Time available: 90 minutes

Sequence Number
(92)

correct answer 2 points, wrong answer – $\frac{2}{3}$ points, omitted answer 0/30

Family Name, Given Name (CAPITAL LETTERS) student ID (matricola) :

1. In the most general case based on the IoT system infrastructure view a gateway can be connected to

   ○ a) Sensors, Actuators, Things and Gateways
   ● b) Sensors and Actuators
   ○ c) Sensors, Actuators and Things
   ○ d) Sensors

   A

2. During the process of node commissioning and provisioning that follows installation, nodes are issued system identities and security credentials necessary for

   ○ a) authentication and for secure operation upon their activation in the IP-based system.
   ○ b) authentication and for secure operation upon their activation in the wired system.
   ○ c) authentication and for secure operation upon their activation in the wireless system.
   ○ d) authentication and for secure operation upon their activation in the system.

   D

3. Aliasing errors results from

   ○ a) Noise in in the digital circuitry
   ○ b) Insufficient memory of the Digital signal Processing system
   ● c) Insufficient quantization levels
   ○ d) Insufficient sampling rates

   D

4. Which of the following is not an industrial bus or protocol

   ○ a) CAN bus
   ● b) Profibus
   ○ c) Modbus
   ○ d) Fieldbus

   A

5. Serialization defines

   ○ a) how individual bits and bytes appear in actual transfers over IP-based communication links
   ○ b) how individual bits and bytes appear in actual transfers over wireless communication links
   ● c) how individual bits and bytes appear in actual transfers over industrial protocols
   ○ d) how individual bits and bytes appear in actual transfers over communication links

   D

6. In push notifications,

   ○ a) a message is explicitly requested from the source (IoT server) by its recipient, an IoT client
   ○ b) the data source and the gateway acting on its behalf send data messages to an agreed point when the specified conditions are met

   B

c) the data exchange is accomplished via an API-styled "get data" for a specific data source or a group of related ones

○ d) some synchrony between the sender and the receiver is needed

7. The watchdog timer (WDT)

○ a) is usually present in any microprocessor

● b) is usually present only in general-purpose CPUs

○ c) cannot be included in microcontrollers designed for embedded systems

○ d) is included in many microcontrollers designed for embedded systems

8. Key functions of the network layer does not include

○ a) Addressing

○ b) Segmentation

● c) Transmission of digital frames between two endpoints connected by the physical layer

○ d) Routing

9. Low-Power and Lossy Networks

○ a) have a constant (typically high) packet error rate

○ b) use nodes all of the same type

○ c) allow nodes to sleep

○ d) are not used in IoT

10. Maximum payload size per packet in IEEE 802.15.4 networks is

● (a) 127 bytes

○ b) 128 bytes

○ (c) 2048 bytes

○ d) unlimited as far as size is concerned

11. IEEE 802.15.4 IP Based Networks include

● (a) Thread

○ b) ZigBee

○ (c) Bluetooth

○ (d) LoRaWAN

12. In a LoRaWAN network if you aim at lowest latency for a node, you select a node

● (a) Class C

○ b) Class B

○ (c) Class A

○ (d) Class A with ADR

13. In terms of security, CoAP communications can be secured

○ (a) at the transport layer, such as DTLS for UDP, only

○ (b) at the link layer in conjunction with IEEE 802.5.14 only

● (c) Using IPsec

○ (d) at the transport layer, such as DTLS for UDP, as well as at the link layer in conjunction with IEEE 802.5.14

14. With reference to the "IoT cloud components" ingested data may go through the *cold path* for

○ (a) storage

correct answer 2 points   wrong answer $-\frac{2}{3}$ points   omitted answer 0/30