Introduction to Internet of Things

Assignment-Week 0

TYPE OF QUESTION: MCQ/MSQ

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

QUESTION 1:

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

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

Correct Answer: a. RFID

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

QUESTION 2:

How many layers does Zigbee consist of?

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

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

QUESTION 3:

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

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

Correct Answer: b. Local Servers

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

QUESTION 4:

Which of the following is a distance measuring sensor module?

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

Correct Answer: b. HC-SR04

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

QUESTION 5:

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

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

Correct Answer: d. All of these

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

QUESTION 6:

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

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

Correct Answer: d. None of these

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

See lecture 59 @ 15:41

QUESTION 7:

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

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

Correct Answer: a. International Society of Automation

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

QUESTION 8:

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

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

Correct Answer: d. Storage

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

QUESTION 9:

Smart grid is also known as the energy internet.

a. True
b. False

Correct Answer: a. True

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

QUESTION 10:

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

a. Yes

b. No

Correct Answer: a. Yes

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

See lecture 18 @ 01:10

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

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Introduction to Internet of Things

Assignment-Week 1

TYPE OF QUESTION:MCQ/MSQ

Number ofquestions:15 **Total marks: 15 X 1= 15**

QUESTION 1:

Which of the following are the enablers of IoT?

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

Correct Answer: d. All of the these

Detailed Solution: The enablers of IoT are –

a. RFID
b. Nanotechnology
c. Sensors

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

QUESTION 2:

Which of the following is/are NOT a characteristic of IoT?

a. Efficient, scalable and associated architecture.
b. Ambiguous naming and addressing.
c. Abundance of sleeping nodes, mobile and non-IP devices.
d. None of these

Correct Answer: b.Ambiguous naming and addressing.

Detailed Solution:The characteristics of IoT are –

a. Efficient, scalable and associated architecture

b. Unambiguous naming and addressing

c. Abundance of sleeping nodes, mobile and non-IP devices

See lecture 1 (Introduction to IoT – Part - I) @ 16:02

QUESTION 3:

State whether the following statement is True or False.

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

a. True
b. False

Correct Answer: a. True

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 4:

State whether the following statement is True or False.

Statement: The gateway has a unique network prefix, which can be used to identify them globally.

a. True
b. False

Correct Answer: a. True

Detailed Solution: The gateway has a unique network prefix, which can be used to identify them globally.

See lecture 2 (Introduction to IoT – Part - II) @ 6:58

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:

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 IPv6 notation uses _____ values.

a. Roman
b. Hexadecimal
c. Both (a) and (b)
d. None of these

Correct Answer: b. Hexadecimal

Detailed Solution: The IPv6 notation uses hexadecimal values.

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

QUESTION 8:

A _____ detects (senses) changes in the ambient conditions or in the state of another device or a system, and forwards or processes this information in a certain manner.

a. Sensor
b. Actuator
c. Both (a) and (b)
d. None of these

Correct Answer: a. Sensor.

Detailed Solution: A sensor detects (senses) changes in the ambient conditions or in the state of another device or a system, and forwards or processes this information in a certain manner..

See lecture3 (Sensing) @ 03:17

QUESTION 9:

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 10:

The _____ of a sensor is the smallest change it can detect in the quantity that it is measuring.

a. Resolution
b. Bias
c. Noise
d. None of these

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:

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

a. Scalar and Vector/Multimedia
b. Only scalar
c. Both (a) and (b)
d. Only vector

Correct Answer: a. 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 12:

Solenoid valve is an example of _____.

a. Sensor
b. Actuator
c. Processing unit
d. None of these

Correct Answer: b. Actuator

Detailed Solution: Solenoid valve is an example of actuator.

See lecture 4 (Actuation) @ 02:49

QUESTION 13:

An actuator requires a _____ and _____.

a. Control signal and a bias signal
b. Control signal and a source of energy
c. Noise signal and a source of energy
d. None of these

Correct Answer: b. Control signal and source of energy

Detailed Solution: An actuator requires a control signal and source of energy.

See lecture 4 (Actuation) @ 03:50

QUESTION 14:

State whether the following statement is True or False.

Statement: Pneumatic rack and pinion actuators are used for valve controls of water pipes.

a. True
b. False

Correct Answer: a. True

Detailed Solution: Pneumatic rack and pinion actuators are used for valve controls of water pipes. See lecture 4 (Actuation)@ 07:52

QUESTION 15:

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

a. Switching
b. Routing
c. Protocol conversion
d. Generating noise

Correct Answer: d. Generating noise

Detailed Solution: Switching, routing, and protocol conversion are the functions of an IoT gateway.

See lecture 5 (Basics of IoT Networking – Part - I) @ 19:27

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

Correct Answer: a. 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. Publishers
b. Message Broker
c. Subscribers
d. All of these

Correct Answer: b. 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:

Which of the following is NOT a component of MQTT?

a. Publishers
b. Users
c. Brokers
d. None of these

Correct Answer: b. Users

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:

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

a. SMQTT, three
b. BMQTT, three
c. SMQTT, four
d. None of these

Correct Answer: c. SMQTT, four

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:

Which of the following is based on Request-Response model between end-points.

a. MQTT
b. CoAP
c. Both (a) and (b)
d. Neither (a) nor (b)

Correct Answer: b. CoAP

Detailed Solution: CoAP is based on Request-Response model between end-points.

See lecture 7 (Basics of IoT Networking – Part III) @ 00:31

QUESTION 6:

The two sub-layers of CoAP are -

a. Messaging and Holding
b. Messaging and Backoff
c. Messaging and Teardown
d. Messaging and Request/response

Correct Answer: d. Messaging and Request/response

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:

Which of the following is used for real-time exchange of structured data?

a. MQTT
b. SMQTT
c. XMPP
d. CoAP

Correct Answer: c. XMPP

Detailed Solution: XMPP is used for real-time exchange of structured data.

See lecture 7 (Basics of IoT Networking – Part III) @ 11:28

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:

With respect to AMQP, which of the following message delivery guarantees allow for each message to be delivered certainly as well as to be delivered multiple times.

a. At-least-once
b. At-most-once
c. Exactly-once
d. Both (a) and (b)

Correct Answer: a. At-least-once

Detailed Solution: The message delivery guarantees of AMQP are –

- At-most-once – each message is delivered once or never.
- At-least-once – each message is certain to be delivered, but may do so multiple times.
- Exactly-once – message will always certainly arrive and do so only once.

