.

QUESTION 6:

In Python, suppose that that string text = 'It^is my#birthday!I am*Happy'.

What will the output of the following instruction

```
data = text.split(' ')
print(data[1])
```

- a. It^is my#birthday!I am*Happy
- b. my#birthday!I
- c. am*Happy



d. It^is

Correct Answer: b. my#birthday!I

Detailed Solution: As per Python guidelines.

QUESTION 7:

Consider the same text again

```
text = 'It^is my#birthday!I am*Happy'
```

Now consider the following instructions. What will be the output?

```
data = text.split('r')  
print(data[1].split('bi'))
```

- a. my#birth
- b. *Happy
- c. thday!I am*Happy
- d. It^is

Correct Answer: c. thday!I am*Happy

Detailed Solution: As per Python guidelines.

QUESTION 8:

With respect to SDN for IoT what does ‘end-devices’ in the phrase ‘control for end-devices’



mean?

- a. SDN Controllers
- b. SDN Switches
- c. Sensors and Actuators
- d. Database

Correct Answer: c. Sensors and Actuators

Detailed Solution: Refer Lecture 35@6:22.

QUESTION 9:

A Network Operating System (NOS) resides in which of the following logical plane?

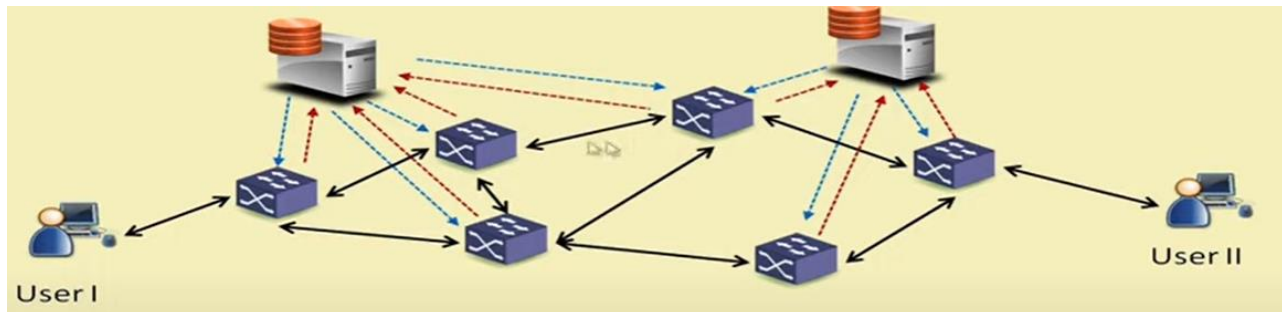
- a. Application Plane
- b. Control Plane
- c. Data Plane
- d. Both Data Plane as well as Application Plane

Correct Answer: b. Control Plane

Detailed Solution: Refer Lecture 33@13:19.

QUESTION 10:

Consider the figure of the network as given below.



Which of the following network topologies does this figure relate to?

- a. Ring topology
- b. Bus topology
- c. Mesh topology
- d. Tree topology

Correct Answer: c. Mesh topology

Detailed Solution: Refer Lecture 34@7:27.

QUESTION 11:

With respect to the same figure (given below), what does the blue directional dotted arrows from the controller to the switches represent?

- a. Northbound API
- b. Southbound API
- c. Eastbound API
- d. Westbound API

Correct Answer: b. Southbound API.



Detailed Solution: the APIs connecting the controller with the data plane switches are known as Southbound APIs.

