NPTEL Online Certification Courses

Indian Institute of Technology Kharagpur

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:

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

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

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

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

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

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

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

QUESTION 2:

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

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

Correct Answer: a. Channel Hopping and Channel Blacklisting

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

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

QUESTION 3:

State True or False

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

a. True
b. False

Correct Answer: a. True

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

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

QUESTION 4:

At the MAC layer –

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

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

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

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

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

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

QUESTION 5:

NFC works on the principal of

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

Correct Answer: b. Magnetic Induction

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

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

QUESTION 6:

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

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

Correct Answer: a. Ad-hoc Piconets

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

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

QUESTION 7:

Class 2 Bluetooth radios have a range of about?

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

Correct Answer: c. 10 m

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

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

QUESTION 8:

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

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

Correct Answer: b. Booking

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

- Inquiry

- Paging
- Connection

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

QUESTION 9:

Zwave can support _____ number of nodes in a network?

a. 232
b. 233
c. 234
d. 235

Correct Answer: a. 232

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

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

QUESTION 10:

Topologies allowed in ISA 100.11A are?

a. Ring Only
b. Mesh and Hybrid
c. Mesh and Ring
d. Mesh and Star/Tree

Correct Answer: d. Mesh and Star/Tree

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

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

QUESTION 11:

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

a. MicronOS
b. TinyOS
c. Both (a) and (b)
d. None of these

Correct Answer: b. TinyOS

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

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

QUESTION 12:

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

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

Correct Answer: b. Be non-autonomous

Detailed Solution: Constraints on sensor nodes –

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

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

QUESTION 13:

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

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

Correct Answer: b. Badly Failed Nodes

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

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

QUESTION 14:

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

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

Correct Answer: c. CoRD and CoRAD

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

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

QUESTION 15:

Full form of WBAN is?

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

Correct Answer: a. Wireless Body Area Network

Detailed Solution: Wireless Body Area Network (WBAN).

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

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