See lecture 8 (Basics of IoT Networking – Part IV) @ 05:35

QUESTION 10:

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

a. Open
b. Close
c. End
d. None of these

Correct Answer: d. None of these

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:

Which of the following is/are NOT the function/functions of the Bindings component of the AMQP protocol?

a. Receives messages and routes them to queues
b. Separate queues for separate business process
c. Consumer receive messages from queues
d. All of these

Correct Answer: d. All of these

Detailed Solution: The Bindings component of the AMQP protocol manages the rules for distributing messages (who can access what messages, destination of the message)

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

QUESTION 12:

Which of the following is/are NOT exchange types in AMQP?

a. Direct
b. Indirect
c. Fan-out
d. Topic

Correct Answer: b. Indirect

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 is a well-known standard for low data-rate Wireless Personal Area Network (WPAN).

a. True
b. False

Correct Answer: a. True

Detailed Solution: The IEEE 802.15.4 is a well-known standard for low data-rate Wireless Personal Area Network (WPAN).

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: Periodic transmission of beacon messages does not occur in beacon enabled networks (IEEE 802.15.4).

a. False
b. True

Correct Answer: a. False

Detailed Solution: Periodic transmission of beacon messages occur in beacon enabled networks (IEEE 802.15.4).

See lecture 9 (Connectivity Technologies – Part-I) @ 13:21

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

Introduction to Internet of Things

Assignment-Week 3

TYPE OF QUESTION: MCQ/MSQ

Number ofquestions:15 **Total marks: 15 X 1= 15**

QUESTION 1:

State whether the following statement is true or false.

Statement: Wired HART lacks a network layer.

a. True
b. False

Correct Answer: a. True

Detailed Solution: Wired HART lacks a network layer.

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

QUESTION 2:

The HART physical layer is derived from _____ protocol and operates only in _____ GHz ISM band.

a. IEEE 802.15.4, 2.4
b. IEEE 802.15.4, 4.8
c. IEEE 802.16.5, 4.8
d. None of these

Correct Answer: a. IEEE 802.15.4, 2.4

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: Super-frames in HART consist of grouped 20ms wide timeslots.

a. True
b. False

Correct Answer: b. False

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

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

QUESTION 4:

_____ identifies channels consistently affected by interference and removes themfrom 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:

The _____ supervises each node in the network and guides them on when and where to send packets.

a. Application manager
b. Network manager
c. Trust manager
d. None of these

Correct Answer: b. Network manager

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:

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

a. Close proximity
b. No near contact
c. Both (a) and (b)
d. None of these

Correct Answer: a. Close proximity

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

See lecture 11 (Connectivity Technologies-III) @ 17:43

QUESTION 7:

_____ contain information which is readable by other devices, however it cannot read information itself.

a. Active NFC devices
b. Dumb NFC devices
c. Passive NFC devices
d. None of these

Correct Answer: c. Passive NFC devices

Detailed Solution: Passive NFC devices contain information which is readable by other devices, however it cannot read information itself.

See lecture 11 (Connectivity Technologies-III) @ 18:33

QUESTION 8:

NFC devices work on the principle of _____?

a. Magnetic introduction
b. Magnetic induction
c. Both (a) and (b)
d. None of these

Correct Answer: b. Magnetic induction

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

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

QUESTION 9:

Which of these is NOT a mode of operation NFC?

a. Server-to-Server
b. Peer-to-Peer
c. Read/Write
d. Card emulation

Correct Answer: a. Server-to-server

Detailed Solution: There are primarily three modes of operation in NFC as –

a. Peer-to-peer
b. Read/Write
c. Card emulation

See lecture 11 (Connectivity Technologies-III) @ 23:00

QUESTION 10:

State whether the following statement is true or false

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

a. True
b. False

Correct Answer: a. True

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:

There are _____ modes of operation in Bluetooth.

a. 3
b. 4
c. 5
d. None of these

Correct Answer: b. 4

Detailed Solution: There are 4 modes of operation in Bluetooth.

See lecture 12 (Connectivity Technologies-IV) @ 06:48

QUESTION 12:

Zwave uses _____ for signaling and control?

a. Light
b. RF
c. Sound
d. None of these

Correct Answer: b. RF

Detailed Solution: Zwave uses RF for signaling and control.

See lecture 13 (Connectivity Technologies-V) @ 2:40

QUESTION 13:

Which of the following is/are not a constraint on sensor nodes?

a. Must consume high power
b. Not be adaptive to the environment
c. Both (a) and (b)
d. None of these

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

Detailed Solution: Sensor nodes -

a. Must consume extremely low power
b. Be adaptive to the environment

See lecture 14 (Sensor Networks-I) @ 14:35

QUESTION 14:

_____ are simply those that are unable to perform an operation; this could be because of power failure and environmental events.

a. Normal nodes
b. Failed nodes
c. Badly failed nodes
d. None of these

Correct Answer: b. Failed nodes

Detailed Solution: Failed nodes are simply those that are unable to perform an operation; this could be because of power failure and environmental events.

See lecture 15 (Sensor Networks-II) @ 03:52

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:

State whether the following statement is true or false.

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

a. True
b. False

Correct Answer: a. True

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

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

QUESTION 2:

If transmission range >= 2* sensing range,

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

Correct Answer: b. Coverage implies connectivity

Detailed Solution: If transmission range >= 2* sensing range, coverage implies connectivity.

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

QUESTION 3:

The two types of reporting in WSN are -

a. Event driven and machine driven
b. Event driven and weather driven

c. Event driven and on demand
d. None of these

Correct Answer: c. Event driven and on demand

Detailed Solution: The two types of reporting in WSN are Event driven and on demand

See lecture 17 (Sensor Networks-IV) @ 08:09

QUESTION 4:

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

a. minimum, minimize
b. minimum, maximize
c. maximum, minimize,
d. maximum, maximize

Correct Answer: b. minimum, maximize

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

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

QUESTION 5:

State true or false.

The disadvantages of stationary Wireless Sensor Networks are -

Statement-I: Node failure may result in partition of networks.

Statement-II: Topology cannot change automatically.

a. Statement-I True, Statement-II False
b. Both Statements are False
c. Both Statements are True
d. None of these

Correct Answer: c. Both Statements are True

Detailed Solution: The disadvantages of stationary Wireless Sensor Networks are –

a. Node failure may result in partition of networks.

b. Topology cannot change automatically.