QUESTION 12:

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

Match SDN Applications First and Use Normal For Unmatched Packets (Hybrid Default Forwarding)										
Priority	Ingress Port	MAC Source Address	MAC Destination	Protocol	Vlan ID	IP Source Address	IP Destination	Source Port	Destination Port	Instructions
10000	*	*	*	TCP	*	*	10.1.1.20/32	*	80	Forward to Port 1
5000	*	*	*	*	*	*	10.1.1.0/24	*	*	Forward to Port 2
500	*	*	*	*	2600	*	*	*	*	Send to Controller
0	*	*	*	*	*	*	*	*	*	OF Normal

- a. Controller placement issue
- b. Flow Rule placement issue
- c. Hardware placement issue
- d. Analysis placement issue

Correct Answer: b. Flow Rule placement issue

Detailed Solution: The given figures shows the tabular structure of how flow rules are installed within SDN switches, so it pertains to flow rule placement issues. Refer Lecture 33@18:54, Rule Placement.

QUESTION 13:

Which among the following is the most suitable utility of Mininet?

- a. To act as a virtual sensor



- b. To provide a simulation environment for SDN with OpenFlow
- c. To act as a generic antenna simulator
- d. To perform load testing and analysis.

Correct Answer: b. To provide a simulation environment for SDN with OpenFlow

Detailed Solution: Refer Lecture 34@12:23.

QUESTION 14:

Control of end devices such as sensors and actuators do not form a use-case for Software Defined IoT.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Refer Lecture 35@6:06.

QUESTION 15:

With respect to packet delivery ratio, which of the following is true?

- a. WSN outperforms Soft-WSN
- b. Soft-WSN outperforms WSN
- c. Neither of Soft-WSN and WSN outperform each other
- d. No relation between Soft-WSN and WSN

Correct Answer: b. Soft-WSN outperforms WSN



Detailed Solution: Refer Lecture 35@11:37.

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



Introduction to Internet
of Things Assignment-
Week 8

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1 = 15

QUESTION 1:

Which of the following is true with respect to Network Virtualization?

- a. It abstracts the virtual network on a physical network
- b. It abstracts the physical network on a virtual network
- c. It is essentially a collection of physical SDN routers
- d. Network virtualization is a non-existent concept.

Correct Answer: b. It abstracts the physical network on a virtual network.

Detailed Solution: Refer Lecture 36@3:57.

QUESTION 2:

For rule placement at the edge with respect to Software Defined IoT, which of the following is a critical issue that is required to be addressed?

- a. Existence of IoT nodes
- b. Data through routers
- c. Mobility of end users and nodes
- d. None of the given.



Correct Answer: c. Mobility of end users and nodes.

Detailed Solution: Refer Lecture 36@9:03.

QUESTION 3:

Which cloud service model allows users to deploy and control their own software, including operating systems, while the provider manages the infrastructure?

- A) SaaS
- B) PaaS
- C) IaaS
- D) DBaaS

Correct Answer: c. IaaS

Detailed Solution: Refer Lecture 38, Slide 4, concepts on IaaS.

QUESTION 4:

Which of the following is NOT a characteristic of Platform-as-a-Service (PaaS)?

- A) Provides tools for application deployment
- B) Requires users to manage the virtual machines
- C) Offers elastic scaling of applications
- D) Simplifies development by abstracting the infrastructure

Correct Answer: b. Requires users to manage the virtual machines

Detailed Solution: Refer Lecture 38, Slide 15, concepts on PaaS



QUESTION 5:

Which essential characteristic of cloud computing refers to the ability of resources to be scaled up or down automatically?

- a. Resource pooling
- b. Broad network access
- c. Elasticity
- d. None of the given

Correct Answer: c. Elasticity

Detailed Answer: Refer Lecture 37, Slide 9.

QUESTION 6:

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

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

Correct Answer: c. Hybrid Cloud

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



QUESTION 7:

A Private Cloud deployment model cannot provide IaaS but can provide PaaS.

- a. False
- b. True

Correct Answer: a. False

Detailed Solution: All types of cloud deployment models can provide all types of service models.

QUESTION 8:

What is the primary function of a Light Virtual Access Point (LVAP) in the ODIN architecture for SDN-based IoT?

