1.
What is the full form of IIoT?

    a. Industry Internet of Thing
    b. Industrial Internet of Things
    c. Integration Internet of Things
    d. Idea Internet of Things

Answer: (b)

2.
 A central hub is used in which of the following topology?

    a. Star
    b. Bus
    c. Ring
    d. Mesh

Answer: (a)

3.
What is the full form of TCP?

    a. Transmission Control Protocol
    b. Transmit Control Protocol
    c. Transform Control Protocol
    d. None of the above

Answer: (a)

4.
 Which of the following is not a layer of TCP/IP?

    a. Transport layer
    b. Network layer
    c. Application layer
    d. Internet layer

Answer: (d)

5.
Fill in the blanks. E-mail stands for _____

    a. Electronic mail
    b. Electric mail
    c. Electromagnetic mail
    d. Easy mail

Answer: (a)

6.
Fill in the blanks. The speed of Internet is represented by _____.

    a. dpi
    b. GHz
    c. Gbps
    d. GB

Answer: (c)

7.
Which of the following sensor is used for sensing humidity and temperature?

    a. BMP280
    b. DHT11
    c. Photoresistor
    d. EEG sensor

Answer: (b)

8.
What is the full form of WWW?

    a. World Wide Web
    b. Word Wide Web
    c. World Wave Web
    d. All of the above

Answer: (a)

9.

Which of the following does not represents a network topology?

    a. Truck
    b. Bus
    c. Ring
    d. Star

Answer: (a)

10.

Fill in the blanks. LAN stands for _____.

    a. Local Area Net
    b. Local Area Network
    c. Logical Array Network
    d. Local Array Network

Answer: (b)

---

1. Which of the following is/are not a type of transducer?
   a. Speaker
   b. Microphone
   c. Solar panel
   d. Connecting wire

Answer: d

Justification: Refer to Week 1, lecture 1, slide 3.

---

2. "Sensor is sensitive to only the measured property. It is insensitive to any other property besides what it is designed to detect." True or false?
   a. True
   b. False

Answer: a

Justification: Refer to pages 98-99 from the book Introduction to Internet of Things.

---

3. "_____ sensors produce an output proportional to the magnitude of the quantity being measured." Fill in the blank.
   a. Scalar
   b. Vector
   c. Analog
   d. Digital

Answer: a

Justification: Refer to pages 100-101 from the book Introduction to Internet of Things and slides 14-19 from Week 1, lecture 1.

---

4. What is the resolution of a sensor?
   a. It provides the difference between the measured value and the actual value of the sensing parameter.
   b. It provides the smallest change in the input that a sensor is capable of sensing.
   c. It provides the incremental changes produced in response by the system.
   d. All of the above.

Answer: b

Justification: Refer to slides 7-9 from lecture 1 of week 1.

5. _____ is a part of the system that deals with the control actions required in the system.
    a. Sensor
    b. Actuator
    c. Manager
    d. None of the above

Answer: b

Justification: Refer to slide 21 from lecture 1 of week 1.

---

6. What is the function of an electric rotary actuator?
    a. Converts mechanical energy into electrical energy
    b. Converts analog signals to digital signals
    c. Converts electrical energy into rotational motion
    d. All of the above

Answer: c

Justification: Refer to slide 25 from lecture 1 of week 1.

---

7. Which of the following communication standards provide a framework for WPAN ?
    a. 6LowPan
    b. IEEE 802.15.4
    c. Z- wave
    d. Wireless HART

Answer: b

Justification: Refer to slide 4 from lecture 2 of week 1.

---

8. The IEEE 802.15.4 standard uses DSSS scheme for data transmission. What does DSSS stand for?
    a. Double Spread Spectrum Scheme
    b. Direct-Sequence Spread Spectrum
    c. Discrete-Sequence Spread Spectrum
    d. Dynamic-Sequence Spread Spectrum

Answer: b

Justification: Refer to slide 5 from lecture 2 of week 1.

---

9. When does Zigbee uses the OQPSK modulation scheme?
   a. When the operating frequency is less the 2.4 GHz
   b. When the operating frequency is more than 2.4 GHz
   c. When the operating frequency is 2.4 GHz
   d. All of the above

Answer: c

Justification: Refer to slide 12 from lecture 2 of week 1.

10. Which of the following statements is true about the end devices in Zigbee protocol?
    a. End devices do not participate in data routing
    b. End device manages and controls the network
    c. End devices contribute in data relaying
    d. There can be only one end device in a Zigbee network

Answer: a

Justification: Refer to slide 14 from lecture 2 of week 1.

11. What is the maximum packet size supported by IEEE 802.15.4 standard?
    a. 1280 bytes
    b. 125 bytes
    c. 127 bytes
    d. 256 bytes

Answer: c

Justification: Refer to slide 18 from lecture 2 of week 1.

12. Z-wave uses _____ network topology. Fill in the blank.
    a. Bus
    b. Star
    c. Tree
    d. Mesh

Answer: d

Justification: Refer to slide 3 from lecture 3 of week 1.

13. Passive tags in RFID are powered by their own power source. True or False?
   a. True
   b. False

Answer: b

Justification: Refer to slide 17 from lecture 3 of week 1.

14. What is the full form of IETF in the context of the Internet?
   a. Internet Enforced Task Force
   b. Internet for Engineers Task Force
   c. Internet Engineers Task Force
   d. Internet Engineering Task Force

Answer: d

Justification: Refer to slide 5 from lecture 4 of week 1.

15. MQTT works on _____framework on top of TCP/IP. Fill in the blank.
   a. Push/Pull
   b. Publish/Subscribe
   c. Client/Server
   d. None of the above

Answer: b

Justification: Refer to slide 4 from lecture 5 of week 1.

1. Which of the following is a feature of the Fourth industrial revolution?
    a. Use of Mainframes and the Internet
    b. Mass production
    c. Utilization of machines in production processes
    d. Use of AI ML, and CPS

Answer: d

Justification: Refer to slides 3-6 from lecture 1 of week 2.

2. _____ has helped in producing objects that are mutable and adaptable. Fill in the blank.
    a. Digital fabrication
    b. Additive manufacturing
    c. Synthetic biology
    d. None of the above

Answer: a

Justification: Refer to slides 10-11 from lecture 1 of week 2.

3. Select the option that best describes the tipping point.
    a. Radical change in the future that leads to innovation
    b. Change that leads to failing economy
    c. A point which marks the profit in business
    d. A space in factory floor for goods collection

Answer: a

Justification: Refer to slides 22 from lecture 1 of week 2.