See lecture 18 (Sensor Networks-V) @ 1:11

QUESTION 6:

A _____ in MWSN moves in order to collect data from sensor nodes and goes to the sink and delivers the collected data from different sensor nodes.

a. Drop
b. Molecule
c. Mule
d. None of these

Correct Answer: c. Mule

Detailed Solution: A mule in MWSN moves in order to collect data from sensor nodes and goes to the sink and delivers the collected data from different sensor nodes.

See lecture 18 (Sensor Networks-V) @ 07:12

QUESTION 7:

_____ 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. Voluntary sensing
b. Compressive sensing
c. Dynamic sensing
d. Participatory sensing

Correct Answer: d. Participatory sensing

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:

Which of the following is/are NOT feature/features of UAV networks?

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

d. None of these

Correct Answer: d. None of these

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:

Which of the following is NOT a UAV network constraint?

a. Frequent link breakages
b. Prone to malfunction
c. Very Complex
d. None of these

Correct Answer: d. None of these

Detailed Solution: The following are UAV network constraints -

a. Frequent link breakages
b. Prone to malfunction
c. Very Complex

See lecture 19 (UAV Networks) @ 09:32

QUESTION 10:

In _____ configuration, UAVs form multiple star topology. One node from each group connects to the ground station.

a. Multi-star
b. Ring
c. Both (a) and (b)
d. None of these

Correct Answer: a. Multi-star

Detailed Solution: In multi-star configuration, UAVs form multiple star topology. One node from each group connects to the ground station.

See lecture 19 (UAV Networks) @ 12:03

QUESTION 11:

The full form of FANET is?

a. Flying Ad Hoc Network
b. Fast Ad Hoc Network
c. Fidelity Ad Hoc Network
d. None of these

Correct Answer: a. Flying Ad Hoc Network

Detailed Solution: The full form of FANET is Flying Ad Hoc Network.

See lecture 19 (UAV Networks) @ 14:11

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:

Which of the following are the components of the M2M ecosystem?

a. Trees
b. Ocean
c. Device Providers
d. Non-service users

Correct Answer: c. Device Providers

Detailed Solution: The components of the M2M ecosystem are as follows –

a. Device Providers
b. Internet Service Providers (ISPs)
c. Platform Providers
d. Service Providers
e. Service Users

See lecture 20 (Machine to Machine Communication) @ 13:00

QUESTION 14:

State whether the following statement is true or false

Statement: The M2M Device Platform enables access to objects connected to the Internet anywhere any time.

a. True
b. False

Correct Answer: a. True

Detailed Solution: The M2M Device Platform enables access to objects connected to the Internet anywhere any time.

See lecture 20 (Machine to Machine Communication) @ 16:47

QUESTION 15:

State whether the following statement is true or false

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

a. True
b. False

Correct Answer: a. True

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

See lecture 20 (Machine to Machine Communication) @ 17:53

**************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:

Company ABC manufactures a room temperature monitor which sends data via protocol X and company MNO manufactures another kind of room temperature sensor which sends data via protocol Y. With respect to this, which among the following correctly captures the said scenario?

a. Homogeneity of IoT

b. Heterogeneity of IoT

Correct Answer: b. Heterogeneity of IoT

Detailed Solution: IoT is characterized by heterogeneity where different kinds of devices, each communicating with different set of protocols are designed. Refer first part of Lecture 21.

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 sensing the same physical parameter

c. Two devices having different deployment location

d. Two devices having different processing and business logic

Correct Answer: d. 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. Semantic interoperability

d. All of these

Correct Answer: d. All of these

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

QUESTION 4:

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

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 5:

A Protocol Translation Unit (PTU) acts as a middleware between two IoT devices with different native protocols to enable them communicate with each other by translating the language of one device to the other one and vice versa.

a. True

b. False

Correct Answer: a. True

Detailed Solution: Refer Lecture 21@22:16 and onwards where PTU has been explained.

QUESTION 6:

Suppose that a smart CCTV camera has been configured using C++ language. With respect to the device's cosign identification as per the standard definition (A,B,C,D), which among the following the information "Configuration Lang:C++" will be most appropriately mapped ?

a. A

b. B

c. C

d. D

Correct Answer: d. D

Detailed Solution: For a device's cosign (A,B,C,D), 'D' refers to the definition of the object, hence is the most appropriate to which configuration language, which may be considered a definition will be mapped. Refer Lecture 21@21:16.

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:

What is the series of micro controller chips powering Arduino UNO boards?

a. ATM series

b. X86 series

c. ARM 64 series

d. ATMEGA series

Correct Answer: d. ATMEGA series

Detailed Solution: Arduino UNO micro controllers are powered by ATMEGA series. Refer to any standard documentation on Arduino UNO.

QUESTION 9:

In Arduino IDE the ‘Verify’ and ‘Upload’ buttons perform the exact same task.

a. False

b. True

Correct Answer: a. False

Detailed Solution: In Arduino IDE, ‘Verify’ compiles the sketch and checks for its correctness, while ‘Upload’ uploads the sketch to the Arduino board. Refer Lecture 22@13:22

QUESTION 10:

Suppose that an Arduino UNO board is connected to a pneumatic sensor which sends tyre pressure as floating point numbers. Which among the functions will you use to read from the sensor?

a. digitalRead()
b. analogWrite()
c. analogRead()
d. None of these

Correct Answer: c. analogRead()

Detailed Solution: As per the basics of Arduino programming. When you have real numbers in analog format, you use analogRead(). Refer Lecture 22.

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

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:

For integrating different types of sensors (such as DHT) with Arduino, you would need to install and #include the sensor specific libraries in your sketch.

a. True
b. False

Correct Answer: a. True

Detailed Solution: Each different type of sensor has its specific libraries and functions which must be included with the Arduino sketch. Refer Lecture 24.

QUESTION 13:

Which of the following best describes the command given below?

```
ServoDemo.write(180);
```

a. Creates an instance of the servo
b. Pin writes 180 to the servo
c. Servo moves 180 degrees
d. All of these

Correct Answer: c. Servo moves 180 degrees

Detailed Solution: As per the basics of Arduino libraries. See lecture 25 @ 08:15

QUESTION 14:

In an Arduino sketch, for the default function void setup(), which of the following is true?

a. Point where the code terminates.
b. Point where the code starts.
c. It iterates over the different tasks in the program.
d. None of the above.

