Comms Training Module Quizzes without Answers

MODULE 1 – Introduction to ITS

1. Intelligent Transportation Systems (ITS) rely on?
    a. Wired technology
    b. Wireless technology
    c. Both wired and wireless technology
    d. Neither wired or wireless technology
2. Onboard Units (OBUs) receiving Basic Safety Messages (BSM) from surrounding vehicles is an example of?
    a. Vehicle to Vehicle (V2V)
    b. Vehicle to Infrastructure (V2I)
    c. Vehicle to Pedestrian (V2P)
    d. Vehicle to Everything (V2X)
3. Roadside Units (RSUs) transmitting information about signal phase and the timing (SPaT) to approaching Onboard Units (OBUs) is an example of?
    a. Vehicle to Vehicle (V2V)
    b. Vehicle to Infrastructure (V2I)
    c. Vehicle to Pedestrian (V2P)
    d. Vehicle to Everything (V2X)
4. Safe and efficient transportation, infrastructure, and services is provided to citizens by?
    a. Original Equipment Manufacturers (OEMs)
    b. Infrastructure Owner Operators (IOOs)
    c. Third-party Navigation Application Providers
5. Vehicles and accompanying software are designed and produced by?
    a. Original Equipment Manufacturers (OEMs)
    b. Infrastructure Owner Operators (IOOs)
    c. Third-party Navigation Application Providers

MODULE 2 – Background Knowledge

1. A lower frequency signal?
    a. Travels further than a higher frequency signal of the same power
    b. Degrades less when passing through objects, but has a lower data transmission speed
    c. Degrades more when passing through objects, but has a higher transmission speed
    d. A and C
    e. A and B
2. The amount of data that can be transmitted at a given time through a single connection to one or multiple devices is referred to as?
    a. Latency
    b. Interference
    c. Transmission Speed
    d. Bandwidth
3. The volume of information that can be sent through a connection over a period of time is referred to as?
    a. Latency
    b. Interference
    c. Transmission Speed
    d. Bandwidth
4. Higher security measures for sensitive/proprietary data do not need to be considered if data security measures are already in place.
    a. True
    b. False
5. Costs for technology implementations can vary based on?
    a. Supplier and model
    b. Current network infrastructure and regional limitations
    c. Legacy equipment
    d. All of the above

MODULE 3 – Introduction to Wireless Communications

1. Wireless communications have many advantages over wired communications in connected vehicle applications, including?
    a. Increased mobility
    b. Reduced cost of implementation
    c. Less potential for interference
    d. A and B
    e. A and C
2. Connected Vehicle Messaging does not need to be exchanged rapidly.
    a. True
    b. False
3. A Security Credential Management System (SCMS) is used to help ensure the integrity, authenticity, privacy, and interoperability of transmitted messages.
    a. True
    b. False
4. Standardized protocols and message sets for vehicle communications have been developed by?
    a. Industry Owner Operators (IOOs)
    b. The International Society of Automotive Engineers (SAE International)
    c. The Institute of Electrical and Electronics Engineers (IEEE)
    d. None of the above
5. J2735 and J2945 are?
    a. A protocol standard that defines the types of transmissions permitted on a given radio frequency
    b. A set of data privacy regulations applicable to wireless transmissions
    c. A data dictionary that specifies data frames and elements required for standardized message sets
    d. None of the above

MODULE 4 – Connected Vehicle Technology

1. Which Connected Vehicle Technology has the longer range with a clear Line of Sight (LOS)?
    a. Dedicated Short-Range Communications (DSRC)
    b. Cellular Vehicle to Everything (C-V2X)
2. Which Connected Vehicle Technology communicates from one device to another instead of using a network?
    a. Dedicated Short-Range Communications (DSRC)
    b. Cellular Vehicle to Everything (C-V2X)
3. DSRC and C-V2X communications are less secure compared to other wireless alternatives.
    a. True
    b. False
4. The FCC ruling to reallocate part of the frequency spectrum allows for which the following?
    a. More Wi-Fi channels
    b. More C-V2X channels
    c. More DSRC channels
    d. A and B
    e. A and C
5. In response to the FCC ruling to reallocate part of the frequency spectrum, mobile network providers are considering solutions like Multi-access Edge Computing (MEC) to?
    a. Steer network traffic through existing cell tower systems
    b. Provide high reliability and low latency
    c. A and B
    d. None of the above