4. Which of the following is/are drivers of sustainability in Industry 4.0?
    a. Globalization
    b. Socio-economic factors
    c. Environmental factors
    d. All of the above

Answer: d

Justification: Refer to pages 58-62 from the book Introduction to Industrial Internet of Things and Industry 4.0.

5. Information regulation in public is covered under which of the following laws?
    a. Employment and Labor rules
    b. Advertisement regulations
    c. Environmental rules
    d. Privacy regulation

Answer: b

Justification: Refer to slides 14-18 from lecture 2 of week 2.

---

6. How does population growth affect the manufacturing industry?
    a. It affects the food supplies
    b. It affects the availability of industrial locations
    c. It affects the political actions and outcomes
    d. All of the above

Answer: d

Justification: Refer to slides 19 from lecture2 of week 2.

---

7. Which of the following statements is true about recession?
    a. Recession is the extremity of depression
    b. Recession stays for only two months
    c. Recession is observable on GDP of a country
    d. All of the above

Answer: c

Justification: Refer to slides 24-25 from lecture 2 of week 2.

---

8. The lean manufacturing system, introduced by Toyoto, is based on which of the following approaches?
    a. JIDOKA
    b. JIT
    c. Both a and b
    d. SUDOKA

Answer: c

Justification: Refer to pages 171-173 from the book Introduction to Industrial Internet of Things and Industry 4.0.

9. Which of the following is not an impact of the Lean production system on manufacturing?
    a. Highest lead time
    b. Low cost
    c. High quality
    d. All of the above

Answer: a

Justification: Refer to slides 9-11 from lecture 3 of week 2.

10. What is KPI in the context of performance management?
    a. Key Product Index
    b. Key Performance Indicator
    c. Key Performance Index
    d. Key Product Identifier

Answer: b

Justification: Refer to slides 12-13 from lecture 3 of week 2.

11. Which of the following statements is/are true about smart and connected products?
    a. Smart and connected products are cheaper
    b. Decrease environmental impact
    c. Improves recall process of products
    d. All of the above

Answer: d

Justification: Refer to slides 3-4 from lecture 4 of week 2.

12. Lock-in centric business models helps in
    a. Preventing customer migration
    b. Eliminating errors
    c. Making faster transactions
    d. Creating new market for innovative product

Answer: a

Justification: Refer to slides 13-16 from lecture 4 of week 2.

13. What is the function of the digital layer in a smart business architecture?
    a. Data storage
    b. Data analysis
    c. Data processing
    d. All of the above

Answer: d

Justification: Refer to slides 22 from lecture 4 of week 2.

14. Which of the following is not a characteristic of a smart factory?
    a. Proactivity
    b. Agility
    c. Opaque
    d. Optimization

Answer: c

Justification: Refer to slides 11 from lecture 5 of week 2.

15. Which of the following falls under the Agility characteristic of a smart factory?
    a. Predicting future challenges
    b. Real-time tracking
    c. Connected smart devices
    d. Self-configuration

Answer: d

Justification: Refer to slides 11-16 from lecture 5 of week 2.

1. What is the full form of CPS?
   a. Central-Physical System
   b. Cyber-Physical System
   c. Cyber-Property System
   d. Central-Private System

Answer: b

Justification: Refer to slides 1-5 of lecture 1, week 3.

2. Select the statement(s) that best describes a CPS.
   a. A CPS interacts with the physical world through sensors and actuators.
   b. A CPS is a network of physical and computational components.
   c. It is a set of multiple networked embedded systems.
   d. All of the above

Answer: d

Justification: Refer to slides 3-5 of lecture 1, week 3.

3. What does conversion refer to in context of CPS architecture for IIoT?
   a. Conversion of CPS into individual components.
   b. Conversion of machine data to meaningful information.
   c. Conversion of present data into future data prediction.
   d. Conversion of analog signal to digital signal.

Answer: b

Justification: Refer to slides 14-15 of lecture 1, week 3.

4. Select the statement which describes one of the limitations of smart sensors.
   a. Sensor data aggregation not possible.
   b. Cannot connect with an actuator.
   c. Cannot connect to a network
   d. All of the above

Answer: a

Justification: Refer to slides 21-23, lecture 1, week 3.

5. _____sensors are capable of processing sensed data and performing pre-defined functions by processing data. Fill in the blank with the appropriate option.
   a. Smart
   b. Intelligent
   c. Digital
   d. Scalar

Answer: b

Justification: Refer to slide 23, lecture 2, week 3.

6. Which of the following allows application-specific customization of sensor nodes?
    a. Smart sensors
    b. Intelligent sensors
    c. ADC
    d. None of the above

Answer: b

Justification: Refer to slides 24-26, lecture 1, week 3.

7. _____ allows employees to share information and solve business problems. Fill in the blank.
    a. Sharing platform
    b. Business platform
    c. E-Commerce platform
    d. Collaboration platform

Answer: d

Justification: Refer to slide 2, lecture 2, week 3

8. Coordination is one of the four keys that enable collaboration productivity. How can one initiate coordination?
    a. Provide authority to decision-makers in a decentralized system.
    b. Format data model to store every data element exactly once.
    c. Bridge the gap between the virtual and physical world.
    d. All of the above

Answer: a

Justification: Refer to slides 5-8, lecture 2, week 3

9. How many components are there in PLM that are used to handle a product across its lifetime?
    a. 3
    b. 5
    c. 7
    d. 9

Answer: d

Justification: Refer to slide 17, lecture 2, week 3

10. Which of the following statements is true about Augmented reality?
    a. It is a mixture of interactive hardware and software-based artificial environment.
    b. It creates and enhances an imaginary reality.
    c. It amplifies the present perception of reality.
    d. All of the above

Answer: c

Justification: Refer to slides 4-15, lecture 3, week 3

11. What is projection-based AR?
    a. It gives outcomes by projecting light on real world surfaces.
    b. It substitutes the original view with of an object with the augmented view.
    c. It gives the output when a marker is detected.
    d. It is used for GPS-denied regions

Answer: a

Justification: Refer to slides 9-12, lecture 3, week 3

12. Semi-immersive simulation is a type of
    a. AR
    b. VR
    c. Both a and b
    d. None of the above

Answer: b

Justification: Refer to slide 9, lecture 3, week 3

13. Which of the following search methods is used by a computer program that does not use artificial intelligence?
    a. Heuristic
    b. Algorithmic
    c. Approximation
    d. None of the above

Answer: b

Justification: Refer to slide 5, lecture 4, week 3

14. Select the correct statement.
    a. Artificial intelligence is a type of machine learning
    b. Deep learning is a subset of machine learning
    c. Deep learning cannot learn the features on its own.
    d. Machine learning is a subset of deep learning.

