Estat	Acabat
Començat el	dilluns, 22 de setembre 2025, 17:02
Completat el	dilluns, 22 de setembre 2025, 17:16
Durada	13 minuts 49 segons
Qualificació	Encara no s'ha qualificat

Pregunta 1

Correcte

Puntuació 1,00 sobre 1,00

Match each network topology with its key characteristic:

Mesh — Redundant links, robust but costly

Star — Hub-and-spoke, fragile hub

Tree — Hierarchical aggregation, potential bottlenecks

La resposta és correcta.

La resposta correcta és: Mesh → Redundant links, robust but costly, Star → Hub-and-spoke, fragile hub, Tree → Hierarchical aggregation, potential bottlenecks.

Pregunta 2

Correcte

Puntuació 1,00 sobre 1,00

Which component of a sensor node is responsible for capturing physical phenomena like temperature or light?

a. Sensor unit

b. Communication unit

c. Power unit

d. Processing unit

La resposta és correcta.

La resposta correcta és: Sensor unit

Pregunta 3

Correcte

Puntuació 1,00 sobre 1,00

Fill in the blank:

The communica unit of a sensor node consumes the most energy.

La resposta correcta és: communication

Pregunta 4

Parcialment correcte

Puntuació 0,50 sobre 1,00

Arrange the layers in increasing scale:

- ✓ Node
- ✗ Network
- ✗ Cluster
- ✓ System

La resposta és parcialment correcta.

Elements correctes: 2
Elements incorrectes: 2
Tipus de qualificació: Posició absoluta

Detalls de la qualificació: 2 / 4 = 50%

Aquestes són les puntuacions de cada element en aquesta resposta:

1. 1 / 1 = 100%
2. 0 / 1 = 0%
3. 0 / 1 = 0%
4. 1 / 1 = 100%

L'ordre correcte d'aquests elements és el següent:

1. Node
2. Cluster
3. Network
4. System

Pregunta 5

Completa

Puntuat sobre 1,00

What is the main trade-off when using duty cycling in sensor networks?

A sensor with a high duty-cycle gets a lot of data, which is crucial for things that change quickly (traffic, temperature in an oven, ...). The drawback is that it consumes more energy and needs to send (and manage, and store) more data. A low duty-cycle is the opposite: we take samples very far apart from time (e.g. humidity in plants).

Pregunta 6

Completa

Puntuat sobre 1,00

Explain why graph abstraction is useful in IoT sensor network design. Give one example of a metric it helps evaluate.

Graph abstraction is useful to see the path data needs to take. It predicts possible single-point-of-failures, bottlenecks, and alternative routes. A metric that helps evaluate graphs is the minimum number of nodes a packet needs to go through to reach the destination. A high number will mean that there's more latency.

Pregunta 7

Completa

Puntuat sobre 1,00

Name two industrial or societal applications of IoT sensor networks and explain briefly why they benefit from this technology.

Humidity in corps management. Having a lot of distributed sensors and managing them in clusters (or whatever technique) allows to pick up data from multiple points of the soil instead of a few, giving more accurate maps of where we need to water more the plants.

Traffic management. Interconnecting traffic lights allows for synchronization, which reduces stop times, which augments the road capacity. This communication can be done using mesh networks to add redundancy.

Pregunta 8

Completa

Puntuat sobre 1,00

In terms of data aggregation, what is the main advantage and the main drawback of compressing data at cluster heads?

Compressing data at cluster heads helps reducing the payload to be sent to the upper layer. This prevents overloading the network, and reducing infrastructure costs.

The drawback is that this needs some computation, and clusters may have limited compute power depending on what needs to be done.

Pregunta 9

Completa

Puntuat sobre 1,00

What is the key limitation of simulation in IoT network design, and why should results be interpreted with caution?

The main difference between real-world and simulated scenarios is the lack (or presence) of interference. Simulators can introduce noise to signals, but it will never be as random as it is in real-life: it will depend on external factors hard to model. E.g. an office nearby, a highway, a mountain, etc.