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Sheet for Internet of Things (IOT)

Course code: CS492

اسم الطالب : دعاء أشرف حسن

What is the Internet of Things (IoT)?

The answer: IoT is a network of physical objects embedded with sensors, software, and other technologies to connect and exchange data with other devices over the internet.

1. List five of IoT domains?

The answer: 1) Smart Homes 2) Healthcare 3) Industrial IoT 4) Smart Cities 5) Transportation

2. What is the difference between M2M and IoT?

The answer: M2M (Machine to Machine) is direct communication between devices, while IoT connects devices through the internet and enables advanced analytics and decision making.

3. What is the difference between WSN and IoT?

The answer: WSN (Wireless Sensor Network) focuses on sensing and data collection, while IoT includes sensing plus communication, processing, and actions.

4. List 5 benefits of IoT to organizations?

The answer: 1) Improved efficiency 2) Cost reduction 3) Better decision making 4) New business opportunities 5) Enhanced customer experience

5. IoT applications are categorized into four main areas, write them with examples?

The answer: 1) Consumer IoT (Smart homes) 2) Commercial IoT (Healthcare monitoring) 3) Industrial IoT (Manufacturing automation) 4) Infrastructure IoT (Smart cities)

6. List 3 benefits of AI to IoT?

The answer: 1) Enhanced analytics 2) Automated decision making 3) Predictive maintenance

7. List Four Main Components of IoT Systems?

The answer: 1) Sensors/Devices 2) Connectivity 3) Data Processing 4) User Interface

8. Define: sensor, actuator, controller, Smart things?

The answer: Sensor: detects physical changes. Actuator: performs actions. Controller: manages device operations. Smart things: objects with sensing, processing, and communication capabilities.

9. List five Disadvantages of IoT?

The answer: 1) Security risks 2) Privacy issues 3) High cost 4) Complexity 5) Data overload

10. What are the main phases of Smart City Development Model?

The answer: 1) Planning 2) Infrastructure development 3) Service deployment 4) Optimization

11. What is the difference between Digital objects and Physical objects?

The answer: Digital objects exist in virtual space, while physical objects exist in the real world.

12. List five Classifications of Smart Objects?

The answer: 1) Sensors 2) Actuators 3) Smart appliances 4) Wearables 5) Connected vehicles

13. What are The Main Components of a Smart Object?

The answer: 1) Sensors 2) Processor 3) Actuator 4) Communication module

14. What is the difference between Sensors and Actuators?

The answer: Sensors collect data, while actuators perform actions based on data.

15. What are the Classification of Sensors?

The answer: 1) Temperature sensors 2) Proximity sensors 3) Pressure sensors 4) Light sensors 5) Motion sensors

16. What is the difference between Cloud, Fog and Edge?

The answer: Cloud is centralized data processing, Fog is intermediate processing near devices, Edge is processing directly at the device.

17. What is the Networking Protocols and what is benefits to IoT?

The answer: Networking protocols define rules for data exchange; they enable connectivity, interoperability, and secure communication in IoT.

18. List five of Networking Protocols that used for IoT systems?

The answer: 1) MQTT 2) CoAP 3) HTTP 4) Bluetooth 5) Zigbee

19. What is MQTT Protocol?

The answer: MQTT is a lightweight messaging protocol used in IoT for efficient communication over low-bandwidth networks.

20. What is NFC Protocol?

The answer: NFC (Near Field Communication) is a protocol for short-range communication (typically less than 4 cm) between devices.

21. What is a Wireless Networking Protocol that used for IoT systems and list three common ones?

The answer: Wireless protocols enable wireless communication. Examples: 1) Wi-Fi 2) Bluetooth 3) Zigbee

22. List three Challenges of IoT Systems?

The answer: 1) Security 2) Scalability 3) Interoperability

23. What is Arduino Uno?

The answer: Arduino Uno is an open-source microcontroller board used for building electronic projects.

24. The difference between Microcontroller and Arduino?

The answer: A microcontroller is a chip, while Arduino is a development board with a microcontroller and additional components for easy programming and prototyping.

True or false:

1. T - For IoT, devices do not necessarily rely on an internet
2. T - In IoT, there is one kind of devices gathering information called sensors
3. T - IoT improve connectivity and decision-making in AI systems
4. T - IoT Physical Layer is composed of two parts: sensors and actuators
5. F - Eye trackers are from output devices of IoT
6. T - Businesses that don't start using IoT soon might be left behind
7. F - WIFI Shield and Bluetooth Module are from Process Layer for IoT Architecture
8. T - The wide-use of IoT will result in a significant loss of mundane jobs
9. T - Edge and fog computing layers help in filtering, analyzing, and managing data
10. F - Cloud computing is used to process data near the physical object that creates the data
11. T - IoT is the intersection of the Internet, Things and sensors

12. T - AI improve connectivity and decision-making in IoT systems

13. F - Weather stations collect various data from the sensors and send it to the environment

14. T - IoT agriculture sensors that can be attached to animals on a farm to monitor their health

15. F - Wearable devices are always connected to the Internet

16. T - The big data generated at the edge requires more network bandwidth to transfer data to the cloud

17. T - Transport protocols ensure that data is reliably transmitted and received

18. F - NFC is a set of protocols with a range of no more than 4 meters (it's about 4 cm)

19. T - Bluetooth is a wireless technology that uses radio frequencies to exchange data over short distances

20. T - Any computing device with storage capabilities and network connectivity can form a fog node