Answer: b

Justification: Refer to slides 8-10, lecture 5, week 3

15. Which of the following statements is true about the GFS file system?
    a. It is based on the Hadoop Distributed File System
    b. It is a distributed file system that supports large-scale file system
    c. It is a centralized file management system
    d. It is a file system designed specifically for unstructured data management

Answer: b

Justification: Refer to slide 18, lecture 5, week 3

1. Cybersecurity involves the security of
    a. Hardware and software
    b. Software and data
    c. Hardware, software, and data
    d. Hardware, software, data and processes

Answer: c

Justification: Refer to slide 3, lecture 1, week 4

2. _____ security represents the set of policies that monitor and prevent unauthorized access, safeguard the data and network from network traffic. Fill in the blank.
    a. Information
    b. Hardware
    c. Software
    d. Network

Answer: d

Justification: Refer to the book Introduction to Industrial Internet of Things and Industry 4.0, page 66.

3. Locky is an example of which type of cybersecurity threat?
    a. Ransomware
    b. Malware
    c. Phishing
    d. All of the above

Answer: a

Justification: Refer to slides 11-12, lecture 1, week 4

4. What does C represent in the CIA-Triad in cybersecurity?
    a. Cyber-physical
    b. Centralized
    c. Confidentiality
    d. Critical

Answer: c

Justification: Refer to slides 15-16, lecture 1, week 4

5. What is ubiquitous sensing in IIoT?
    a. In IIoT, sensors and actuators are used to control critical elements.
    b. In IIoT, sensors and actuators are used almost everywhere to control, enhance and optimize various functions.
    c. In IIoT, advanced analytics helps to enhance the working condition, increase machine life and optimize operational efficiency.
    d. None of the above

Answer: b

Justification: Refer to slides 5-6, lecture 2, week 4

6. Which of the following is a data integration challenge in deploying IIoT?
    a. Understanding the generated data for analysis and application in business.
    b. Storing the data
    c. Lack of skills
    d. Cybersecurity

Answer: a

Justification: Refer to slides 8-10, lecture 2, week 4

7. Commercialization and the mass production of steam engines marked the beginning of the_____ stage of the Industrial revolution. Fill in the blank.
    a. Fourth
    b. Third
    c. Second
    d. First

Answer: d

Justification: Refer to slide 5, lecture 3, week 4

8. What were the negative effects of Industrial revolution?
    a. Harm to environment by waste products
    b. Inefficient
    c. Bad working environment
    d. All of the above

Answer: d

Justification: Refer to slide 7, lecture 3, week 4

9. How many key elements are there in the Industrial internet?
    a. 4
    b. 3
    c. 5
    d. 2

Answer: b

Justification: Refer to slide 10, lecture 3, week 4

10. How does sensing contributes to the industry?
    a. Increase downtime
    b. Increase cost
    c. Higher degree of automation
    d. Safety hazards

Answer: c

Justification: Refer to slide 3, lecture 4, week 4

11. A smart sensor can perform multiple sensing, unlike the traditional sensors. True or false?
    a. True
    b. False

Answer: a

Justification: Refer to slide 10, lecture 4, week 4

12. What is self-decision making in a smart sensor?
    a. It can self-monitor its operation and changes in the ambience by taking proper decision by itself.
    b. Reduce the cost by reduced downtime
    c. Communicate data
    d. Enable multiple parameter sensing

Answer: a

Justification: Refer to slide 11, lecture 4, week 4

13. What is the full form of SCADA?
    a. Supervisory Confidential and Data Acquisition
    b. Supervisory Control and Data Acquisition
    c. Smart Control and Data Acquisition
    d. Smart Controlled and Direct Acquisition

Answer: b

Justification: Refer to slide 24, lecture 4, week 4

14. What does the Cognitive layer in the 5C architecture for Cyber-physical Systems represents?
    a. System for supervised control: Self-configure, Self-Optimize, Self-Adjust
    b. Sensor records machine health data: data to information interpretation
    c. System for optimized decision: Human-readable interpretation & data visualization
    d. All of the above

Answer: c

Justification: Refer to slide 9, lecture 5, week 4

15. How can smart factory be beneficial in inventory tracking?
    a. Global inter-connectivity of smart factory facilitates real-time updates of inventory
    b. Ease of process re-adjustment facility
    c. End-to-end production line management with sensors
    d. None of the above

Answer: a

Justification: Refer to slide 17, lecture 5, week 4

1. Which of the following is a feature of Amazon Smart Warehousing's logistics and supply chain management?

        (a) Manual control of supply fleet
        (b) Logistic status update with future market demand
        (b) Centralized customer service
        (c) Distributed parking and space surrounding control

Answer: (b)

Justification: Refer to slide 5 of lecture 1 from week 5

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2. How does Boeing achieve efficient manufacturing?

        (a) Using smart & digital manufacturing facility
        (b) By lowering assembly delay & response time
        (c) By reducing errors in manufacture & assembly
        (d) All the above

Answer: (d)

Justification: Refer to slides 6 of lecture 1 from week 5

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3. Which of the following company provides Air-as-a-Service?

      (a) Kaeser Kompressoren
      (b) Hitachi
      (c) John Deere
      (d) Komatsu

Answer: (a)

Justification: Refer to slide 10 of lecture 1 from week 5

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4. According to the International Labor Organization, what is the approximate death rate owing to occupational disease or accident?

        (a) ~1/5 seconds

(b) ~1/10 seconds
(c) ~1/15 seconds
(d) ~1/20 seconds

Answer: (c)

Justification: Refer to slides 16 of lecture 1 from week 5

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5. What is a Business Model?

(a) A business model describes the rationale of how an organization creates, delivers, and captures value.
(b) It is the embodiment of the organizational and financial architecture of a business.
(c) It is the description of how a business intends to operate and earn profits in a specific marketplace.
(d) All of the above

Answer: (d)

Justification: Refer to slides 2 of lecture 2 from week 5

---

6. What is a Market Segment?

(a) It is the different groups of customers or end-user organizations that the business enterprise aims to serve.
(b) It is the key resources and activities that a business requires to create value proposition.
(c) It is the products or services that create value for the customer segment.
(d) All of the above

Answer: (a)

Justification: Refer to slides 4-6 of lecture 2 from week 5

---

7. Which of the following statement is true w.r.t. Subscription Model?

(a) It can be used for Smart Energy
(b) It brings together the businesses and their customers to monetize the solutions

(c) It aims to minimize downtime and maximize utilization of the assets
(d) It is capable of generating "recurring" revenue

Answer: (d)

Justification: Refer to slide 13 of lecture 2 from week 5

---

8. Which of the following is not an IIoT business models?

      (a) Cloud-based Business Model
      (b) Service-Oriented Business Model
      (c) Outcome-based Business Model
      (d) Process-Oriented Business Model

Answer: (c)

Justification: Refer to slides 4 of lecture 3 from week 5

---

9. Which of the following Cloud-Based Business Model aims to provide the required hardware and software online in the cloud?