- a) Acts as a firewall between user devices and access points
- b) Enables virtualization of Wi-Fi APs for per-client network control
- c) Encrypts user traffic before forwarding to the cloud
- d) Controls routing at the backbone of the network

Correct Answer: b. Enables virtualization of Wi-Fi APs for per-client network control

Detailed Answer: Refer Lecture 36, Slide 12.



QUESTION 9:

With respect to Virtualization, if one VM runs on a hypervisor, another VM is unable to use the hypervisor.?

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Refer Lecture 38@5:16.

QUESTION 10:

Through which of the following cloud service model, do you use an image editing application without explicitly installing the said application on your local system?

- a. SaaS
- b. PaaS
- c. IaaS
- d. DaaS

Correct Answer: a. SaaS

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



QUESTION 11:

Which of the following best defines 'measured service' in cloud computing?

- a. Cloud resources are billed only annually
- b. Users must request reports manually for resource usage
- c. Cloud systems automatically control and optimize resources based on metering
- d. None of the given

Correct Answer: c. Cloud systems automatically control and optimize resources based on metering

Detailed Solution: Refer Lecture 37, Slide No 10

QUESTION 12:

With respect to Cloud security, which of the following is expected to have a higher level of security than the other in a very generic sense, on the assumption that on-premise data storage generally is more secure than off-premise data storage.

- a. Public Cloud
- b. Private Cloud

Correct Answer: b. Private Cloud

Detailed Solution: Private cloud stores data on-premise, so on this assumption, it is more secure than public cloud. Refer Lecture 39 on Cloud Security.



QUESTION 13:

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

- a. SaaS
- b. SaaS and PaaS
- c. IaaS
- d. All of them

Correct Answer: d. All of them

Detailed Solution: Security is a pertinent issue in all of the cloud service models, which includes SaaS,

PaaS and IaaS. Refer to any standard discussion on challenges and issues on cloud computing and Lecture

39.

QUESTION 14:

In cloud computing, the users have specific knowledge about the exact physical location of the computing hardware with respect to the cloud services.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: In cloud computing, the users have no knowledge about the backend physical hardware orchestration and management. Refer Lecture 37.



QUESTION 15:

GreenCloud implementation focuses most on which of the following aspects?

- a) Scalability
- b) Energy
- c) Reversibility
- d) Computation

Correct Answer: b. Energy

Detailed Solution: Refer Lecture 40@14:48.

*****END*****



**Introduction to
Internet of Things
Assignment-Week 9**

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15

QUESTION 1:

Fog is the layer between which two layers?

- a. Application and Presentation
- b. Network and Transport
- c. Cloud and IoT
- d. Transport and Session

Correct Answer: c. Cloud and IoT

Detailed Solution: Fog is the layer between Cloud and IoT.

See Lecture 45 @ 07:04

QUESTION 2:

Which of the following is/are the actors in sensor-cloud?

- a. Users
- b. Sensor-owner
- c. SCSP
- d. All of the above

Correct Answer: d. All of the above



Detailed Solution: The actors in sensor-cloud include end users, sensor-owner and SCSP .
(Please refer Lecture 42@14:24)

QUESTION 3:

Which of the following are considered key limitations of Wireless Sensor Networks (WSNs)?

- a. Cost of sensor nodes
- b. Physical deployment of sensors
- c. Both a and b
- d. Neither a nor b

Correct Answer: c. Both a and b

Detailed Solution: WSNs face several limitations beyond just hardware cost, including the complexity of procurement, difficulty in physical deployment, and ongoing maintenance issues.
(Please refer : Lecture 42 @ 10:52)

QUESTION 4:

Which of the following takes the decision whether the data should be provided directly to the end user or is it required to re-cache the data from external cache?

- a. User cache
- b. Sensor cache
- c. External cache



d. Internal Cache

Correct Answer: d. Internal Cache

Detailed Solution: Internal Cache takes the decision whether the data should be provided directly to the end user or is it required to re-cache the data from external cache. (Please refer Lecture 43@22:13)

QUESTION 5:

Fill in the blanks

The _____ extends the cloud nearer the IoT devices.