Correct Answer: b. Point where code starts.
Detailed Solution: As per the basics of Arduino programming.See lecture 22@13:52

QUESTION 15:

Which among the following can also be described as a relay, which is an actuator?

a. Pneumatic actuator
b. Motor type actuator
c. Electro-mechanical switch
d. Thermal switch

Correct Answer: c. Electro-mechanical switch

Detailed Solution: Relay is a type of electro-mechanical switch and is also an actuator. Refer Lecture 25@3:57

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

Introduction to Internet of Things

Assignment-Week 6

TYPE OF QUESTION:MCQ/MSQ

Number ofquestions:15 **Total marks: 15 X 1= 15**

QUESTION 1:

Python doesn't support strict rules for syntax and static variable declaration like C

a. True
b. False

Correct Answer: a. True
Detailed Solution: As per Python program. (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 4:23)

QUESTION 2:

Fill in the blanks. _____ is a data-type in Python.

a. List
b. Tuple
c. Dictionary
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 @ 15:18)

QUESTION 3:

Fill in the blanks. _____are the variables declared inside a function.

a. Immediate variables

b. Global variables

c. Local variables

d. None of these

Correct Answer: c. Local variables

Detailed Solution: As per Python program (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- I @ 25:41).

QUESTION 4:

What does the open() function return for file operations?

a. File mode
b. File object
c. File name
d. None of these

Correct Answer: b. File object

Detailed Solution: As per the basics of Python programming. (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @ 3:00)

QUESTION 5:

Python does not follow rigid 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 @ 8:18)

QUESTION 6:

Which of the following is used to display an image in Python?

a. image.show()
b. image.open()
c. image.name()
d. image.mode()

Correct Answer: a. image.show()

Detailed Solution: As per the basics of Python programming. (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @ 18.26)

QUESTION 7:

Which of the following models does python follow for networking.

a. Client-server
b. P2P
c. All of these
d. None of these

Correct Answer: a. Client-server

Detailed Solution: In python programming, python provides network services for client-server models. (Please refer to lecture INTRODUCTION TO PYTHON PROGRAMMING- II @ 23:29)

QUESTION 8:

In python, ”with” ensures the file is closed after the operation is completed, but not when an exception occurs.

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 @4:58).

QUESTION 9:

In Raspberry Pi, GPIO acts only as a digital output.

a. True
b. False

Correct Answer: b. False
Detailed Solution: Raspberry Pi GPIO acts as both digital output and digital input. (Please refer to lecture 28@10:14).

QUESTION 10:

Which of the following exits the nano editor in the terminal?

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

Correct Answer: b. Ctrl+X

Detailed Solution: Ctrl+X exists the editor.
See lecture 29 @ 10:25

QUESTION 11:

Does Raspberry Pi provide configuration options for cameras ?

a. Yes
b. No

Correct Answer: a. Yes

Detailed Solution: Raspberry Camera can be configured using raspi-config. See lecture 29 @ 19:04

QUESTION 12:

Does python provide a module for pi-camera ?

a. Yes
b. No

Correct Answer: a. Yes

Detailed Solution: Raspberry Camera can be configured using the Python camera module python-picamera. See lecture 29 @ 19:59.

QUESTION 13:

Which of the following converts energy to motion?

a. Actuator
b. Raspberry Pi
c. All of these
d. None of these

Correct Answer: a. Actuator

Detailed Solution: Actuator converts energy to motion.
See lecture 30 @ 03:37

QUESTION 14:

Which of the following is a property of a Relay.

a. Mechanical switch
b. Electrochemical switch
c. None of these
d. All of these

Correct Answer: d. All of these

Detailed Solution: Relay is a mechanical/electrochemical switch . (Please refer to lecture 30@ 6:20)

QUESTION 15:

QUESTION 15:

Sensors can be neither analog nor digital.

a. True
b. False

Correct Answer: b. False

Detailed Solution: Sensors can be analog or digital. (Please refer to lecture 30 @ 3:20)

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

Introduction to Internet of Things

Assignment-Week 7

TYPE OF QUESTION: MCQ/MSQ

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

QUESTION 1:

Raspberry Pi is like a mini computer which can perform a wide range of general purpose tasks.

a. True

b. False

Correct Answer: a. True

Detailed Solution: Raspberry Pi devices act just like mini computers and can be configured to perform many things. Refer to the lectures on Raspberry Pi

---

QUESTION 2:

What is the complete form of GPIO pins on Raspberry Pi devices.

a. General Public Input/Output

b. Generative Purpose Input/Output

c. General Purpose Input/Output

d. Global Purpose Input/Output

Correct Answer: c. General Purpose Input/Output

Detailed Solution: GPIO stands for General Purpose Input/Output. Refer to any standard documentation on Raspberry Pi. Also visit (https://projects.raspberrypi.org/en/projects/physical-computing/1)

QUESTION 3:

The Python program which you execute on Raspberry Pi to read data from sensors and control actuators has the same syntax and style as any other Python program.

a. False

b. True

Correct Answer: b. True

Detailed Solution It does not matter for what a Python program is written, all Python programs follow the same syntax and style.

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:

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 6:

Consider the following Python code snippet. Assume the syntax is correct and all required libraries are imported

```
var  = 'Sensor@Actuator%Arduino'
pt = var.split('%')
print(pt)
```

What will be the output (See every detail, including the apostrophes carefully)?

a. ['Sensor','Actuator','Arduino']

b. ['Sensor@Actuator','Arduino']

c. ['Sensor','Actuator%Arduino']

d. ['Sensor@Actuator%Arduino']

Correct Answer: b. ['Sensor@Actuator','Arduino']

Detailed Solution: As per Python programming directives and the working of the split function(). Refer Python documentation and Lecture 32@26:00

QUESTION 7:

Which among the following functions do you use while using MATPLOTLIB to add title to a plot?

a. plot()

b. add()

c. label()

d. title()

Correct Answer: d. title()

Detailed Solution: The title(<name_of_title>) functions adds title to a plot while using matplotlib. Refer Lecture 32@12:00

QUESTION 8:

In traditional non software-defined network consisting of a network of switches, suppose OSPF is being used as the routing protocol. In this context which among the following is true.

a. All the switches execute OSPF distributively

b. Only one switch executes OSPF

c. No switch executes OSPF

d. All of these are true

Correct Answer: a. All the switches execute OSPF distributively

Detailed Solution: Traditional networks are distributive, hence all the switches of the network execute OSPF. Refer Lecture 33 from 3:50 onwards.