      (a) Infrastructure-as-a-Service
      (b) Platform-as-a-Service
      (c) Software-as-a-Service
      (d) All of the above

Answer: (a)

Justification: Refer to slide 6 of lecture 3 from week 5

---

10. Which of the following is a/are challenge(s) of IIoT Business Model?

      (a) Lack of interoperability
      (b) Immature or untested technologies

(c) Increase complexity
(d) All of the above

Answer: (d)

Justification: Refer to slide 25-27 of lecture 3 from week 5

---

11. What is the full form of IIRA?

(a) Industrial Internet Related Architecture
(b) Industrial Internet Regional Architecture
(c) Industrial Internet Reference Architecture
(d) Industrial Internet Real-time Architecture

Answer: (c)

Justification: Refer to slide 2 of lecture 4 from week 5

---

12. "Industrial Internet Consortium (IIC) is a non-profit organization created to promote open standards and interoperability for industry technologies and machine-to-machine (M2M) environments." – Is the statement True or False?

(a) True
(b) False

Answer: (a)

Justification: Refer to slide 7 of lecture 4 from week 5

---

13. Which of the following are the components of Gateway-Mediated Edge Architecture?

(a) Edge layer, Platform layer, Enterprise layer
(b) Physical layer, Edge devices/Gateway, Cloud
(c) Sensors and Actuators, Edge devices/Gateway, Wide Area Network
(d) Smart Machines, System of Systems, Industrial Internet

Answer: (c)

Justification: Refer to slides 17 of lecture 4 from week 5, or page 115-116 of the book,"
Introduction to Industrial Internet of Things and Industry 4.0".

---

14. Which of the following is not a viewpoint of IIRA?

      (a) Business viewpoint
      (b) Market viewpoint
      (c) Functional viewpoint
      (d) Usage viewpoint

Answer: (b)

Justification: Refer to slide 2 of lecture 5 from week 5

---

15. How many domains are there in the Functional Viewpoint of IIRA?

      (a) 4
      (b) 5
      (c) 6
      (d) 7

Answer: (c)

Justification: Refer to slide 14 of lecture 5 from week 5

---

1. Which type of voltage does LM 35 temperature sensor generate?

   a. Analog
   b. Digital
   c. Both analog and digital
   d. It is unable to generate any voltage

Answer: (a)

Justification: Please refer to Slide 15 of Lecture 1 of Week 6

---

2. Temperature sensor DS1621 is a _____ sensor, which generates _____ bits temperature data.

   a. analog, 5
   b. analog, 9
   c. digital, 5
   d. digital, 9

Answer: (d)

Justification: Please refer to Slide 16 of Lecture 1 of Week 6

---

3. Which of the following is the application of Ultrasonic sensor?

   a. Detects radiations coming from human body in its surrounding area
   b. Distance measurement, pattern matching, color checking, structured lighting, and motion capture
   c. Automatic door open/close, human detection, lift lobby, common staircase, and shopping Mall
   d. Liquid level monitoring of tank, trash level monitoring

Answer: (d)

Justification: Please refer to Slide 25 of Lecture 1 of Week 6

4. What is the Baseline Resistance of a sensor?

    a. Resistance of the sensor material in air when not exposed to the target gas
    b. Resistance of the sensor material in air when exposed to the target gas
    c. Resistance of the sensor material when not exposed to the atmosphere
    d. Resistance of the sensor material when exposed to the atmosphere

Answer: (a)

Justification: Please refer to Slide 4 of Lecture 2 of Week 6

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5. Which type of sensor decreases its resistance w.r.t. the baseline resistance when exposed to a reducing gas?

    a. c-type sensors
    b. p-type sensors
    c. n-type sensors
    d. All the sensor types

Answer: (c)

Justification: Please refer to Slide 5 of Lecture 2 of Week 6

---

6. Define the Sensitivity of a gas sensor.

    a. It is the ability to detect a particular gas in a mixture of different gases.
    b. It is the change in the output signal with respect to unit change in input.
    c. It is characteristic of the sensor which ensures its resistance to return to its base resistance value if exposure to the target gas is stopped.
    d. None of the above

Answer: (b)

Justification: Please refer to Slide 6, 7 of Lecture 2 of Week 6

---

7. Which of the following protocol falls under the category of Industrial Ethernet??

    a. CC-Link
    b. DeviceNet
    c. Time-Sensitive Networking (TSN)
    d. Interbus

Answer: (c)

Justification: Please refer to Slide 3 of Lecture 3 of Week 6

---

8. What are the two units defined in the ModBus-TCP data frame?

    a. Protocol Data Unit and Application Data Unit
    b. Protocol Data Unit and Communication Data Unit
    c. Communication Data Unit and Application Data Unit
    d. None of the above

Answer: (a)

Justification: Please refer to Slide 6 of Lecture 3 of Week 6

---

9. Which of the following network topology/(ies) is/are not supported by EtherCat?
    a. tree
    b. hybrid
    c. star
    d. mesh
Answer: (d)

Justification: Please refer to Slide 11 of Lecture 3 of Week 6

---

10. What is the maximum data rate per packet of EtherNet/IP?

    a. 500 bytes
    b. 100 bytes
    c. 1500 bytes
    d. 2000 bytes

Answer: (c)

Justification: Please refer to Slide 15 of Lecture 3 of Week 6

---

11. What is the full form of Profinet?

    a. PReplanned FIeld NETwork

b. PROcess Figured NETwork
c. PReplanned Figured NETwork
d. PROcess FIeld NETwork

Answer: (d)

Justification: Please refer to Slide 17 of Lecture 3 of Week 6

---

12. Which of the following communication infrastructure is an example of wired connectivity?

a. LPWAN
b. PSTN
c. IEC-PAS 62601/WIA-PA
d. ISA 100

Answer: (b)

Justification: Please refer to Slide 16 of Lecture 4 of Week 6

---

13. Which of the following is/are the limitation(s) of satellite communication?

a. Launching of satellite in space comes at a higher cost
b. Propagation delay is more compared to other terrestrial methods
c. Difficulty in repairs in case of any damage
d. All of the above

Answer: (d)

Justification: Please refer to Slides 28 of Lecture 4 of Week 6

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14. What is the frequency spectrum of mmWave for cellular communication?

