ASSIGNMENT – 4

1. What is the primary purpose of SCADA in industrial applications?

    a. Control and monitoring of physical processes
    b. Designing sensors for manufacturing
    c. Manual intervention in industrial processes
    d. Eliminating all automation

Answer: (a)

Justification: Please refer to Slides 24 of Lecture 4 of Week 4

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2. What is the function of WSANs in industrial processes?

    a. Manual sensor installation
    b. Integration of sensors and actuators with wireless networks
    c. Replacing traditional data systems
    d. Eliminating automated controls

Answer: (b)

Justification: Please refer to Slide 26 of Lecture 4 of Week 4

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3. What does cybersecurity primarily aim to protect?

    a. Physical security
    b. Internet-connected systems, including hardware, software, and data
    c. Standalone software applications
    d. Manual data handling systems

Answer: (b)

Justification: Please refer to Slides 1, 2 of Lecture 1 of Week 4

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4. Which industrial sector benefits from advanced analytics using the Industrial Internet?

    a. Healthcare

b. Oil and Gas
c. Rail Transportation
d. All of these

Answer: (d)

Justification: Please refer to Slides 15 - 22 of Lecture 3 of Week 4

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5. Cyber Physical systems comprises which of the following layers?

a. Control Layer, Cognitive Layer, Cyber Layer, Conversion Layer and Connection Layer
b. Sensing Layer, Edge Computing Layer, Cloud Layer, Decision-Making Layer, and Execution Layer
c. Detection Layer, Data Processing Layer, Connectivity Layer, Automation Layer, and User Interaction Layer
d. Edge Computing Layer, Automation Layer, Detection Layer, Decision-Making Layer, and Device Layer

Answer: (a)

Justification: Please refer to Slide 9 of Lecture 5 of Week 4

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6. Which of the following is not a differentiator between IIoT and Automation?

a. Ubiquitous sensing
b. Advanced analytics
c. IT tools and methodologies
d. None of these

Answer: (d)

Justification: Please refer to Slide 3 of Lecture 2 of Week 4

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7. In the context of Cybersecurity for Industry 4.0, what does SDCMA stand for?

a. Secure Data and Cloud Management Architecture
b. Secure Data and Cloud Management Architecture

c. Software-Defined Cloud Manufacturing Architecture
d. Smart Digital Cloud Monitoring Algorithm

Answer: (c)

Justification: Please refer to Slide 20 of Lecture 1 of Week 4

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8. Fill in the blank. According to GE, _____ can be defined as “the association of the global industrial system with low-cost sensing, interconnectivity through internet, high-level computing and analytics

a. Industrial Internet
b. Internet of Things
c. M2M Communication
d. SCADA

Answer: (a)

Justification: Please refer to Slide 9 of Lecture 3 of Week 4

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9. What are the three key elements of the Industrial Internet?

a. Connected Devices, Ubiquitous Sensing, and Cloud Computing
b. Intelligent Machines, Advanced Analytics, and People at work
c. 5G Networks, Quantum Computing, and Virtual Reality
d. Autonomous Robots, Blockchain, and Cloud Gaming

Answer: (b)

Justification: Please refer to Slide 10 of Lecture 3 of Week 4

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10. What is Multisensing?

a. Ability to sense multiple parameters at a single sensor node
b. Using multiple sensors to measure a single parameter
c. A network of distributed sensors communicating wirelessly
d. Ability to process sensor data using artificial intelligence

Answer: (a)

Justification: Please refer to Slide 10 of Lecture 4 of Week 4

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11. Which of the following is not an advantage of WSANs?

    a. Preinstalled infrastructure
    b. Network self-organization
    c. Easy sensor & Actuator deployment
    d. Does not require any power source to operate

Answer: (d)

Justification: Please refer to Slide 27 of Lecture 4 of Week 4

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12. Which of the following is a major challenge for industrial processes in Industry 4.0?

    a. Decreasing demand for automation
    b. Unlimited availability of skilled workers
    c. Constrained workforce and resource utilization
    d. Reduced need for supply chain management

Answer: (c)

Justification: Please refer to Slide 5 of Lecture 5 of Week 4

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13. What is a key benefit of an autonomous pull economy in Industrial Process 4.0?

    a. High waste generation
    b. Complete manual supervision
    c. End-to-end automation facility
    d. Lack of updated demand information

Answer: (c)

Justification: Please refer to Slide 14 of Lecture 5 of Week 4

14. Which of the following represents the basic components of a SCADA system?

a. Programmable Logic Controllers (PLC) and Remote Terminal Units (RTU)
b. Supervisory System
c. Communication Infrastructure
d. All of the above

Answer: (d)

Justification: Please refer to Page 235-236 of the book Introduction to Industrial Internet of Things and Industry 4.0 by S Misra, C Roy, A Mukherjee by CRC Press

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15. According to IEEE 1451 standards, how is a smart sensor defined?

a. Sensor with limited memory and no communication capabilities
b. Sensor with small memory and standardized physical connection to enable communication with the processor and data network
c. A basic sensor without processing or networking capabilities
d. Sensor that only works in standalone mode without network integration

Answer: (b)

Justification: Please refer to Page 86 of the book Introduction to Industrial Internet of Things and Industry 4.0 by S Misra, C Roy, A Mukherjee by CRC Press

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