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JANUARY 2012

Frequently Asked Questions – United States

1. Any authority a repair station has for line maintenance must be included and cannot exceed its ratings and limitations referenced in §145.201.
- A. True
B. False

Frequently Asked Questions – Canada

2. Transport Canada acceptance of RTCA DO-313 for installation of cabin systems and equipment is limited to the electrical elements of the installation and does not extend to other disciplines like structures.
- A. True
B. False

International News & Regulatory Updates

3. Galileo is a European program for a global sat/nav system that will offer which of the following?
- A. Safety-of-life services
B. Real-time weather services
C. Free open service to users with a compatible receiver
D. All of the above
E. Both A and C only

4. EGNOS is the satellite augmentation system which
- A. Improves accuracy of GPS signals from 10 to 2 meters
B. Is similar to WAAS in the United States
C. Covers most European states
D. All of the above
E. None of the above

FEBRUARY 2012

Frequently Asked Questions – United States

5. The common reference to “the” repair station manual may actually include which of the following separate manuals?
- A. SMS program, operation specifications and capabilities list
B. Quality control manual (QCM), repair station manual (RSM) and SMS program
C. Quality control manual (QCM), repair station manual (RSM) and repair station training program manual
D. Repair station manual (RSM), SMS program and operations specifications
6. The repair station manual (RSM) defines the _____ of the repair station, and the quality control manual (QCM) defines the _____.
- A. personnel, processes
B. capabilities, procedures
C. processes, procedures
D. infrastructure, processes

7. Guidance for developing the RSM and QCM can be found in which of the following?

- A. Advisory Circular 145-9
B. §145.209
C. §145.211
D. None of the above

Frequently Asked Questions – Europe

8. Under the new grouping of aircraft type ratings in EU Regulation 1149/2011, a Cessna 172 would be considered a _____.
- A. Group 1 aircraft
B. Group 2 aircraft
C. Group 3 aircraft
D. None of the above
9. Under the new grouping of aircraft type ratings in EU Regulation 1149/2011, a Boeing 737 would be considered a _____.
- A. Group 1 aircraft
B. Group 2 aircraft
C. Group 3 aircraft
D. None of the above

Retrofitting for RNP

- 10.** Required navigation performance (RNP) approaches, such as RNP-10 or RNP-0.1, _____.
- A. Are authorized for all air carrier aircraft
 - B. Denote a performance requirement in nautical miles, such as 10nm and .1nm, respectively
 - C. Are accuracy designations only and do not have any signal integrity requirements
 - D. All of the above
- 11.** The performance requirements for RNP are simply accuracy-based and do not include availability, integrity and continuity criteria.
- A. True
 - B. False
- 12.** To fly an RNP-1 procedure, the avionics and pilot are required to maintain aircraft position within one nautical mile of the desired track 95 percent of the time.
- A. True
 - B. False
- 13.** Which of the following nav-aids can be used to meet the performance goals of RNP?
- A. GPS
 - B. DME
 - C. Inertial navigation system (INS)
 - D. A and C only
 - E. All of the above
- 14.** Which of the following statements is true?
- A. An approach to LPV minimums has no RNP equivalent
 - B. RNP-AR approaches are equivalent to category II/III ILS approaches
 - C. A difference between RNAV(GPS) approach and a true RNP approach is the radius to fix capability.
 - D. A and C only
 - E. B and C only

Runway Incursions – Not Just a Pilot Problem

- 15.** Taxi lanes, aprons and ramps make up the non-movement area of an airport and _____.
- A. are not under the control of air traffic
 - B. are controlled by air traffic
 - C. are the responsibility of pilots, mechanics, aircraft operators and airport management
 - D. Both A and C
 - E. Both B and C
- 16.** Wide white-painted edge lines with a dashed centerline identify _____, while double yellow-painted edge lines with a solid yellow centerline mark _____.
- A. Runway, aprons
 - B. Taxi lanes, ramps
 - C. Taxiways, hangar floors
 - D. Runways, taxiways

MARCH 2012

Frequently Asked Questions – United States

- 17.** For a follow-on installation to an STC: if the installation and subsequent modification constitute a major change in type design, then the modifier must _____.
- A. Apply for an STC
 - B. Follow regulations for a major alteration
 - C. Follow regulations for a minor alteration
 - D. Use a field approval
- 18.** Most avionics systems are approved via an AML STC for business reasons and not because the installation is a major change in type design.
- A. True
 - B. False