a. 30 – 100 GHz
b. 30 – 100 MHz
c. 57 – 64 GHz
d. 57 – 64 MHz

Answer: (a)

Justification: Please refer to Slide 26 of Lecture 5 of Week 6

15. The output voltage of LM 35 temperature sensor is _____ proportional to the Celsius temperature.

   a. quadratically
   b. exponential
   c. linearly
   d. None of the above

Answer: (c)

Justification: Please refer to Slide 15 of Lecture 1 of Week 6

1. What is the payload per message of SIGFOX?

    a. 10 bytes
    b. 11 bytes
    c. 12 bytes
    d. 13 bytes

Answer: (c)

Justification: Please refer to Slide 5 of Lecture 1 of Week 7

---

2. Which of the following is a processor?

    a. DHT
    b. LoRa
    c. NodeMCU
    d. None of the above

Answer: (c)

Justification: Please refer to Slide 7 of Lecture 1 of Week 7

---

3. "We can use Arduino IDE to program a NodeMCU board." --- Is this statement True/False?

    a. True
    b. False

Answer: (a)

Justification: Please refer to Slide 15-20 of Lecture 1 of Week 7

---

4. Which of the following topology(ies) is/are supported by ZigBee?

    a. Star
    b. Tree
    c. Mesh
    d. All of the above

Answer: (d)

Justification: Please refer to Slide 5 of Lecture 2 of Week 7

---

5. Which software is used to configure XBee?

   a. XCTU
   b. Arduino IDE
   c. NodeMCU
   d. DHT

Answer: (a)

Justification: Please refer to Slide 8 of Lecture 2 of Week 7

---

6. Which Python library is necessary/imported while using Xbee?

   a. numpy
   b. TensorFlow
   c. DigiMesh
   d. OpenCV

Answer: (c)

Justification: Please refer to Slide 11, 12 of Lecture 2 of Week 7

---

7. Which of the following statements is true about Complex Event Processing (CEP)?

   a. It analyses and correlates event stream from different data sources
   b. Can process data in near real-time
   c. Extract causal and temporal patterns using predefined rules
   d. All of the above

Answer: (d)

Justification: Please refer to Slide 4, 5 of Lecture 3 of Week 7

---

8. Edge provides _____ computing, and cloud provides _____ computing.

   a. distributed, decentralized
   b. centralized , distributed

c. distributed, centralized
d. decentralized , distributed

Answer: (c)

Justification: Please refer to Slide 6 of Lecture 3 of Week 7

---

9. What are the Enablers of Prescriptive analytics in the context of IIoT - Processing & Analytics?

a. Optimization/Simulation/Decision models
b. Data mining/Web mining/predictions
c. Dashboard/Reports/Scorecards
d. All of the above

Answer: (a)

Justification: Please refer to Slide 9 of Lecture 3 of Week 7, or page 244 of the book," Introduction to Industrial Internet of Things and Industry 4.0".

---

10. What are the component of FarmBeats?

a. Soil sensors, camera, UAVs, weather station, IoT gateway, IoT base station, cloud-services
b. Farmers, Brokers, customers, transport, markets
c. Sensors, weather station, gateway, base station, cloud
d. Sensors, virtual entity, analytics & learning, data management, service management

Answer: (a)

Justification: Please refer to Slide 2 of Lecture 4 of Week 7

---

11. What is SWAMP?

a. Water management system
b. Data-driven precision agriculture
c. Irrigation management for different types of crops & climate in different countries
d. Analytics to empower understanding of plant growth according to soil and climatic conditions

Answer: (c)

Justification: Please refer to Slides 4 of Lecture 4 of Week 7

---

12. Which of the following provides Cognitive Manufacturing?

a. SmartSantander
b. iRobot-Factory
c. FarmBeats
d. None of the above

Answer: (b)

Justification: Please refer to Slide 14 of Lecture 4 of Week 7

---

13. What are the three different phases of smart manufacturing?

a. Organize & process data, decision making, and Generating & controlling the events in real-time
b. Collection of the service offerings & infrastructure, virtualization, allocation & management of services, and on-demand service provisioning
c. Authentication, Authorization and Accounting (AAA), Test bed management, and Application
d. Integration of data and contextual information, synthesis & analysis, innovation in process & production

Answer: (d)

Justification: Please refer to Slide 17 of Lecture 4 of Week 7

---

14. What is the three user entities in Industrial Manufacturing?

a. Providers, manufacturers, operators
b. Providers, consumers, operators
c. Providers, manufacturers, distributers
d. Providers, consumers, distributers

Answer: (b)

Justification: Please refer to Slide 21 of Lecture 4 of Week 7

---

15. How many major components comprise Industrial Control Systems?

a. 4
b. 5
c. 6
d. 7

Answer: (a)

Justification: Please refer to Slides 2 of Lecture 5 of Week 7

---

1. What are the three types of IIoT Analytics?

  a. Systematic Analytics, Predictive Analytics, Prescriptive Analytics
  b. Descriptive Analytics, Systematic Analytics, Prescriptive Analytics
  c. Descriptive Analytics, Predictive Analytics, Systematic Analytics
  d. Descriptive Analytics, Predictive Analytics, Prescriptive Analytics

Answer: (d)

Justification: Please refer to Slide 5 of Lecture 1 of Week 8

---

2. What are the main 5 Vs of big data?

  a. Volume, virtualization, viscosity, veracity, variety
  b. Volume, virtualization, variability, viscosity, variety
  c. Volume, velocity, virtualization, veracity, viscosity
  d. Volume, velocity, variability, veracity, variety

Answer: (d)

Justification: Please refer to Slide 7 of Lecture 1 of Week 8

---

3. "Machine learning is a subset of deep learning." --- True/False?

  a. True
  b. False

Answer: (b)

Justification: Please refer to Figure 13.1, page 256 of the book," Introduction to Industrial Internet of Things and Industry 4.0".