- a. Sensors
- b. Fogging
- c. Neither a nor b
- d. Both a and b

Correct Answer: b. Fogging

Detailed Solution: Fogging or fog computing extends the cloud nearer the IoT devices . (Please refer Lecture 44@6:33)

QUESTION 6:

Which of the following is/are the types of data with respect to sensitivity.

- a. Time-sensitive
- b. Less time-sensitive
- c. Not time-sensitive



d. All of these

Correct Answer: d. All of these

Detailed Solution: Time-sensitive, less time-sensitive and not time-sensitive are the types of data with respect to sensitivity. (Please refer Lecture 44@20:05)

QUESTION 7:

Who coined the term Fog computing?

- a. IBM
- b. CISCO
- c. Both a and b
- d. Neither a nor b

Correct Answer: b. CISCO

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

QUESTION 8:

What of the following is an advantage of fog computing ?

- a. Anywhere deployability
- b. Mobility
- c. Both a and b



d. Neither a nor b

Correct Answer: c. Both a and b

Detailed Solution: Fog computing supports anywhere deployability and mobility. (Please refer Lecture 45@21:21)

QUESTION 9:

State True or False

Openstack is an open-source software.

a. True

b. False

Correct Answer: a. True

Detailed Solution: Openstack is an open-source software. (Please refer Lecture 41@2:14)

QUESTION 10:

To what are the fog nodes connected to?

- a. IoT devices
- b. Cloud
- c. Neither a nor b
- d. Both a and b

Correct Answer: d. Both a and b

Detailed Solution: The fog nodes are connected to the IoT devices and Cloud. (Please refer Lecture 45@11:05)

QUESTION 11:



Which of the following reduces danger and increases output?

- a. Static analysis
- b. Static decision making
- c. Both a and b
- d. Neither a nor b

Correct Answer: d. Neither a nor b

Detailed Solution: Dynamic analysis and decision making reduces danger and increases output. (Please refer Lecture 45@25:00)

QUESTION 12:

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

- a. Dew and devices
- b. Cloud and devices
- c. Cloud and server
- d. None of these

Correct Answer: b. Cloud and devices

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

QUESTION 13:

Unnecessary sensing causes energy consumption.

- a. True



b. False

Correct Answer: a. True

Detailed Solution: Unnecessary sensing causes energy consumption. (Please refer Lecture 43@20:54)

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

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



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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.)

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



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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:

DLNA (used in HAN standards) expands to:

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

Correct Answer: b

Detailed Solution: DLNA = Digital Living Network Alliance. (Lecture 48 @ 13:49)

QUESTION 2:

Which property best characterizes V2X?

- a) Restricted to a single source
- b) Distributed architecture
- c) Both a and b
- d) Neither a nor b

Correct Answer: b

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



QUESTION 3:

Which set correctly captures smart-home functionality?

- a) Health monitoring only
- b) Security only
- c) Both health monitoring and security
- d) Neither

Correct Answer: c

Detailed Solution: Smart homes include both health monitoring and security. (Lecture 46 @ 23:52)

QUESTION 4:

Which are valid types of sensing?

- a) Stationary
- b) Mobile
- c) Both a and b
- d) None of these

Correct Answer: c

Detailed Solution: Sensing can be stationary or mobile. (Lecture 47 @ 19:36)



QUESTION 5:

Which layers are part of the Zigbee stack?

- a) Physical and transport
- b) MAC and transport
- c) Network and MAC
- d) Transport and MAC

Correct Answer: c

Detailed Solution: Zigbee includes Physical, MAC, and Network layers. (Lecture 48 @ 16:23)

QUESTION 6:

Smart parking primarily reduces traffic _____.

