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NEWS

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- Based on *Avionics News* issues from 2020.
- Grade of 85 percent or better required for credit.
- Work individually; choose best available answer.
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2020 Avionics News Training Exam



JANUARY

The View from Washington

1. According to the FAA's plain language tool kit, _____.
 - A. Must = Mandatory
 - B. Must Not = Prohibited
 - C. May = Recommended
 - D. All of the above
 - E. A and B only
2. The FAA's plain language tool kit notes that the term "should" means _____.
 - A. Mandatory
 - B. Optional
 - C. Recommended
 - D. None of the above

Theory and Practice: Numbers Racket

3. The reason we measure 60 seconds in a minute and 60 minutes in an hour is based on the _____.
 - A. Base-10 numbering system
 - B. Babylonian sexagesimal base-60 system
 - C. The same system as logic gates
 - D. None of the above
4. Modern computers are _____, where logic gates are _____.
 - A. Base-8, Base-2
 - B. Base-10, Base-64
 - C. Base-64, Base-2
 - D. Base-2, Base-10
5. Which of the following is the simplest numbering system in terms of symbology?
 - A. Binary
 - B. Hexadecimal
 - C. Decimal
 - D. Octal

6. ARINC 429 uses _____ numbering, which has the advantage of being able to represent large numbers with fewer symbols.
 - A. Binary
 - B. Hexadecimal
 - C. Decimal
 - D. Octal



FEBRUARY

The View from Washington

7. Which of the "Dirty Dozen" human error preconditions are considered regulatory?
 - A. Communication and complacency
 - B. Knowledge and communication
 - C. Resources and knowledge
 - D. Communication and resources

Frequently Asked Questions

8. If a technician is only performing the "check and inspect" functions of the 91.411 and 91.413 checks, he/she is not required to have a repairman's certificate.
- A. True
 - B. False
9. Test and inspect ____.
- A. Are not part of the definition of repair or alteration
 - B. Are functions a properly rated mechanic can perform while working for an appropriately rated repair station.
 - C. Are not part of the procedures found in 91.411 and 91.413
 - D. All of the above
 - E. A and B only

Theory and Practice: Logic

10. The rule for the NAND gate is "Not AND."
- A. True
 - B. False
11. The output of a NAND gate is ____ an AND gate.
- A. The same as
 - B. Equal to
 - C. Opposite of
 - D. None of the above

12. For a NOT gate, ____.
- A. Whatever the input is, the output isn't
 - B. Whatever the input is, the output is
 - C. Whatever the inputs are, the outputs are
 - D. There is no such thing as a NOT gate
13. In Boolean logic, all values are either true or false.
- A. True
 - B. False



MARCH

Weather: It's Live or Latent

14. FIS-B and SiriusXM weather products both require ____ to receive their data.
- A. 1090ES transponders
 - B. 978 MHz receivers
 - C. ADS-B Out compliant aircraft
 - D. Both A and C
15. NEXRAD radar ____.
- A. Is generated by capturing six 360-degree scans of its coverage area
 - B. Includes a base reflectivity scan .5 degrees above the horizon
 - C. Provides a three-dimensional depth to its weather imagery
 - D. All of the above
 - E. Both A and C only
16. The latency of weather information for FIS-B systems can be ____.
- A. Six seconds
 - B. One minute
 - C. Ten minutes
 - D. Twenty minutes
17. The ceiling for FIS-B is ____.
- A. 10,000 feet
 - B. 20,000 feet
 - C. 24,000 feet, although some data can be received at higher altitudes
 - D. FL390
18. Spherics devices can be used ____.
- A. To detect lightning strikes
 - B. For weather radar imagery
 - C. As a method to avoid thunderstorm turbulence
 - D. All of the above
 - E. A and C only



APRIL

Frequently Asked Questions

19. Parts traceability is defined as the ability to establish that a part or material was manufactured under Part 21 or were previously determined to be airworthy under Part 43.
 - A. True
 - B. False
20. Possible sources for making parts traceability determination may include _____.
 - A. Work orders
 - B. Invoices
 - C. TSO or PMA markings
 - D. All of the above
 - E. Both A and C only

Safety Alerts for Operators

21. Safety Alerts for Operators (SAFOs) and Information for Operators (InFOs) are used by the FAA when rulemaking will simply take too long for critical action to be taken or information distributed.
 - A. True
 - B. False

22. The intended audience for FAA's Safety Alerts for Operators (SAFOs) and Information for Operators (InFOs) includes _____.
 - A. Manufacturers
 - B. Repair stations
 - C. Operators
 - D. All of the above
 - E. B and C only