MODULE 5 – Intelligent Transportation Systems Technology

1. Which generation of cellular network hardware is more expensive?
    a. 2G
    b. 3G
    c. 4G
    d. 5G
2. Which band of the 5G Cellular Network has less speed but an increased range?
    a. Low Band
    b. Mid Band
    c. Millimeter Wave
3. Which 5G Cellular Network band has the fastest transmission speed and can be used for HD video monitoring and cloud computing?
    a. Low Band
    b. Mid Band
    c. Millimeter Wave
4. Which Citizens Broadband Radio Service (CBRS) tier holds priority over the other tiers and is used by United States military radars, fixed-station satellites, and wireless internet service providers?
    a. Priority Access License tier
    b. Incumbent tier
    c. Generalized Authorized Access Tier
    d. Common Access License tier
5. CBRS requires a Priority Access License (PAL) to maintain high reliability and must be purchased in each jurisdiction of use. For this reason, CBRS is seen as an option for:
    a. Research and development
    b. Local deployment
    c. Broad deployment
    d. None of the above

MODULE 6 – Enabling Technology

1. Most modern Wi-Fi connections are “dual band,” meaning they can operate in the 2.4 or 5 GHz range.
    a. True
    b. False
2. Which wireless technology provides the fastest transmission speed?
    a. Wi-Fi
    b. Bluetooth
    c. Low-power wide-area network (LPWAN)
    d. Fiber
3. Wi-Fi and Bluetooth are short-range technologies that can operate in the 2.4 GHz frequency band.
    a. True
    b. False
4. Which wireless technology has the longest range?
    a. Wi-Fi technology
    b. Bluetooth technology
    c. Low-power wide-area network (LPWAN)
    d. Fiber
5. Most LPWAN technologies are one-way communication from the radio to the server.
    a. True
    b. False

MODULE 7 – Introduction to Wired Communications

1. Wired technology is becoming outdated and is less present in Intelligent Transportation Systems.
    a. True
    b. False
2. Wired technology is less prone to interference and data loss compared to wireless technology.
    a. True
    b. False
3. Which type of technology has faster speeds overall?
    a. Wireless technology
    b. Wired technology
4. Which type of technology is considered less secure?
    a. Wireless technology
    b. Wired technology
5. Wired technology implementations that require cable burying are?
    a. Quick and easy to implement
    b. Physically difficult to implement
    c. Inexpensive to implement
    d. A and C

MODULE 8 – Between System Technology

1. Fiber optic cable transfers data by:
    a. Electric current through a copper cable
    b. Light through the glass core of a polymer cable
    c. Digital waves through the air
    d. A and B
2. Which of the following statements is false?
    a. Fiber optic cable is difficult to splice and repair
    b. Fiber optic cable is ideal for higher bandwidth applications
    c. Fiber optic cable is highly durable and can be put under significant pressure
    d. Fiber optic cable is expensive to manufacture and install
3. Which wired technology is the most common for internet traffic?
    a. RS-485
    b. Ethernet
    c. CAN bus
    d. Wi-Fi
4. An ethernet connection is considered more secure than a Wi-Fi network.
    a. True
    b. False
5. Universal Serial Bus (USB) communications are secure and encrypted by default
    a. True
    b. False

MODULE 9 – Within System Technology

1. Traffic signal control components such as sensors are often connected using which wired technology?
    a. Fiber
    b. RS-485
    c. CAN bus
    d. LPWAN
2. RS-485 data speed is a function of cable length.
    a. True
    b. False
3. CAN bus uses less power than RS-485.
    a. True
    b. False
4. Which technology reduces latency and the amount of wiring required in a device?
    a. RS-485
    b. Ethernet
    c. CAN bus
    d. LPWAN
5. The use of CAN flexible data requires a license.
    a. True
    b. False