- a) mobility
- b) area
- c) analysis
- d) congestion

Correct Answer: d

Detailed Solution: Smart parking reduces traffic congestion. (Lecture 47 @ 16:58)



QUESTION 7:

About Home Area Network (HAN), consider: I) Multi-protocol gateway bridges non-IP to IP. II) Wired HAN is low cost. III) Wireless HAN makes implementation easy. *Which of these is correct?*

- a) Only I
- b) I and II only
- c) I and III only
- d) I, II, and III

Correct Answer: d

Detailed Solution: All three are correct per lecture context. (Lecture 48 @ 11:24)

QUESTION 8:

Which statements about smart health are true? I) Low-cost and portable II) Allows remote check-ups and diagnosis III) Effortless health monitoring

- a) I only
- b) II only
- c) I, II, and III
- d) None of these

Correct Answer: c

Detailed Solution: All listed properties were highlighted in lecture. (Lecture 46 @ 26:12)____



QUESTION 9:

Phases of Intelligent Connected Vehicle (ICV) development include:

- a) Based on 2G
- b) Based on 4G LTE
- c) Both a and b
- d) None of these

Correct Answer: c. Both a and b

Detailed Solution: Three phases as listed. (Lecture 50 @ 12:28)

QUESTION 10:

In the Ad-hoc domain of VANET, vehicles are:

- a) Stationary
- b) Mobile
- c) Fixed to RSUs only
- d) None of these

Correct Answer: b

Detailed Solution: Vehicles are mobile in the ad-hoc domain. (Lecture 50 @ 16:59)



QUESTION 11:

Domains of VANET include:

- a) In-vehicle and ad-hoc
- b) Ad-hoc and data center
- c) Data center
- d) None of these

Correct Answer: a

Detailed Solution: In-vehicle and Ad-hoc are VANET domains (per the lecture scope). (Lecture 50 @ 14:36)

QUESTION 12:

At which data fusion stage are multiple classifier outputs combined?

- a) Pixel level
- b) Feature level
- c) Signal level
- d) Decision level

Correct Answer: d

Detailed Solution: Ensemble of decisions happens at the decision level. (Lecture 47 @ 11:23)



QUESTION 13:

The Body & Brain Architecture consists of how many layers?

- a) 1
- b) 2
- c) 3
- d) 4

Correct Answer: c

Detailed Solution: It consists of three layers. (Lecture 49 @ 23:09)

QUESTION 14:

Which statement about smart home infrastructure is correct?

- a) It cannot include wireless devices.
- b) It may include wired and/or wireless devices.
- c) It must be wireless-only.
- d) None of these

Correct Answer: b

Detailed Solution: Smart homes can use wired and/or wireless devices. (Lecture 48 @ 6:17)



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QUESTION 15:

Intelligent Connected Vehicles (ICV) communication 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

Detailed Solution: ICV is based on DSRC. (Lecture 50 @ 7:22)

*****END*****



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Introduction to Internet of
Things Assignment-Week

11

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1 = 15

QUESTION 1:

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

- a. Energy internet
- b. Electricity with a hand
- c. Electrolyte
- d. All of these

Correct Answer: a. Energy internet

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

QUESTION 2:

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 centralised power plants. (Please refer Lecture 51 @ 5:45)



QUESTION 3:

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

- a. Reduced transmission of electricity
- b. Higher electricity rates
- c. Less security
- d. Different pricing options

Correct Answer: d. Different pricing options

Detailed Solution: Smart Grids provide different pricing options for customers, lower electricity rates and Improved security. (Please refer Lecture 51 @ 16:33)

QUESTION 4:

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

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 5:

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

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)

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

QUESTION 6:

Which of the following aggregate the energy consumption or energy request of a certain geographical area?

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

Correct Answer: a. DAUs

Detailed Solution: DAUs aggregate the energy consumption or energy request of a certain geographical area. (Please refer Lecture 52@15:17)



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 performed by compromising the availability of the grid component.