QUESTION 9:

In SDN, the Operating System (OS) is separated (i.e not strongly coupled) from the physical hardware for each switch.

a. True

b. False

Correct Answer: a. True

Detailed Solution: SDN separates the physical and logical plane of the switch. So OS (part of logical plane) is separated from the hardware (part of the physical plane) for each switch. Refer Lecture 33 from 9:20 onwards.

QUESTION 10:

Which among the following is a popular protocol implementing SDN?

a. OpenSwitch

b. OpenStack

c. OpenFlow

d. OpenEdge

Correct Answer: c. OpenFlow

Detailed Solution: OpenFlow by ONF is the most popular protocol implementing the principles of SDN. Refer to any standard documentation on OpwnFlow.

QUESTION 11:

With respect to Software Defined Networking (SDN), which among the following is true?

a. SDN couples the data plane and control plane.

b. SDN has no relation to either data plane or control plane

c. SDN separates the data plane and control plane.

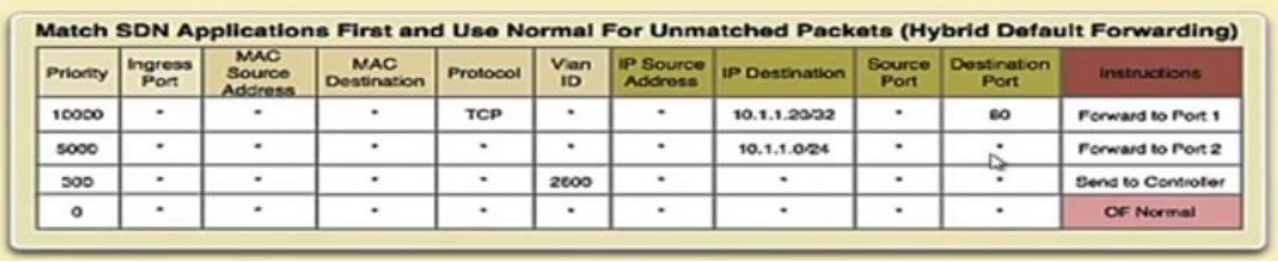
d. None of the stated.

Correct Answer: c. SDN separates the data plane and control plane

Detailed Solution: SDN separates the data plane and control plane. It is the fundamental principle of SDN. Refer Lecture 33 from 12:17 onwards, SDN Architecture.

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:

Suppose that there are two LANs, each configured to be SDN enabled with their own set of switches and controller. Which among the following directional APIs will be used for communication between the two controllers?

a. Northbound API

b. East-Westbound API

c. Southbound API

d. Northeastbound API

Correct Answer: b. East-Westbound API

Detailed Solution: East-Westbound APIs are responsible for communication between different SDN controllers and domains. Refer Lecture 34, APIs in SDN

QUESTION 14:

Which among the following is true?

a. Backup Controllers have no use is SDN

b. There is no difference between the main controller and backup controller

c. Backup controllers take over when the main controller goes down

d. It is not a good idea to keep backup controllers.

Correct Answer: c. Backup controllers take over when the main controller goes down

Detailed Solution: Backup Controllers are required to take over the network control when the main controller fails. Refer Lecture 34@8:24

QUESTION 15:

IoT being data intensive and having a lot of security concerns, it is a good idea to integrate SDN with IoT to mitigate many of these issues.

a. True

b. False

Correct Answer: a. True

Detailed Solution: SDN can be integrated with IoT to reap several benefits of both. Refer Lecture 35.

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

Introduction to Internet of Things

Assignment-Week 8

TYPE OF QUESTION: MCQ/MSQ

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

QUESTION 1:

Traditional Wireless Mobile Networks are cost expensive in terms of _____?

a. Only CAPEX

b. Only OPEX

c. Both CAPEX and OPEX

d. Neither CAPEX and OPEX

Correct Answer: c. Both CAPEX and OPEX

Detailed Solution: Traditional wireless mobile networks are cost expensive both with respect to capital expenditure (CAPEX) and Operational Expenditure (OPEX). Refer Lecture 36@2:45

QUESTION 2:

High mobility of users is one of the key challenges in rule placement for software defined wireless mobile networks.

a. True

b. False

Correct Answer: a. True

Detailed Solution: Dynamic user mobility restricts the ease with which rules can be placed for software defined wireless mobile networks. Refer Lecture 36@8:43

QUESTION 3:

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

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

Correct Answer: c. Mobi-Flow

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

---

QUESTION 4:

Cloud, Utility, Grid and _____ have been the major trends in computing

a. Clone
b. Cluster
c. Closure
d. Cloud

Correct Answer: b. Cluster

Detailed Answer: Cloud, Utility, Grid and Cluster computing are some of the major trends in computing. Please refer Lecture 37@5:43 onwards

---

QUESTION 5:

Cloud computing models allow different users to share the same physical resources?

a. True

b. False

Correct Answer: a. True

Detailed Solution: Cloud computing uses virtualization heavily and thus it allows different users to share the same underlying physical infrastructure.

QUESTION 6:

As per NIST Visual Model of Cloud Computing, 'Hybrid Cloud' model and PaaS model both fall in the same category.

a. True

b. False

Correct Answer: b. False

Detailed Solution: 'Hybrid Cloud' is an example of cloud deployment model while 'PaaS' is an example of cloud service model. Refer Lecture 37@13:28

QUESTION 7:

When you are accessing Google docs or Microsoft Word online for accessing the features of a document writing software from your browser without specifically installing them, which among the following cloud service models is the most appropriate one that you are using.

a. SaaS

b. PaaS

c. IaaS

d. DaaS

Correct Answer: a. SaaS

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

QUESTION 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:

Cloud services and resources should be rapidly _____ in order to achieve their required performance

a. entrusted
b. elastic
c. enterprise
d. None of the given

Correct Answer: b. elastic

Detailed Answer: Rapid elasticity is one of the key requirements for cloud computing paradigms and models. Refer Lecture 37@20:54

QUESTION 10:

Suppose that a start-up wants to enter into online book delivery business. It wants to create the user interface and the application by itself, but it does not have any networking or storage facility, so it wants to adopt the cloud computing practice. In this respect, which among the following cloud service models is most suitable for the start-up.

a. Only SaaS
b. Neither PaaS nor IaaS
c. Both PaaS and IaaS can be adopted
d. Neither SaaS, PaaS or IaaS

Correct Answer: c. Both PaaS and IaaS can be adopted

Detailed Answer: Since both IaaS and PaaS provides infrastructure and storage support to clients, either of PaaS or IaaS can be employed. Refer Lecture 38@3:00, comparision of different models.