23. The responsibility to implement any action in an InFO rests with the operator, not the FAA inspector.
 - A. True
 - B. False

Theory and Practice

24. Which circuit uses the time constant from a capacitor and resistor to hold a transistor on for a short period of time before returning to its original, stable state?
 - A. Bistable multivibrator
 - B. Astable multivibrator
 - C. Monostable multivibrator
 - D. Flip-flop
25. The difference between an astable and bistable multivibrator is _____.
 - A. The number of outputs
 - B. The condition of the outputs
 - C. The bistable multivibrator will remain in a particular state until it is triggered
 - D. All of the above



MAY

Diversity

26. Benefits of a space-based ADS-B system include _____.
 - A. It can provide coverage over oceans
 - B. It doesn't require additional antenna installation
 - C. It doesn't require a ground network
 - D. All of the above
 - E. A and C only
27. RADAR (RAdio Detection and Ranging) in an air traffic control system is limited by _____.
 - A. Increases in distance to target
 - B. The amount of traffic the network can accommodate
 - C. Altitude reporting
 - D. All of the above
 - E. A and B only
28. With WAAS corrections, GPS signal accuracy improves from about 65 feet to about _____.
 - A. 50 feet
 - B. 27 feet
 - C. 11 feet
 - D. 6 feet

Theory & Practice

29. Flip-flop circuits can be used as ____.
- A. Counters
 - B. Registers
 - C. Memory
 - D. All of the above
30. T-Type flip flops are useful as ____.
- A. Binary counters
 - B. Delays
 - C. Frequency dividers
 - D. All of the above
 - E. A and C only
31. The behaviors of D-Type flip-flops are useful in creating a delay.
- A. True
 - B. False
32. J-K flip-flop circuits can behave the same as D-, T- and R-S type flip-flops.
- A. True
 - B. False



JUNE

Frequently Asked Questions

33. The provisions that allow repair stations to manufacture parts as part of maintenance include being a certificate holder, having a fabrication quality control system, and consuming the part in the maintenance or alteration procedure.
- A. True
 - B. False

34. A fabricated part is considered "consumed" in a repair when it ____.
- A. Is installed into the next higher assembly component part
 - B. Installed within a product by the fabricator
 - C. Both A and B
 - D. Neither A or B

Theory & Practice

35. Corrosion is a deterioration of material due to a reaction with the environment.
- A. True
 - B. False
36. Corrosion is either chemical or electrochemical and does not happen simultaneously.
- A. True
 - B. False
37. Failure modes caused by corrosion on multi-pin connectors can include ____.
- A. Structural deterioration, disintegration of insulation
 - B. Reduction of efficiency, high resistance at terminals
 - C. Impedance fluctuations, signal loss
 - D. Short circuits, intermittent operation, reduced reliability

38. Mechanical failure, short circuits, signal loss and intermittent operation are failure modes caused by corrosion for which of the following?
- A. Batteries
 - B. Busbars
 - C. Coaxial lines
 - D. Relay and switching systems
39. Electrochemical attack corrosion is the result of exposure of a bare metal surface to some type of caustic liquid or gas.
- A. True
 - B. False
40. Metals can have different electrical potential within different areas of the same piece.
- A. True
 - B. False
41. Another name for galvanic corrosion is ____.
- A. Surface corrosion
 - B. Dissimilar metal corrosion
 - C. Fretting corrosion
 - D. None of the above



JULY

Frequently Asked Questions

42. To return to service an aircraft or component of that aircraft, you must have maintenance and return to service authority granted by the state of registry of the aircraft.
- True
 - False
43. Return to service authority can be granted via ____.
- Direct regulatory authority
 - Bilateral Aviation Safety Agreement (BASA)
 - One-off civil aviation authority acceptance of you and your repair station
 - All of the above

Equipping EAB Aircraft for IFR

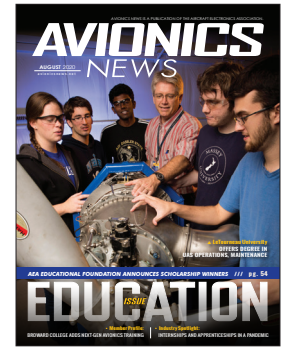
44. For IFR operations (in EAB aircraft) and to comply with ADS-B Out requirements, GPS equipment must meet ____.
- The performance requirements of TSO C129 for WAAS GPS
 - TSO C129
 - AC 20-138A
 - None of the above