MODULE 10 – ITS Use Cases

1. Intelligent Transportation Systems utilize a combination of wired and wireless technology?
    a. True
    b. False
2. RSUs can only be mounted to stationary infrastructure?
    a. True
    b. False
3. RSUs receive data from?
    a. Other RSUs and OBUs
    b. TOCs
    c. Sensors and radar
    d. A and B
    e. A, B, and C
4. Ethernet communications can be converted to?
    a. Fiber
    b. Wi-Fi
    c. Cellular
    d. All of the above
5. Connected vehicle and infrastructure communication devices transmit data via multiple technologies. Which two of the following four combinations is accurate?
    #1 - RSUs via C-V2X and ethernet to fiber
    #2 - RSUs via C-V2X and CAN Bus to USB
    #3 - OBUs via C-V2X and ethernet to fiber
    #4 - OBUs via C-V2X and CAN Bus to USB
    a. #1 and #3
    b. #1 and #4
    c. #2 and #3
    d. #2 and #4

Overall Test

1. Onboard Units (OBUs) receiving Basic Safety Messages (BSMs) from surrounding vehicles is an example of?
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4. Higher security measures for sensitive/proprietary data do not need to be considered if data security measures are already in place.
    a. True
    b. False
5. Connected Vehicle Messaging does not need to be exchanged rapidly.
    a. True
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6. Standardized protocols and message sets for vehicle communications have been developed by?
    a. Industry Owner Operators (IOOs)
    b. The International Society of Automotive Engineers (SAE International)
    c. The Institute of Electrical and Electronics Engineers (IEEE)
    d. None of the above
7. DSRC and C-V2X communications are less secure compared to other wireless alternatives.
    a. True
    b. False
8. The FCC ruling to reallocate part of the frequency spectrum allows for which the following?
    a. More Wi-Fi channels
    b. More C-V2X channels
    c. More DSRC channels
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9. Which band of the 5G Cellular Network has less speed but an increased range?
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    b. Mid Band
    c. Millimeter Wave
10. CBRS requires a Priority Access License (PAL) to maintain high reliability and must be purchased in each jurisdiction of use. For this reason, CBRS is seen as an option for:
    a. Research and development
    b. Local deployment
    c. Broad deployment

    d. None of the above
11. Which wireless technology provides the fastest transmission speed?
    a. Wi-Fi
    b. Bluetooth
    c. Low-power wide-area network (LPWAN)
    d. Fiber
12. Which wireless technology has the longest range?
    a. Wi-Fi technology
    b. Bluetooth technology
    c. Low-power wide-area network (LPWAN)
    d. Fiber
13. Wired technology is less prone to interference and data loss compared to wireless technology.
    a. True
    b. False
14. Which type of technology has faster speeds overall?
    a. Wireless technology
    b. Wired technology
15. Which of the following statements is false?
    a. Fiber optic cable is difficult to splice and repair
    b. Fiber optic cable is ideal for higher bandwidth applications
    c. Fiber optic cable is highly durable and can be put under significant pressure
    d. Fiber optic cable is expensive to manufacture and install
16. Which wired technology is the most common for internet traffic?
    a. RS-485
    b. Ethernet
    c. CAN bus
    d. Wi-Fi
17. RS-485 data speed is a function of cable length.
    a. True
    b. False
18. The use of CAN flexible data requires a license.
    a. True
    b. False
19. Ethernet communications can be converted to?
    a. Fiber
    b. Wi-Fi
    c. Cellular
    d. All of the above
20. Connected vehicle and infrastructure communication devices transmit data via multiple technologies. Which two of the following four combinations is accurate?

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    #2 - RSUs via C-V2X and CAN Bus to USB

    #3 - OBUs via C-V2X and ethernet to fiber

    #4 - OBUs via C-V2X and CAN Bus to USB
    a. #1 and #3
    b. #1 and #4
    c. #2 and #3
    d. #2 and #4