- 19.** If an installation is not a major change in type design or a major alteration, then by regulation it must be _____.
- A. a supplemental type certificate
 - B. field approval
 - C. minor alteration
 - D. None of the above
- 20.** Follow-on installations to an STC _____.
- A. Require careful analysis by the evaluator/installer
 - B. Require an STC
 - C. May be minor alterations
 - D. Both A and B
 - E. Both A and C

APRIL 2012

Frequently Asked Questions – United States

- 21.** For aircraft that operate above 15,000 feet, which of the following transponders would be required in North America?
- A. TSO-C74c Class 1A
 - B. TSO-C74c Class 1B
 - C. TSO-112c Level 2 Class 2
 - D. None of the above
- 22.** The minimum peak output power levels as designated by RTCA/DO181D for transponders certified to TSO-C112c are _____.
- A. 125 watts for Class 1 and Class 2
 - B. 125 watts for Class 1 and 70 watts for Class 2
 - C. 70 watts for Class 1 and Class 2
 - D. None of the above

- 23.** An amendment to TSO-C112c changes the wording of transponder classes where “level” now refers to _____ and “class” refers to _____.
- A. Minimum altitude, cruise speed
 - B. Power output, altitude limitations
 - C. Communication capabilities, minimum power output
 - D. MOPS, altitude

Aircraft Electrical Wiring

- 24.** A study conducted by Raytheon Technical Services found that most aircraft wiring failures occur _____.
- A. Within 3 inches of a back of a connector
 - B. Near loose or misaligned clamps
 - C. Due to insufficient strain relief
 - D. All of the above
 - E. Both A and C only
- 25.** ASTM standards for electrical wiring can be used for reference when substituting wiring (finding an acceptable replacement) in the absence of a manufacturer’s standard.
- A. True
 - B. False

MAY 2012

Frequently Asked Questions – United States

- 26.** The criteria used for the approval of an installation/modification should be the same one used for removal of the installation/modification.
- A. True
 - B. False

- 27.** The establishment of AML STCs for avionics systems (AC 23-22) was based on _____.
- A. Streamlining the field approval process
 - B. FAA’s desire to eliminate one-off STCs
 - C. Standardizing major alterations
 - D. Need for a higher level of approval because GPS is new and novel technology

Global Complications – Avionics for International Flight

- 28.** Which of the following communications technologies is limited to line-of-sight operation (approx 150 nm or less)?
- A. HF
 - B. Iridium
 - C. VHF
 - D. None of the above
- 29.** For transoceanic and remote operations, which of the following systems can provide an effective and flexible back up to HF communications?
- A. Iridium satcom
 - B. VHF
 - C. HF is the only solution for transoceanic and remote operations
 - D. None of the above
- 30.** For oceanic and remote operations, which of the following systems operate on a line-of sight basis and need to be supplemented by other navigation technologies?
- A. VOR
 - B. DME
 - C. TACAN
 - D. All of the above

- 31.** In the U.S., an appropriately TSO’d GPS receiver can be used in place of an ADF for NDB navigation.
- A. True
 - B. False
- 32.** Which of the following position reporting and surveillance systems is required for IFR operations in Europe?
- A. Mode A Transponder
 - B. Mode C transponder
 - C. Mode S transponder
 - D. ADS-B transponder

- 33.** Which of the following statements are true?
- A. RNP-5 is required for IFR operations in European airspace
 - B. All jet operations in Europe require a flight data recorder
 - C. The FAA is supporting both 978 MHz UAT and 1090 MHz Mode S for ADS-B equipment
 - D. All of the above
 - E. Both A and C only

JUNE 2012

Frequently Asked Questions – United States

- 34.** With regards to the field approval process, an ASI’s Order may refer to an alteration as EVL, which means _____.
- A. The alteration will require an STC
 - B. The alteration must be evaluated by the ACO
 - C. The alteration may be eligible for an approval other than an STC
 - D. None of the above

35. With regards to the field approval process, an ASI's Order may refer to an alteration as ENG, which means _____.

- A. *The alteration will require an STC*
- B. *The alteration may require supporting DER or ODA engineering data*
- C. *The alteration may require concurrence from the ACO for issuance of a field approval*
- D. *Both A and C*
- E. *Both B and C*

36. An applicant who employs an authorized DER to support a major alteration has no further requirement for approval from an ASI, if the data addresses the entire alteration or repair and all of the requirements of Parts 21 and 43.

