

# Internet of Things - CSE3009

## FAT Question Bank

**Question-1.** Illustrate how to integrate and communicate with diverse things using WOT for a smart door knob.

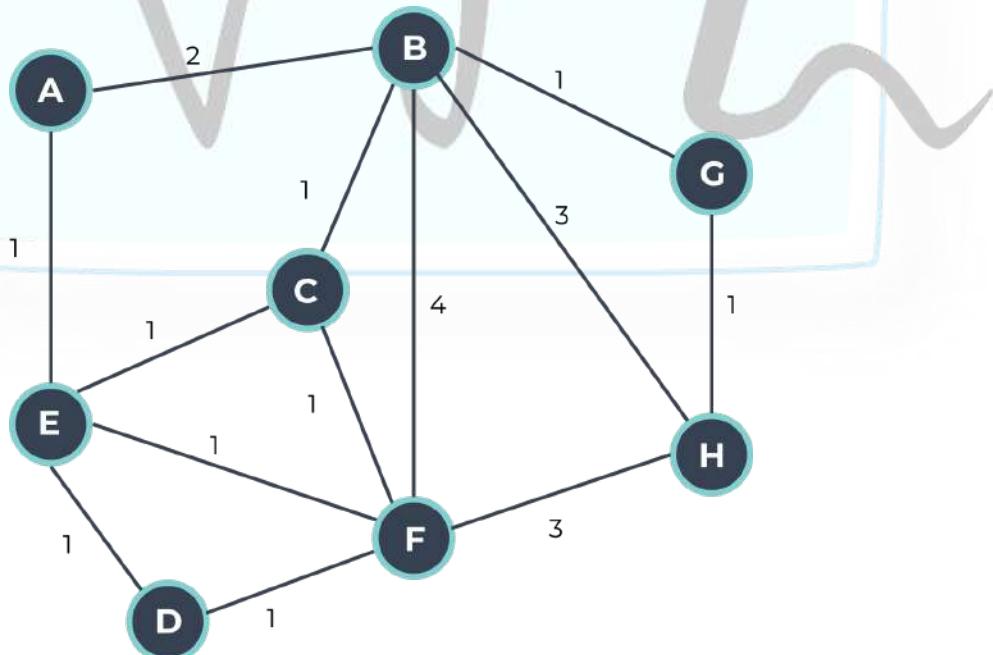
**Question-2.** Design a smart postbox which tells/alerts you about the new envelops dropped inside the postbox by the mail man with the help of Bluetooth module. The system should also keep track of the count of envelops dropped. Give detailed description of the sensors used and other hardware required. Draw the circuit diagram for the setup and write the Arduino code.

**Question-3.** For a smart vehicle system, discuss on creating a cluster with comparison of different cluster architectures. Address the following points and mention which cluster architecture will be best suited.

- i. Assistance to drivers during bad weather or low visibility
- ii. Detection of bad driving patterns or driving under the influence of substances.
- iii. Auto alert generation during crashes.

**Question-4.** Design a simple RFID based tracking system to track and monitor equipment, vehicles, and staff on remote and rugged worksites with industry-leading reliability, explain its functionalities and challenges in detail.

**Question-5.** Consider a set of nonstoring nodes deployed in a location for periodically sending the temperature readings. Illustrate the procedure for the temperature sensor nodes to get connected to LBR (Node A is considered as LBR) and construct the DODAG using RPL.



**Question-6.** How can you keep your home protected by using smart security alarm? Discuss on the following,

- i. The major need to perform this monitoring
- ii. What are the different IoT solutions?
- iii. Benefits, bandwidth requirement and technology involved in the system
- iv. Operational issues that can arise

**Question-7.** Imagine you are building a solution for smart tourism, where the system has to monitor the water quality in pools, sea water quality measurement and water level measurement in streams/rivers. Illustrate how you can implement the system using a request/response model with REST API.

**Question-8.** Build an automation system for chemical leakage monitoring in water plants using a multimodal sensing mechanism. Elaborate on the topology used for building such systems with bluetooth communication.

**Question-9.** Write an arduino sketch to check whether the fruit is ripe or not on a daily basis and display the amount of ripeness in the serial monitor. Make an LED to glow if ripe.

**Question-10.** Design a layout for M2M communication in the retail sector, describing the three layers and end to end solutions.

**Question-11.** Analyze critically, how WSN and web of things can be integrated in a heterogeneous environment. Discuss on the intelligent descriptive decision making process that can be used in heterogeneous sensor data. (Choose an application of your choice)

**Question-12.** Discuss on a single hop cluster head selection algorithm for target tracking using sensor camera. Consider 4 sensor cameras that are involved in the network. Discuss the number of rounds (n) required to choose the best cluster head. Determine the nodes that will become a cluster head at round 3 and 4. (make necessary assumptions)

**Question-13.** Comment on the data driven business model for any IoT application and assess the severity of threat and risk to the data generated by the system

**Question-14.** Explain the functions and architecture of the protocol which adapts the IEEE 802.15.4 standard?