---

4. Which of the following is an example of Classification?

  a. Bayes Regression
  b. Support Vector Machine
  c. Gaussian Mixture Model
  d. All of the above

Answer: (b)

Justification: Please refer to Slide 14 of Lecture 1 of Week 8

---

5. Clustering is used in _____ learning?

    a. Unsupervised
    b. Supervised
    c. Reinforcement
    d. None of the above

Answer: (a)

Justification: Please refer to Slide 8 of Lecture 2 of Week 8

---

6. Which machine learning algorithm enables machines to improve performance by automatically learning the ideal behaviors for a specific environment??

    a. Unsupervised Learning
    b. Supervised Learning
    c. Reinforcement Learning
    d. Deep Learning

Answer: (c)

Justification: Please refer to Slide 13 of Lecture 2 of Week 8

---

7. Which node in the Decision Tree evaluates or determines the outcome based on an attribute's value?

    a. Parent node
    b. Leaf node
    c. Decision node
    d. Root node

Answer: (c)

Justification: Please refer to Slide 12 of Lecture 2 of Week 8

---

8. What is the subfield of machine learning that mimics the working function of billions of neurons in our brain??

    a. Regression
    b. Deep Learning
    c. Decision tree
    d. Reinforcement learning

Answer: (b)

Justification: Please refer to Slide 6 of Lecture 3 of Week 8

---

9. Why do we need cloud?

    a. For high computational speed for data monitoring and analytics
    b. For storage of huge amount of data
    c. For effective data acquisition
    d. All of the above

Answer: (d)

Justification: Please refer to Slide 5 of Lecture 4 of Week 8

---

10. What are the three types of services offered by cloud computing?

    a. SeaaS, PaaS and IaaS
    b. SeaaS, CaaS and IaaS
    c. SaaS, PaaS and IaaS
    d. NaaS, CaaS and IaaS

Answer: (c)

Justification: Please refer to Slides 8 of Lecture 4 of Week 8

11. Which of the following is an example of Infrastructure-as-a-Service?

    a. Google App Engine
    b. Microsoft Azure
    c. Microsoft 365
    d. All of the above

Answer: (b)

Justification: Please refer to Slide 10 of Lecture 4 of Week 8

---

12. Amazon Web Service is a _____ cloud.

    a. public
    b. private
    c. hybrid
    d. community

Answer: (a)

Justification: Please refer to Slide 11 of Lecture 3 of Week 8

---

13. Which one of the following is not a characteristic of a good SLA?

    a. Mutually Acceptable
    b. Quantifiable
    c. Refundable
    d. Controllable

Answer: (c)

Justification: Please refer to Slides 13 of Lecture 5 of Week 8

---

14. Fog layer is located between which two layers?

    a. the edge and the gateways
    b. the devices and the edge
    c. the devices and the gateways
    d. the edge and the cloud

Answer: (d)

Justification: Please refer to Slide 22 of Lecture 5 of Week 8

---

15. What are the three main layers of Deep learning?

    a. Input layer, prediction layer, output layer
    b. Input layer, hidden layer, decision layer
    c. Input layer, prediction layer, decision layer
    d. Input layer, hidden layer, output layer

Answer: (d)

Justification: Please refer to Slide 8 of Lecture 3 of Week 8

1. Why is it necessary to have fog computing in IIoT?

    a. To enable new functionalities
    b. To enrich the current functionalities available
    c. To process control analytics
    d. All of the above

Answer: (d)

Justification: Please refer to Slide 3 of Lecture 1 of Week 9

---

2. What is the sub-application area of fog computing in smart road transportation systems?

    a. Smart traffic signal system
    b. Healthcare
    c. Mining industry
    d. None of the above

Answer: (a)

Justification: Please refer to the book: Introduction to Internet of Things, chapter no.- 11, Page no.- 266

---

3. State true or false — Smart parking, smart traffic light systems, location-aware services, and the Internet of Vehicles are the possible use cases of the fog-based solutions for transportation.

    a. True
    b. False

Answer: (a)

Justification: Please refer to Slide 12 of Lecture 1 of Week 9

---

4. Which of the following provide/s the fog platform?

    a. Nebbiolo Technologies
    b. Crosser
    c. FogHorn
    d. All of the above

Answer: (d)

Justification: Please refer to Slide 18 of Lecture 1 of Week 9

---

5. Which of the following represents reserve word(s) in R programming?

    a. LOOPING
    b. TRUE
    c. BREAK-IN
    d. CONTINUING

Answer: (b)

Justification: Please refer to Slide 5 of Lecture 2 of Week 9

---

6. Which of the following cannot be performed by R programming?

    a. Assembly code generation
    b. Data visualization
    c. Graphics representation
    d. Data Analysis

Answer: (a)

Justification: Please refer to Slide 3 of Lecture 2 of Week 9

---

7. Which of the following way/s can be used for the declaration of variables in R programming?

    a. A:=10
    b. B<->"Hi"
    c. TRUE->C
    d. 10<-D

Answer: (c)

Justification: Please refer to Slide 6 of Lecture 2 of Week 9

---

8. Fill in the blanks. _____ operator can be used to calculate the remainder of the division in R programming.

a. /
b. \
c. %%
d. !

Answer: (c)

Justification: Please refer to Slide 7 of Lecture 2 of Week 9

---

9. State true or false — '&' is a special operator that can create a series of numbers for a vector in R programming.

a. True
b. False

Answer: (b)

Justification: Please refer to Slide 11 of Lecture 2 of Week 9

---

10. Which of the following represents the correct order for the process of Data management?

a. Acquisition -> Generation -> Storage -> Analysis
b. Generation -> Acquisition -> Storage -> Analysis
c. Acquisition -> Storage -> Generation -> Analysis
d. Generation -> Analysis -> Storage -> Acquisition

Answer: (b)

Justification: Please refer to Slide 6 of Lecture 3 of Week 9

---

11. Fill in the blanks. _____ is used to find the spatial relationship between the objects and to analyze the geographic relation among them.

a. Streaming analytics
b. Time-series analytics
c. Spatial analytics
d. Descriptive analytics

Answer: (c)

---

12. Which of the following represents the properties of data center networks?

    a. Inconsistent
    b. Unreliable
    c. Secure
    d. Unscalable

Answer: (c)

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

---

13. Which of the following represents the topology used by the data center network?

    a. Eight-tier DCN
    b. Jcell
    c. Dcell
    d. QCube

Answer: (c)

Justification: Please refer to Slide 7 of Lecture 4 of Week 9

---

14. What are the challenges of a data center network?

    a. Scalability
    b. Static resource assignment
    c. Fault-tolerance
    d. All of the above

Answer: (d)

Justification: Please refer to Slide 14 of Lecture 4 of Week 9

---

15. State true or false —Software-Defined Network (SDN) never use OpenFlow protocol.

    a. True
    b. False

Answer: (b)

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

1. Which of the following is/are available within the public network in an SDIIoT architecture?

    a. Switches
    b. Routers
    c. Both (a) and (b)
    d. None of the above

Answer: (c)

Justification: Please refer to Slide 4 of Lecture 1 of Week 10

---

2. State true or false — In SDIIoT architecture, the industrial cloud focuses on the data center network.

    a. True
    b. False

Answer: (a)

Justification: Please refer to Slide 5 of Lecture 1 of Week 10

---

3. Which of the following is addressed by a trustworthy IIoT?

    a. Security
    b. Safety
    c. Resilience
    d. All of the above

Answer: (d)