QUESTION 11:

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 12:

Network, _____ and application level securities are the three aspects of cloud infrastructure securities.

a. Client

b. Web

c. Host

d. Wireless

Correct Answer: c. Host

Detailed Solution: Network, host and application level securities are the fundamental aspects of cloud infrastructure securities. Refer Lecture 39@16:42.

QUESTION 13:

When a new user logs into a cloud framework, the first thing that needs to be done is _____.

a. User should be authenticated

b. User should immediately be granted all the resources

c. User should log off

d. User should be penalized

Correct Answer: a. User should be authenticated

Detailed Solution: User authentication is one of the primary security issue and any user which logs into the cloud framework must first be authenticated. Refer Lecture 39@26:53.

QUESTION 14:

Service Level Agreements (SLAs) are mutually agreed by the client (customer) and cloud service provider (CSP) at the beginning. With respect to SLAs, what are the views that SLAs provide?

a. Customer Point of View

b. CSP Point of View

c. Both Customer and CSP Point of View

d. Neither Customer nor CSP Point of View

Correct Answer: c. Both Customer and CSP Point of View

Detailed Solution: SLAs provide both the customer point of view and the CSP point of view between the customer and the CSP. Refer Chapter 10 (Page 245) of “Introduction to IoT” by Sudip Misra, Anandarup Mukherjee, Arijit Roy, Cambridge University Press.

QUESTION 15:

CloudAnalyst simulation tool provides GUI and is written on top of CloudSim modules.

a. Yes

b. No

Correct Answer: a. Yes

Detailed Solution: CloudAnalyst is built on top of CloudSim and also provides a GUI. Refer Lecture 40@12:02 onwards.

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

Introduction to Internet of Things

Assignment-Week 9

TYPE OF QUESTION:MCQ/MSQ

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

QUESTION 1:

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

a. Horizon

b. Glance

c. Neutron

d. None of these

Correct Answer: a. Horizon

Detailed Solution: Horizon is the dashboard of OpenStack which provides the GUI and from where you can access other components. Please refer Lecture 41@3:54

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:

Sensor cloud is simply dumping and organizing of sensor data on cloud computing platforms.

a. True

b. False

Correct Answer: b. False

Detailed Solution: Sensor cloud incorporates many aspects and not simply dumping of senor data over cloud platforms. Refer Lecture 42@3:45 onwards

---

QUESTION 4:

Which among the following are limitations of traditional Wireless Sensor Networks (WSNs)?

a. Procurement Issues

b. Deployment Issues

c. Maintenance Issues

d. All of the given

Correct Answer: d. All of the given

Detailed Solution: For traditional WSNs, procurement, deployment and maintenance are all critical issues that needs to be taken care of. Refer Lecture 42@9:49 onwards.

QUESTION 5:

In a typical sensor cloud architecture, the sensor cloud infrastructure that provides the virtualization lies _____

a. At the same layer as physical sensor devices
b. At the application layer
c. In between the physical sensor layer and the application layer
d. Sensor cloud does not support virtualization

Correct Answer: c. In between the physical sensor layer and the application layer

Detailed Answer: In a typical sensor cloud architecture, the sensor cloud infrastructure that provides the virtualization lies in between the physical sensor layer and the application layer. Refer Lecture 42@12:00 onwards.

QUESTION 6:

Generally speaking, Sensor Cloud Service Providers (SCSPs) are also always the owners of the physical sensors

a. Yes
b. No

Correct Answer: b. No

Detailed Solution: SCSPs are providers of the virtualized sensor services, but they may not the owners of the physical sensors in a typical deployment. Refer Lecture 42, 'Actors in Sensor-cloud'.

QUESTION 7:

In a typical sensor cloud architecture with virtualization, one virtual sensor can be associated with how many physical sensors?

a. Only one
b. One or more than one
c. None
d. Only two

Correct Answer: b. One or more than one

Detailed Solution: One instance of a virtual sensor in sensor cloud architecture can be mapped with one, two or more physical sensors below. Refer Lecture 43, Optimal composition of virtual sensors

---

QUESTION 8:

Sensor virtualization aims to achieve more _____ in providing sensor based services

a. Complexity

b. Flexibility

Correct Answer: b. Flexibility

Detailed Solution: Sensor virtualization and sensor cloud architecture are designed to provide more flexibility and convenience than traditional sensor based services. Refer to the lectures on Sensor Cloud and its motivation closely.

QUESTION 9:

Suppose that you want to start a business to provide some IoT based application, but you do not have the means to develop the application layer logic, neither you have the means to purchase and deploy physical sensors. You can however, rent cloud servers for use and write interface logic for interfacing with other modules. Which among the following actors will be the most suitable for you?

a. Physical sensor owner
b. Application layer developer
c. Sensor Cloud Service Provider (SCSP)
d. You cannot start the business

Correct Answer: c. Sensor Cloud Service Provider (SCSP)

Detailed Answer: SCSPs provide the sensor virtualization layer in between the application layer and the physical sensor layer and thus this is the best business model as per the requirements and constraints given. Refer to the standard architecture of sensor cloud and utility of SCSPs.

QUESTION 10:

Which among the following is implemented along with sensor cloud to make its services and performance better?

a. Cashing

b. Caching

c. Casing

d. Calling

Correct Answer: b. Caching

Detailed Solution: Caching is very important in sensor cloud and is implemented along with sensor cloud to make the performances better. Refer Lecture 43@17:38 onwards.

QUESTION 11:

Which among the following cases is most likely to reduce the overall price of sensor-cloud implementation provided that the data traverses through multiple sensor hops starting from the origin sensor to the sink node, and provided that all owners are honest and charge for only what is required?

a. If physical sensors are owned by multiple owners with high profit margin

b. If all physical sensors are owned by a single owner with uniform profit margin

Correct Answer: b. If all physical sensors are owned by a single owner with uniform profit margin

Detailed Solution: If all the physical sensors are owned by a single owner, then the single owner will charge an uniform price for data traversing through the sensors. On the other hand, if multiple sensor owners are there, different owners will charge different rates, which may increase the price. Refer pricing in sensor-cloud, Lecture 43@25:40 onwards.