45. None of the equipment installed in a homebuilt aircraft is required to be built under a TSO authorization.
- True
 - False

Theory and Practice

46. When connecting equipment to the voltage buss, there are two main factors to consider: ____.
- Length of wire and ambient temperature
 - Wire size and wire bundle
 - Voltage drop and heat
 - Current and wire length
47. Small diameter wire has less resistance than large diameter wire.
- True
 - False
48. The FAA's limit on allowable voltage drops in 14-volt systems is ____.
- 1 volt for anything that can be operated more than two minutes.
 - 2 volts for any intermittent load.
 - .5 volt for any intermittent load.
 - .5 volt for anything that can be operated more than two minutes.

49. An intermittent load is defined as a current draw lasting under ____.
- 10 seconds
 - 30 seconds
 - 1 minute
 - 2 minutes



AUGUST

The View from Washington

50. There is a regulatory requirement for a repair station internal evaluation program.
- True
 - False
51. Which of the following are related to discrepancies in your internal evaluation program?
- Findings
 - Analysis
 - Recommendations
 - All of the above
 - A and C only



SEPTEMBER

Frequently Asked Questions

52. Which of the following are considered maintenance tasks?
- Repair
 - Inspection
 - Preservation
 - All of the above
 - None of the above

53. A visual examination or manual check to determine the condition of an aircraft component is considered ____.

- A. Preventative maintenance
- B. Overhaul
- C. Inspection
- D. Repair

54. Which of the following is the restoration of an airframe, powerplant, propeller, or appliance to a condition for safe operation after damage or deterioration is considered?

- A. Overhaul
- B. Repair
- C. Preventative maintenance
- D. Maintenance

Theory & Practice

55. Three factors important to consider in antenna theory include: ____.

- A. Shape, location, size
- B. Type, frequency, mounting surface
- C. Reception, grounding, wavelength
- D. Wavelength, efficiency, rule of reciprocity

56. Wavelength is calculated by dividing the speed of light by the frequency.

- A. True
- B. False

57. Higher frequencies have ____ wavelengths and ____ antennas.

- A. Shorter, longer
- B. Longer, shorter
- C. Shorter, shorter
- D. Longer, longer

58. Balanced loop antennas (towel bars) are a form of ____ antennas.

- A. Marconi
- B. Dipole
- C. Isotropic radiator
- D. None of the above

59. VOR/LOC and glideslope receivers require a ____.

- A. Hertzian antenna
- B. Balun
- C. Transformer
- D. All of the above
- E. A and C only



OCTOBER

Frequently Asked Questions

60. The name of a repair station, air carrier or manufacturer may not be used as the signature of the person approving an article for return to service.

- A. True
- B. False

61. For a large maintenance action, the name of every employee who touched that article would be listed in the maintenance record for a single return to service.

- A. True
- B. False

Theory & Practice

62. The wire that carries the signal between the avionics radio and the antenna is called the ____.

- A. Harness
- B. Transmission line
- C. Cable
- D. Conductor

63. The best material for coaxial cable dielectric is ____.

- A. Copper
- B. Teflon
- C. Stranded wire
- D. Air

64. The "surge" impedance of coax for aviation is ____ that of the coax used for cable television.

- A. Greater than
- B. Less than
- C. Equal to

65. A rule for installing coaxial cable is to keep the distance between the antenna and the radio as short as possible to prevent signal loss.

- A. True
- B. False

66. In a transmitter, the radio wave traveling from the transmitter toward the antenna is called ____.

- A. Standing wave
- B. Wavelength
- C. Reflected wave
- D. Incident wave

67. The interaction between an incident wave and a reflected wave will cause a standing wave.

- A. True
- B. False



NOVEMBER

Theory & Practice

68. When a pilot squawks no reception of their outer marker but the middle marker works it may be an indication of a problem with the ____.

- A. Antenna
- B. Inner marker
- C. Coaxial cable
- D. All of the above
- E. Both A and C only

69. VHF communication antennas and transmission lines are among the easiest to troubleshoot because they transmit, which allows problems to become more obvious.