Justification: Please refer to Slide 4 of Lecture 2 of Week 10

---

4. Fill in the blanks. The application layer of IIoT attack vectors includes _____.

    a. Traffic Flooding
    b. Misrouting
    c. Data spoofing
    d. Packet sniffing

Answer: (c)

Justification: Please refer to Slide 12 of Lecture 2 of Week 10

---

5. Which of the following is not a part of IIoT attack vectors in the physical layer?

    a. Impersonation attack
    b. Man-in-the-middle attack
    c. Jamming attack
    d. Device tampering

Answer: (b)

Justification: Please refer to Slide 14 of Lecture 2 of Week 10

---

6. Which of the following risk(s) is/are involved in IIoT security risk management?

    a. Avoiding risk
    b. Mitigating risk
    c. Outsourcing risk
    d. All of the above

Answer: (d)

Justification: Please refer to Slide 8 of Lecture 2 of Week 10

---

7. State true or false — The data protection of IIoT security does not address confidentiality.

    a. True
    b. False

Answer: (b)

Justification: Please refer to Slide 12 of Lecture 3 of Week 10

---

8. The building blocks of IIoT security include which of the following?

    a. Cloud Security
    b. Fog device protections
    c. Data Protection

d. All of the above

Answer: (d)

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

---

9. Fill in the blanks. Security standards for IIoT should include requirements of _____ and
_____.
   a. International technology, Optional technology
   b. Information technology, Operational technology
   c. Intense technology, Operative technology
   d. None of the above

Answer: (b)

Justification: Please refer to Slide 20 of Lecture 3 of Week 10

---

10. Which of the following represents the benefits of a smart factory?

   a. Unavailability of the real-time data
   b. Unbalanced workload
   c. Provisioning data analysis and quality control
   d. Extended production time

Answer: (c)

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

---

11. Match the following.

Features of Smart Factory	Description
1. Connected	i. Minimum manual intervention
2. Transparent	ii. Continuous real-time data
3. Agile	iii. Live metrics for quick decision
4. Optimized	iv. Flexibility and adaptability

   a. 1-i, 2-ii, 3-iii, 4-iv
   b. 1-ii, 2-iii, 3-iv, 4-i
   c. 1-iii, 2-iv, 3-i, 4-ii
   d. 1-iv, 2-i, 3-ii, 4-iii

Answer: (b)

Justification: Please refer to Slide 5 of Lecture 4 of Week 10

---

12. Which of the following is false about Fanuc – Zero Downtime System?

    a. Is a robot maker
    b. Uses predictive maintenance for reducing downtime
    c. Does not predict component failure
    d. Performs cloud-based analytics with the help of in-built sensors

Answer: (c)

Justification: Please refer to Slide 15 of Lecture 4 of Week 10

---

13. State true or false. CityCrop renders intelligent indoor gardens for growing fruits, herbs, vegetables, greens, and edible flowers.

    a. True
    b. False

Answer: (a)

Justification: Please refer to Slide 16 of Lecture 5 of Week 10

---

14. Which of the following does not represent the characteristics of a smart factory?

    a. Connected environment
    b. Improper utilization of resources
    c. Dynamic decision making
    d. Transparency of process status

Answer: (b)

Justification: Please refer to the book: Introduction to Industry 4.0 and Industrial Internet of Things, chapter no.-7, page no.-169

---

15. State true or false - As different persons and devices are associated with healthcare IoT systems, the risk of data tampering is high.

    a. True
    b. False

Answer: (a)

Justification: Please refer to the book: Introduction to Internet of Things, chapter no.-14, page no.-300

1. Which of the following is/are the major challenge(s) associated with the healthcare industry?

    a. Drug overdose
    b. Wrong drug prescription
    c. Costly hospitals and clinics
    d. All of the above

Answer: (d)

Justification: Please refer to the book: Introduction to Industry 4.0 and Industrial Internet of Things, Chapter- 14, page no.- 280

---

2. Fill in the blanks. _____ is an example of a wireless ECG monitoring device.

    a. QardioCore
    b. BMP280
    c. ESP8266
    d. BME280

Answer: (a)

Justification: Please refer to Slide 9 of Lecture 1 of Week 11

---

3. Which of the following is a body temperature monitoring device?

    a. Ihealth BP5
    b. Kinsa smart thermometer
    c. Dexcom
    d. ADAMM

Answer: (b)

Justification: Please refer to Slide 12 of Lecture 1 of Week 11

---

4. Which of the following represents an intelligent asthma monitoring device?

    a. BME280
    b. Kinsa smart thermometer
    c. ADAMM
    d. Dexcom

Answer: (c)

Justification: Please refer to Slide 15 of Lecture 1 of Week 11

---

5. Which of the following does not represents the challenge of IIoT in a power plant?

  a. Security issues
  b. Scalability issues
  c. Smart metering
  d. Low power devices

Answer: (c)

Justification: Please refer to Slide 11,18 of Lecture 2 of Week 11

---

6. Fill in the blanks. _____ is the full form of SCDA.

  a. Supervisory Control and Data Acquisition
  b. Superlative Control and Data Acquitance
  c. Supervisory Condition and Data Acceptance
  d. None of the above

Answer: (a)

Justification: Please refer to Slide 12 of Lecture 2 of Week 11

---

7. Which of the following does not represents communication networks?

  a. Home area network
  b. House area network
  c. Wide area network
  d. Neighborhood area network

Answer: (b)

Justification: Please refer to Slide 7 of Lecture 2 of Week 11

---

8. State true or false — RFID tagging system comprises of RFID tag, read/write devices, and a host system.

a. True
b. False

Answer: (a)

Justification: Please refer to Slide 9 of Lecture 3 of Week 11

---

9. Which of the following is true about passive RFID tags?
   a. Broadcasts information signals in the form of a beacons
   b. Relies on backscattering
   c. Have longer range than active RFID tags
   d. Bulky and expensive as compared to active RFID

Answer: (b)

Justification: Please refer to Slide 10,11 of Lecture 3 of Week 11

---

10. Which of the following is represented through the following statement?
Statement- It has an onboard battery for powering the IC but does not have an active transmitter. It relies on backscattering. However, it neither depends on signals from the reader for power nor creates additional noise.

   a. Active RFID tags
   b. Passive RFID tags
   c. Semi-passive Tags
   d. None of the above

Answer: (c)