- A. *True*
- B. *False*

JULY 2012

Frequently Asked Questions - United States

37. In reference to replacement and modification parts, nuts and bolts would be defined as _____.

- A. *Those produced under a type certificate*
- B. *Parts produced by an owner or operator for maintaining or altering their own product*
- C. *Standard parts manufactured in compliance with a government or industry standard*
- D. *None of the above*

38. Manufacturers and distributors must have some form of FAA approval for their replacement or modification parts for type-certificated aircraft, where installers may have instances where no explicit approval requirement exists.

- A. *True*
- B. *False*

Glass Panel Upgrades - Best Practices for Retrofit Installations

39. Which of the following are suggestions for ensuring a smooth retrofit of glass panel avionics?

- A. *Perform an electrical load analysis of the aircraft*
- B. *Consider HIRF/EMI requirements for the new equipment*
- C. *Get certification people involved early in the process for custom installations*
- D. *All of the above*
- E. *Both A and C only*

40. Any retrofit of a glass panel in an LSA is a major modification and has to go through the airframe manufacturer.

- A. *True*
- B. *False*

41. With homebuilt experimental aircraft, the homebuilder is the manufacturer but still needs airframe manufacturer approval to approach a certified repair station for assistance in installing equipment.

- A. *True*
- B. *False*

AUGUST 2012

Lightening the Load

42. Advantages of LED (light-emitting diode) lights include which of the following?

- A. *Operate at a fraction of the power requirements of incandescent bulbs*
- B. *Produce less heat during operation*
- C. *Do not last as long as incandescent bulbs*
- D. *Both A and C only*
- E. *Both A and B only*

43. Incandescent bulbs can use current amounts in the _____ range where LEDs can operate in the _____ range on typical GA aircraft applications.

- A. *4-6 amp; 50-60 amp*
- B. *.25-1.5 amp; 4-6 amp*
- C. *50-60 amp; .25-1.5 amp*
- D. *4-6 amp; .25-1.5 amp*

44. LED landing lights are rated for a life expectancy of _____.

- A. *20 hours*
- B. *5,000 landings*
- C. *5,000 hours or more under power*
- D. *1,000 hours on airframe*

SEPTEMBER 2012

Frequently Asked Questions - United States

45. Portable ADS-B units in aircraft intended to fly in ADS-B airspace _____.

- A. *Would only be usable for receiving FIS-B services for situational awareness*
- B. *Are compliant to 91.225 and 91.227 and can be used in lieu of panel-mounted equipment*
- C. *Are certified installations in everything except glider aircraft.*
- D. *All of the above*

Frequently Asked Questions - Latin America

46. There are no specific requirements in the Brazilian Civil Aviation Regulations applicable to the certification of paints, greases, lubricants and cleaning products in aircraft maintenance, manufacturing or operation.

- A. *True*
- B. *False*

Aircraft as Antenna Farm

- 47.** Antennae cannot be considered to connect circuits because they have no conductor.
- A. True
B. False
- 48.** Aircraft systems fit into one of three frequency ranges: VHF, microwave and long-wave.
- A. True
B. False
- 49.** Aviation's earliest navigation systems were long-wave radios and included which of the following?
- A. Non-directional beacon (NDB)
B. Automatic Direction Finder (ADF)
C. Loran
D. All of the above
E. A and B only
- 50.** Examples of shorter-wave VHF radios would include glideslope, localizer and marker beacons.
- A. True
B. False
- 51.** Spheric devices like strike finders and Stormscope operate in the _____ spectrum.
- A. Long wave
B. VHF
C. Satellite
D. Microwave
E. None of the above
- 52.** Some of the more critical considerations in antenna installation include: _____.
- A. Number of antennas, mounting location, separation
B. Size of antenna and frequency range
C. Drag, skin mapping
D. None of the above

Counterfeit Electronic Parts

- 53.** Counterfeit and unapproved parts are exactly the same thing.
- A. True
B. False
- 54.** FAA guidance for PMA parts now permits use of the OEM part number as a root, as long as the prefix or suffix is at least two characters long.
- A. True
B. False

OCTOBER 2012

Frequently Asked Questions - Canada

- 55.** The bilateral agreements between EASA and TCCA; TCCA and FAA; and FAA and EASA allow for what essentially is a trilateral agreement and the approval of all three authorities on one aircraft parts release certificate.
- A. True
B. False