- a. Gateway
- b. Data injection attacks
- c. AMH
- d. Denial of service

Correct Answer: d. Denial of service

Detailed Solution: Denial of service is performed by compromising the availability of the grid component. (Please refer Lecture 52@19:52)



QUESTION 9:

Fill in the blank.

_____ is a primary challenge in IIoT.

- a. Worker health and safety
- b. Optimised operations
- c. Regulatory compliance
- d. Integrate existing infrastructure into new IIoT infrastructure

Correct Answer: d. Integrate existing infrastructure into new IIoT infrastructure

Detailed Solution: Integrate 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. _____ is based on a wrap and re-use approach.

- a. AoT
- b. PoT
- c. ToII
- d. IIoT

Correct Answer: d. IIoT

Detailed Solution: IIoT is based on the wrap and re-use approach. (Please refer Lecture 53@9:51)



QUESTION 11:

Mechanized production is a part of the 4th Industrial Revolution.

- a. True
- b. False

Correct Answer: b. False

Detailed Solution: Mechanized production is a part of the 1st Industrial Revolution.
(Please refer Lecture 53@10:41)

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 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 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 the Flow of data?

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

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

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

*****END*****



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Introduction to

Internet of Things

Assignment-Week 12

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15

Total marks: 15 X 1= 15



QUESTION 1:

The two types of data analysis are _____.

- a. **Qualitative and Quantitative**
- b. Repetitive and Quantitative
- c. Repetitive and Qualitative
- d. All of these

Correct Answer: a. Qualitative and Quantitative

Detailed Solution: Qualitative and Quantitative are the two types of data analysis. (Please refer Lecture 56@2:33)

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 type of ANOVA.

Statement I: One way analysis

Statement II: Two way analysis

Statement III: K-way analysis

a. Statement I

b. Statement II

c. Statements I, II, and III

d. None of these

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

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

QUESTION 4:

What is the type of the data dispersion?

a. Range



- b. Average absolute deviation
- c. Variance
- d. All of these

Correct Answer: d. All of these

Detailed Solution: Range, average absolute deviation and variation are the type of data dispersions. (Please refer Lecture 56@13:43)

QUESTION 5:

The two most relevant sensors directly used in agricultures 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

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 mathematical equation that is formulated in the form of relationships between variables is known as _____.

- a. Logical model
- b. Relational model
- c. Data dispersion



d. Statistical model

Correct Answer: d. Statistical model

Detailed Solution: The mathematical equation that is formulated in the form of relationships between variables is known as Statistical model (Please refer Lecture 56@7:53)

QUESTION 7:

What are the two types of statistical models?

- a. Qualitative and quantitative
- b. Complete and incomplete
- c. Regression and dispersion
- d. None of these

Correct Answer: b. Complete and incomplete

Detailed Solution: Complete and incomplete are two types of statistical models (Please refer Lecture 56@8:11)

QUESTION 8:

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

Correct Answer: b. Sensing layer, aggregated layer, processing layer, cloud platform layer

Detailed Solution: The sensing layer senses data and transmit it o 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 9:

Wireless IoT driven solutions for remote healthcare facility provisioning brings healthcare to patients than bringing patients to healthcare.

a. True

b. False

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:

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

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 11:

Which of the following are components of IoT?

- a. Sensing layer
- b. Aggregated layer
- c. Processing layer

d. All of these

Correct Answer: d. All of these

Detailed Solution: Sensing layer, Aggregated layer, Processing layer and cloud platform are components of IoT. (Please refer Lecture 58@8:17)

QUESTION 12:

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**

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 13:

Deep learning based data analysis cannot be performed on videos



a. True

b. False

Correct Answer: b. False

Detailed Solution: Deep learning based data analysis can be done on sensor data, images and videos. (Please refer Lecture 59@19:34)

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



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- c. Vehicle detection
- d. All of these

Correct Answer: a. Fall detection

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

*****END*****