Justification: Please refer to Slide 12 of Lecture 3 of Week 11

---

11. Match the following.

Types of Network Security	Description
1. Firewalls	i. Provide access based on user identity
2. Intrusion prevention systems	ii. Scan for malware detection and prevention
3. Access control	iii. Barrier between the trusted internal network and the external networks
4. Antivirus and antimalware software	iv. Detection and blocking attacks

a. 1-iii, 2-iv, 3-i, 4-ii
b. 1-ii, 2-iii, 3-iv, 4-i
c. 1-i, 2-ii, 3-iii, 4-iv
d. 1-iv, 2-i, 3-ii, 4-iii

Answer: (a)

Justification: Please refer to Slide 12,14 of Lecture 4 of Week 11

---

12. Which of the following is an example of augmented reality?

a. Oculus Rift
b. Samsung Gear VR
c. Bus stop prank by Pepsi Max
d. Google Cardboard

Answer: (c)

Justification: Please refer to Slide 19,20 of Lecture 4 of Week 11

---

13. Which of the following represents IoT applications in facility management?

a. Smart meter
b. Security and safety alarms
c. Both (a) and (b)
d. Neither (a) nor (b)

Answer: (c)

Justification: Please refer to Slide 13,14 of Lecture 5 of Week 11

---

14. Which of the following does not represents the benefit of the IIoT applications in inventory management?

a. Automation in the process of inventory tracking and packing
b. Inability to recognize the reason behind the bottlenecks in the operation
c. Optimization of the amount of inventory
d. Real-time update of the quantity of inventory items, their location, and tracking

Answer: (b)

Justification: Please refer to the book: Introduction to Industry 4.0 and Industrial Internet of Things, Chapter- 15, page no.- 299

---

15. Which of the following can be achieved by performing analytics in facility management?

    a. Unmanaged energy consumption
    b. Unoptimized operational cost
    c. Remote monitoring of the facilities
    d. None of the above

Answer: (c)

Justification: Please refer to Slide 17 of Lecture 5 of Week 11

---

1. What are the benefits of using IoT in Oil and Gas Industries?

    a. Decreased production efficiency
    b. Save cost and time
    c. Deteriorate asset maintenance
    d. None of the above

Answer: (b)

Justification: Please refer to Slide 9 of Lecture 1 of Week 12

---

2. Which of the following statement does not represents the advantage of using IoT in the chemical industry?

    a. Predictive maintenance
    b. Reduce energy expenses
    c. Maximize supply chain risks
    d. Improve logistics

Answer: (c)

Justification: Please refer to Slide 11 of Lecture 1 of Week 12

---

3. What is/are the advantages of using IoT in the Pharmaceutical industry?

    a. Real-time monitoring
    b. Inability to control the areas remotely
    c. Increased production cost and wastage
    d. All of the above

Answer: (a)

Justification: Please refer to Slide 18 of Lecture 1 of Week 12

---

4. Which of the following can be performed through predictive maintenance?

    a. Address real-time issues
    b. Reduce equipment breakdown
    c. Efficient and effective maintenance
    d. All of the above

Answer: (d)

Justification: Please refer to Slide 12 of Lecture 1 of Week 12

---

5. State true or false — Through the application of IoT in the Pharmaceutical industry, it is possible to examine drugs and detect adverse drug reactions.

   a. True
   b. False

Answer: (a)

Justification: Please refer to Slide 19 of Lecture 1 of Week 12

---

6. Which of the following is true about the features of second-generation UAVs?

   a. Static design, fixing camera mount, still photography, video recording, and manual steering control
   b. Transformable designs, 1080 HD video or higher value instrumentation, three-axis gimbals
   c. Improved safety and regulatory, platform and payload adaptability, automated safety modes
   d. Enhanced intelligent piloting models and full autonomy, full airspace awareness, auto action

Answer: (a)

Justification: Please refer to Slide 4 of Lecture 2 of Week 12

---

7. What is/are the application field(s) of UAVs?

   a. Agriculture
   b. Mining
   c. Forestry
   d. All of the above

Answer: (d)

Justification: Please refer to Slide 5 of Lecture 2 of Week 12

8. Which of the following does not represents an application of UAV in Agriculture?

    a. Crop health monitoring
    b. Monitoring soil quality, counting plants, identifying plot size
    c. Inspect construction site infrastructure and construct roadways
    d. Increase effective yields

Answer: (c)

Justification: Please refer to Slides 6,7 and 8 of Lecture 2 of Week 12

---

9. State true or false — Precision forestry and canopy mapping cannot be performed through the application of UAV in forestry.

    a. True
    b. False

Answer: (b)

Justification: Please refer to Slides 18 of Lecture 2 of Week 12

---

10. Which of the following does not represents the application of UAVs for energy management?

    a. Optimized use of seed, fertilizer, and water
    b. Eliminate the need to get close to the dangerous wires
    c. Inspections without climbing power poles
    d. None of the above

Answer: (a)

Justification: Please refer to Slide 10 of Lecture 2 of Week 12

---

11. State true or false — One of the applications of UAVs in telecommunication is to perform tower inspection.

    a. True
    b. False

Answer: (a)

Justification: Please refer to Slide 13 of Lecture 2 of Week 12

---

12. Match the following.

Sector	Application of UAVs
1. Mining	i. Scan a large number of items available in a warehouse
2. Healthcare	ii. Regular surface survey for optimized blast design
3. Forestry	iii. Delivery of medicines, vaccines, and snake bite serum
4. Warehousing	iv. Display information about the forest species

    a.   1-iii, 2-iv, 3-i, 4-ii
    b.   1-ii, 2-iii, 3-iv, 4-i
    c.   1-i, 2-ii, 3-iii, 4-iv
    d.   1-iv, 2-i, 3-ii, 4-iii

Answer: (b)

Justification: Please refer to Slides 11,12,17 and 18 of Lecture 2 of Week 12

---

13. What is/are the application(s) of UAVs in oil and gas industry?
    a. Reducing manpower requirements and increasing safety by eliminating the need for industrial mountaineering
    b. Monitoring pipelines for detecting leakage of oil and gas pipelines
    c. Collecting videos and thermal imagery of oil and gas fields
    d. All of the above

Answer: (d)

Justification: Please refer to Slide 16 of Lecture 2 of Week 12

---

14. State true or false - UAV-based light displays are generally more expensive than traditional firework displays and cannot be reused.

    a. True
    b. False

Answer: (b)

Justification: Please refer to Slide 20 of Lecture 2 of Week 12

---

15. Which of the following is/are true about the necessity of case studies?

   a. The case study investigates real-life phenomena through a detailed analysis of related events.
   b. The case study generally selects a vast geographical area or a large number of individuals as the subject matter.
   c. Both (a) and (b)
   d. Neither (a) nor (b)

Answer: (a)

Justification: Please refer to Slide 3 of Lecture 3 of Week 12