QUESTION 12:

Fog computing is aimed to replace cloud computing completely and has no scope for integration with cloud

a. True

b. False

Correct Answer: b. False

Detailed Solution: Fog computing is designed to assist and compliment cloud based technologies in providing better services, not remove cloud all together. Refer Lecture 44@3:46 onwards, Introduction to Fog, especially how it is connected to cloud computing.

QUESTION 13:

Suppose data from an IoT device first goes to Fog layer for some basic processing, after which it goes to Cloud layer for advanced processing, then the processed data comes back to the Fog layer and then, it finally comes back to the origin sensor node. In the return journey no processing of data takes place anywhere, just transfer of data takes place. If 'Tf' is the time taken by the data to travel from sensor to fog and vice versa, and 'Tc' is the time taken by the data to travel from fog to cloud and vice versa, 'Tfp' is the data processing time at fog and 'Tcp' is the data processing time at cloud, what is the total round trip time 'T' taken by data starting from the origin sensor node, processing the data and then back to the sensor node after being processed.

a. T = Tf + Tc + Tfp + Tcp

b. b. T = Tf + Tc

c. T = 2(Tf + Tc) + Tfp + Tcp

d. T = 4(Tf + Tc + Tfp + Tcp)

Correct Answer: c. T = 2(Tf + Tc) + Tfp + Tcp

Detailed Solution: Since data comes back to the origin sensor node, the traversal latency Tf and Tc will be counted twice. But, since processing takes place only once during onward journey, processing delay is only one time. Therefore, T = 2(Tf + Tc) + Tfp + Tcp. Refer to the lecture on cloud latency, Lecture 44@14:28 onwards.

QUESTION 14:

Consider the standard Fog computing architecture. In which of the following layer will 'very time sensitive data' be processed?

a. Nearest fog node

b. Distant aggregate fog node

c. Cloud

d. Does not matter

Correct Answer: a. Nearest fog node

Detailed Solution: Since the data is very time sensitive, it is required that the nearest fog node processes the data so that immediate action can taken. This is the benefit of having fog computing. Refer to Working of Fog, Lecture 45@13:20 onwards.

QUESTION 15:

"Network, Accelerator, Compute and Storage" constitute the part of which view of fog computing architecture, as defined by *OpenFog Consortium Architecture Working Group?*

a. System View

b. Node View

c. Software View

d. None of these

Correct Answer: b. Node View

Detailed Solution: Fog Computing Architectural framework has several views, node, system and software among them. Network, Accelerator, Compute and Storage" fall under Node View. Refer Chapter 11 (Page 260) of "Introduction to IoT" by Sudip Misra, Anandarup Mukherjee, Arijit Roy, Cambridge University Press, 2021.

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

NPTEL Online Certification Courses

Indian Institute of Technology Kharagpur

Introduction to Internet of Things

Assignment-Week 10

TYPE OF QUESTION:MCQ/MSQ

Number ofquestions:15 **Total marks: 15 X 1= 15**

QUESTION 1:

Data fusion enables optimum utilization of massive data gathered from multiple sources.

a. True
b. False

Correct Answer: a. True

Detailed Solution: Data fusion enables optimum utilization of massive data gathered from multiple sources. (Please refer Lecture 47@5:40)

QUESTION 2:

Which of the following is a stage in data fusion?

a. Decision level
b. Feature level
c. Pixel level
d. All of the above

Correct Answer: d. All of the above

Detailed Solution : Decision level, feature level, pixel level and signal level are the four stages of data fusion. (Please refer Lecture 47@11:00)

QUESTION 3:

Which of the following is one of the challenges of Data fusion?

a. Imperfection
b. Conflicts
c. Ambiguity
d. All of the above

Correct Answer: d. All of the above

Detailed Solution : The challenges of data fusion involves Imperfection, Conflicts and Ambiguity. (Please refer Lecture 47@9:16)

QUESTION 4:

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

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

Correct Answer: a. Belief function

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

QUESTION 5:

DLNA stands for Digital Living Network Alliance.

a. True
b. False

Correct Answer: a. True

Detailed Solution: DLNA stands for Digital Living Network Alliance. (Please refer Lecture 48@13:45)

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 HAN standards?

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

Statement II: Network layer is defined by Zigbee.

Statement III: Application layer is defined by IEEE802.15.4

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

Correct Answer: a. Statements I and II

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

QUESTION 8:

Which of the following are true about X-10?

Statement I: It allows remote control of compliant transmitters.

Statement II: It has low speed and data rate.

Statement III: It is adopted by GE.

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: X-10 allows remote control of compliant transmitters, has low speed and data rate and is adopted by GE.

(Please refer Lecture 48@17:04)

QUESTION 9:

Fill in the blank.

_____enables vehicles to wirelessly share a diverse range of information.

a. Local area network
b. V2X Paradigm
c. V2A Paradigm
d. Metropolitan area network

Correct Answer: b. V2X Paradigm

Detailed Solution: V2X enables vehicles to wirelessly share a diverse range of information
(Please refer Lecture 49@10:48)

QUESTION 10:

Which of the following is a property of Vehicular Ad-hoc Networks?

a. Is based on DSRC

b. Is based on WAVE

c. Guaranteed low latency

d. All of these

Correct Answer: d. All of these

Detailed Solution: VANETs are based on DSRC and WAVE. They also have guaranteed low-latency in mobile environments. (Please refer Lecture 49@16:50)

QUESTION 11:

Knob is a switch type of INN.

a. True

b. False

Correct Answer: a. True

Detailed Solution: Knob is a switch type of INN. (Please refer Lecture 49@23:56)

QUESTION 12:

Which of the following is responsible for central coordination in Body-brain architecture?

a. Body
b. INN
c. Spinal cord
d. None of these

Correct Answer: d. None of these

Detailed Solution: The brain is responsible for central coordination in Body-brain architecture (Please refer Lecture 49@23:03)

QUESTION 13:

Which of the following stands for DSRC?

a. Directed Short Range Communication
b. Dedicated Short Range Communication
c. Directed Small Range Communication
d. Dedicated Small Range Communication

