

Comms Training Module Quizzes with Answers

MODULE 1 – Introduction to ITS

1. Intelligent Transportation Systems (ITS) rely on? (Answer C)
 - 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? (Answer A)
 - 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? (Answer B)
 - 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? (Answer B)
 - 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? (Answer A)
 - 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? (Answer E)
 - 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? (Answer D)
 - 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? (Answer C)
 - 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. (Answer B)
 - a. True
 - b. False
5. Costs for technology implementations can vary based on? (Answer D)
 - 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? (Answer D)
 - 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. (Answer B)
 - 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. (Answer A)
 - a. True
 - b. False
4. Standardized protocols and message sets for vehicle communications have been developed by? (Answer B)
 - 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? (Answer C)
 - 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)? (Answer B)
 - 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? (Answer A)
 - 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. (Answer B)
 - a. True
 - b. False
4. The FCC ruling to reallocate part of the frequency spectrum allows for which the following? (Answer D)
 - 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? (Answer C)
 - 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? (Answer D)
 - a. 2G
 - b. 3G
 - c. 4G
 - d. 5G
2. Which band of the 5G Cellular Network has less speed but an increased range? (Answer A)
 - 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? (Answer C)
 - 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? (Answer B)
 - 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: (Answer A)
 - 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. (Answer A)
 - a. True
 - b. False
2. Which wireless technology provides the fastest transmission speed? (Answer A)
 - 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. (Answer A)
 - a. True
 - b. False
4. Which wireless technology has the longest range? (Answer C)
 - 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. (Answer A)
 - a. True
 - b. False

MODULE 7 – Introduction to Wired Communications

1. Wired technology is becoming outdated and is less present in Intelligent Transportation Systems.
(Answer B)
 - a. True
 - b. False
2. Wired technology is less prone to interference and data loss compared to wireless technology.
(Answer A)
 - a. True
 - b. False
3. Which type of technology has faster speeds overall? (Answer B)
 - a. Wireless technology
 - b. Wired technology
4. Which type of technology is considered less secure? (Answer A)
 - a. Wireless technology
 - b. Wired technology
5. Wired technology implementations that require cable burying are? (Answer B)
 - 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: (Answer B)
 - 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? (Answer C)
 - 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? (Answer B)
 - a. RS-485
 - b. Ethernet
 - c. CAN bus
 - d. Wi-Fi
4. An ethernet connection is considered more secure than a Wi-Fi network. (Answer A)
 - a. True
 - b. False
5. Universal Serial Bus (USB) communications are secure and encrypted by default (Answer B)
 - a. True
 - b. False

MODULE 9 – Within System Technology

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

MODULE 10 – ITS Use Cases

1. Intelligent Transportation Systems utilize a combination of wired and wireless technology? (Answer A)
 - a. True
 - b. False
2. RSUs can only be mounted to stationary infrastructure? (Answer B)
 - a. True
 - b. False
3. RSUs receive data from? (Answer E)
 - 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? (Answer D)
 - 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? (Answer B)

#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? (Answer A)
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 - b. Vehicle to Infrastructure (V2I)
 - c. Vehicle to Pedestrian (V2P)
 - d. Vehicle to Everything (V2X)
2. Roadside Units (RSUs) transmitting information about signal phase and the timing (SPaT) to approaching Onboard Units (OBUs) is an example of? (Answer B)
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 - c. Vehicle to Pedestrian (V2P)
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 - c. Transmission Speed
 - d. Bandwidth
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 - a. True
 - b. False
5. Connected Vehicle Messaging does not need to be exchanged rapidly. (Answer B)
 - a. True
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6. Standardized protocols and message sets for vehicle communications have been developed by? (Answer B)
 - 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. (Answer B)
 - a. True
 - b. False
8. The FCC ruling to reallocate part of the frequency spectrum allows for which the following? (Answer D)
 - a. More Wi-Fi channels
 - b. More C-V2X channels
 - c. More DSRC channels
 - d. A and B
 - e. A and C
9. Which band of the 5G Cellular Network has less speed but an increased range? (Answer A)
 - a. Low Band
 - 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: (Answer A)
 - a. Research and development

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- b. Local deployment
 - c. Broad deployment
 - d. None of the above
11. Which wireless technology provides the fastest transmission speed? (Answer A)
- a. Wi-Fi
 - b. Bluetooth
 - c. Low-power wide-area network (LPWAN)
 - d. Fiber
12. Which wireless technology has the longest range? (Answer C)
- 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. (Answer A)
- a. True
 - b. False
14. Which type of technology has faster speeds overall? (Answer B)
- a. Wireless technology
 - b. Wired technology
15. Which of the following statements is false? (Answer C)
- 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? (Answer B)
- a. RS-485
 - b. Ethernet
 - c. CAN bus
 - d. Wi-Fi
17. RS-485 data speed is a function of cable length. (Answer A)
- a. True
 - b. False
18. The use of CAN flexible data requires a license. (Answer A)
- a. True
 - b. False
19. Ethernet communications can be converted to? (Answer D)
- 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? (Answer B)
- #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

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- b. #1 and #4
- c. #2 and #3
- d. #2 and #4