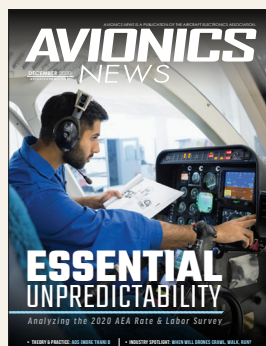
- A. True
- B. False

70. A Thruline wattmeter is used for ____.

- A. Reading power moving toward the antenna
- B. Reading rejected power coming back from the antenna
- C. Checking frequencies at the high end, middle and low end of the communications band
- D. All of the above
- E. None of the above

71. Time domain reflectors (TDR) are like radar for coaxial cable.

- A. True
- B. False



DECEMBER

Theory & Practice

72. An important difference between Mode S transponders and ADS-B systems is the ability of ADS-B systems to report ____.

- A. Aircraft speed
- B. Altitude
- C. Position
- D. Aircraft identifier

73. The 978 MHz frequency used by UATs for ADS-B is also one of the frequencies used by ____.

- A. ADF
- B. TCAS
- C. DME
- D. VOR

74. ADS provides air traffic controllers updated information nearly five times faster than the older SSR system.

- A. True
- B. False

75. The accuracy and reliability reporting for ADS-B equipment consists of a number that indicates the radius to which position errors are contained and is referred to as ____.

- A. System Design Assurance (SDA)
- B. System Integrity Level (SIL)
- C. Navigation Integrity Category (NIC)
- D. Emitter Code

Full Name: _____ Date: _____
(please print legibly)

Company: _____

Address: _____ City: _____ State/Province: _____ Zip/Postal Code: _____

Phone: _____ Email Address: _____

The answers to this exam are all available at your fingertips — simply refer to the 2020 back issues of *Avionics News* or go to avionicsnews.net to search the archives. Answer 85 percent of the questions correctly, and you will receive a certificate of completion to submit to your FSDO and to the AEA for training credit. AEA members can visit aea.net/training for information about applying for credit toward the 2020 Avionics Training Excellence Award. This test also can be taken and submitted online at avionicsnews.net. Or, complete this answer sheet, and then email it to info@aea.net.

Important date:

April 1, 2021

Deadline to submit application (with exams) for credit toward the AEA's 2020 Avionics Training Excellence Award.

Choose the best available answer. Work individually.

(T) (F)

1. [A] [B] [C] [D] [E]

2. [A] [B] [C] [D] [E]

3. [A] [B] [C] [D] [E]

4. [A] [B] [C] [D] [E]

5. [A] [B] [C] [D] [E]

6. [A] [B] [C] [D] [E]

7. [A] [B] [C] [D] [E]

8. [A] [B] [C] [D] [E]

9. [A] [B] [C] [D] [E]

10. [A] [B] [C] [D] [E]

11. [A] [B] [C] [D] [E]

12. [A] [B] [C] [D] [E]

13. [A] [B] [C] [D] [E]

14. [A] [B] [C] [D] [E]

15. [A] [B] [C] [D] [E]

16. [A] [B] [C] [D] [E]

17. [A] [B] [C] [D] [E]

18. [A] [B] [C] [D] [E]

19. [A] [B] [C] [D] [E]

20. [A] [B] [C] [D] [E]

21. [A] [B] [C] [D] [E]

22. [A] [B] [C] [D] [E]

23. [A] [B] [C] [D] [E]

24. [A] [B] [C] [D] [E]

25. [A] [B] [C] [D] [E]

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26. [A] [B] [C] [D] [E]

27. [A] [B] [C] [D] [E]

28. [A] [B] [C] [D] [E]

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43. [A] [B] [C] [D] [E]

44. [A] [B] [C] [D] [E]

45. [A] [B] [C] [D] [E]

46. [A] [B] [C] [D] [E]

47. [A] [B] [C] [D] [E]

48. [A] [B] [C] [D] [E]

49. [A] [B] [C] [D] [E]

50. [A] [B] [C] [D] [E]

(T) (F)

51. [A] [B] [C] [D] [E]

52. [A] [B] [C] [D] [E]

53. [A] [B] [C] [D] [E]

54. [A] [B] [C] [D] [E]

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58. [A] [B] [C] [D] [E]

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60. [A] [B] [C] [D] [E]

61. [A] [B] [C] [D] [E]

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63. [A] [B] [C] [D] [E]

64. [A] [B] [C] [D] [E]

65. [A] [B] [C] [D] [E]

66. [A] [B] [C] [D] [E]

67. [A] [B] [C] [D] [E]

68. [A] [B] [C] [D] [E]

69. [A] [B] [C] [D] [E]

70. [A] [B] [C] [D] [E]

71. [A] [B] [C] [D] [E]

72. [A] [B] [C] [D] [E]

73. [A] [B] [C] [D] [E]

74. [A] [B] [C] [D] [E]

75. [A] [B] [C] [D] [E]