Correct Answer: b. Dedicated Short Range Communication

Detailed Solution: DSRC stands for Dedicated Short Range Communication (Please refer Lecture 50@7:27)

QUESTION 14:

Ad-hoc is a domain of VANET.

a. True
b. False

Correct Answer: a. True

Detailed Solution: Ad-hoc is a domain of VANET. (Please refer Lecture 50@14:12)

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

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*************

NPTEL Online Certification Courses

Indian Institute of Technology Kharagpur

Introduction to Internet of Things

Assignment-Week 11

TYPE OF QUESTION:MCQ/MSQ

Number ofquestions:15 **Total marks: 15 X 1= 15**

QUESTION 1:

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

a. Electricity with a brain
b. Energy internet
c. Electronet
d. All of these

Correct Answer: d. All of these

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

QUESTION 2:

Smart Grid follows which type of the flow of energy?

a. Bidirectional

b. Unidirectional

c. All of these

d. None of these

Correct Answer: a. Bidirectional

Detailed Solution: Smart grid is a modernized grid that enables bidirectional flow of energy. (Please refer Lecture 51@9:43)

QUESTION 3:

Which of the following is not a benefit associated with smart grids?

a. Efficient transmission of electricity
b. Lower electricity rates
c. Unreliable and insecure electricity
d. Improved security

Correct Answer: c. Unreliable and insecure electricity

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 component of smart grid communication?

a. Gateways
b. Smart meters
c. MDMSs
d. All of these

Correct Answer: d. All of these

Detailed Solution: The components of Smart Grid are Smart meters, Gateways, DAUs and MDMSs (Please refer Lecture 52 @12:16)

QUESTION 5:

Fill in the blank.

_____ can be used as an energy source in on-peak hours.

a. PMUs
b. DAUs
c. PEVs
d. None of these

Correct Answer: c. PEVs

Detailed Solution: PEVs or Plug-In Electric Vehicles can be used as an energy source in on-peak hours(Please refer Lecture 52 @6:29)

QUESTION 6:

Which of the following is a type of Dynamic System Attacks?

a. Replay Attacks
b. Dynamic data injection attacks
c. Covert attacks
d. All of these

Correct Answer: d. All of these

Detailed Solution: Replay Attacks, Dynamic data injection attacks and Covert attacks are all types of Dynamic System Attacks (Please refer Lecture 52@19:55)

QUESTION 7:

Which of the following statements are true about gateways?

Statement I: Each gateway connects a few closely located smart meters.

Statement II: Gateways communicate mostly based on WiFi.

Statement III: They help in two-way communication.

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: The gateways connect a few closely located smart meters, communicate mostly on WiFi and help in two-way communication. (Please refer Lecture 52@14:11)

QUESTION 8:

Fill in the blank.

_____ is a centralized coordinator for smart grid communication.

a. Gateway
b. Smart meter
c. PMU
d. MDMS

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 (Please refer Lecture 52@12:35)

QUESTION 10:

Fill in the blank. IIoT is a network of_____.

a. Physical objects

b. Systems

c. Platforms

d. All of the above

Correct Answer: d. All of the above

Detailed Solution: IIoT is a network of physical objects, systems, platforms and applications (Please refer Lecture 53@15:24)

QUESTION 11:

IIoT is based on Rip & 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 1st Revolution?

a. Mass production
b. Internet evolution
c. Automation
d. None of these

Correct Answer: d. None of these

Detailed Solution: Mass production, internet evolution, automation happened in forth revolution. (Please refer Lecture 53@10:06)

QUESTION 13:

Which of the following is a challenge of IIoT?

a. Worker health and safety
b. Environmental production
c. Optimized operations
d. All of these

Correct Answer: d. All of these

Detailed Solution: Worker health and safety, environmental production and optimized operations are all the safety challenges of IIoT. (Please refer Lecture 54@15:15)

QUESTION 14:

Monitoring and restoration of the traditional electrical grid is done manually.

a. True
b. False

Correct Answer: a. True

Detailed Solution: Monitoring and restoration of the traditional electrical grid is done manually (Please refer Lecture 51@5:34)

QUESTION 15:

What is Hadoop used in?

a. Distributed processing of large datasets
b. Large clusters of computers
c. All of these
d. None of these

Correct Answer: c. All of these

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

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

Introduction to Internet of Things

Assignment-Week 12

TYPE OF QUESTION: MCQ/MSQ

Number ofquestions: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:

Which of the following is a principle of Qualitative analysis?

a. Notice things
b. Think about things
c. Collect things
d. All of these

Correct Answer: d. All of these

Detailed Solution: The three principles of Qualitative analysis are: Notice things, think about things and collect things. (Please refer Lecture 56@4:12)

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 process by which numerical data is analyzed is known as _____.

a. Qualitative analysis

b. Quantitative analysis

c. None of these

d. All of these

Correct Answer: b. Quantitative analysis

Detailed Solution: Quantitative analysis is the process by which numerical data is analyzed. (Please refer Lecture 56@4:47)

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:

Contingency table is also known as?

a. Cross tabulation

b. Cross table

c. All of these

d. None of these

Correct Answer: c. All of these

Detailed Solution: Contingency table is also known as Cross tabulation and Cross table. (Please refer Lecture 56@14:36)

QUESTION 9:

Advances in sensor and connectivity have disabled preventive care.

a. True
b. False

Correct Answer: b. False

Detailed Solution: Advances in sensor and connectivity have disabled preventive care. (Please refer Lecture 58@4:22)

QUESTION 10:

Which of the following is a feature of IoT Healthcare?.

a. Non-invasive monitoring
b. Cloud-based analytics
c. Wireless transmission
d. All of these

Correct Answer: d. All of these

Detailed Solution: Non-invasive monitoring, Cloud-based analytics and Wireless transmission are all types of IoT healthcare. (Please refer Lecture 58@12:36)

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:

Which of the following is the advantage of activity monitoring?

a. Hard integration

b. Long term monitoring

c. Expensive

d. None of these

Correct Answer: b. Long term monitoring

Detailed Solution: Long term monitoring is one of the advantages of Activity monitoring. (Please refer Lecture 59@16:17)

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 is true for in-place activity monitoring data analysis?

a. Low power

b. Good network connection required

c. On-device

d. Group-based analytics

Correct Answer: c. On device

Detailed Solution: In-place activity monitoring data analysis is on-device and power intensive (Please refer Lecture 59@20:10)

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

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*************