Lightning Detection & Datalink

- 56.** Lightning can strike within _____.
- A. Storm clouds
B. Above or below clouds
C. 10 to 20 miles away from clouds
D. All of the above
- 57.** According to the National Oceanic & Atmospheric Administration, lightning can produce current of 30,000 to 100,000 amperes and _____ volts.
- A. 1,000
B. 10,000
C. 1,000,000
D. 1,000,000,000

- 58.** The odds of being struck by lightning in flight are far greater than being struck while on the ground.
- A. True
B. False
- 59.** Turbulence causes friction, which generates the static-electricity build-up that ultimately discharges as lightning.
- A. True
B. False
- 60.** One additional benefit of spherics devices is their value to pilots _____.
- A. As backup navigational devices
B. In predicting lightning strikes
C. Trying to avoid turbulence even in clear air
D. None of the above
- 61.** Datalink weather systems are generally updated about _____ times per hour.
- A. 1
B. 6
C. 10
D. 60
- 62.** Onboard weather radar or spherics systems are better than uplinked Doppler radar for real-time course changes or tactical decision making in bad weather.
- A. True
B. False

- 63.** A distinct advantage datalink weather offers a pilot over real-time onboard weather radar is _____.
- A. accuracy of data collected by a much more powerful radar
 - B. ability to replay a few hours of data for a storm's trend or track
 - C. latency of onboard weather radar prohibits tactical decision making
 - D. Both A and C
 - E. Both B and C

NOVEMBER 2012

Modernizing Electricals

- 64.** Which of the following stores power for engine starting and acts as a standby source should the power generating source fail?
- A. Alternator
 - B. Circuit breakers
 - C. Battery
 - D. Generator
- 65.** Which of the following controls banks of devices wired to the same circuit and adds over-voltage protection?
- A. Switches
 - B. Circuit breakers
 - C. Battery
 - D. Fuses
- 66.** Which of the following controls the flow of electrical power to individual components, such as nav lights, rotating beacons and landing lights?
- A. Circuit breakers
 - B. Wiring
 - C. Switches
 - D. Annunciators

- 67.** Which of the following applies varying amounts of power to the alternator to meter its output and match system demand?
- A. Generator
 - B. Circuit breaker
 - C. Switch
 - D. Regulator
- 68.** When an aircraft's electrical system can't keep up with the loads imposed on it, some of the deficit is made up by _____.
- A. the alternator
 - B. the standby system
 - C. load shedding
 - D. the battery

- 69.** LED lighting alternatives can draw far less current than the units they replace, sometimes by as much as 70 percent, creating a significant electrical load savings.
- A. True
 - B. False

DECEMBER 2012

International News & Regulatory Updates - Canada

- 70.** In defining performance-based navigation (PBN), a navigation specification that includes a requirement for onboard navigation performance monitoring and alerting is referred to as _____.
- A. GPS/WAAS
 - B. Conventional ILS
 - C. RNAV specification
 - D. RNP specification

- 71.** The highest-performing type of PBN is _____, which benefits users by allowing curved flight paths that optimally navigate within an airspace and between terrain.
- A. RNP 10
 - B. RNP 0.3
 - C. RNP AR
 - D. RNAV
- 72.** PBN removes the reliance on ground-based navigation aids, such as ILS and VOR.
- A. True
 - B. False

ADS-B Circa 2013

- 73.** Every ADS-B ground station across the U.S., Alaska and Hawaii broadcasts these two free services stations.
- A. ATIS and FIS-B
 - B. FIS-B and TIS-B
 - C. TIS-B and ASOS
 - D. ATIS and ASOS
- 74.** Which of the following solutions is required for ADS-B access above flight level 180?
- A. 978 MHz UAT
 - B. 1090ES
 - C. Both A and B
 - D. None of the above
- 75.** If no ADS-B Out aircraft are in range of a ground station, a nearby aircraft with ADS-B In only may not see any traffic.
- A. True
 - B. False

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 2012 back issues of *Avionics News* or go to www.aea.net/avionicsnews 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 www.aea.net/training for information about applying for credit toward the 2012 Avionics Training Excellence Award. This test also can be taken and submitted online at www.aea.net. Or, complete this answer sheet, and then mail it or fax it to *Avionics News* at 816-347-8405.

Important date:

April 1, 2013

Deadline to submit application (with exams) for credit toward the AEA's 2012 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]
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24. [A] [B] [C] [D] [E]
25. [A] [B] [C] [D] [E]

(T) (F)

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