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HQ AFSVA/SVPAR

Annual Instrument Exam

01 August 2019

(Required passing score: 80%)

Exam Instructions:

- 1. Provide your answers on AF Form 1584C (Knowledge Exam Record)***
- 2. References for this test include:***

***FAA-H-8083-15
FAA-H-8083-25
AFH 11-203, volume 1
AC 00-45H, Ch 1
14 CFR Parts 61 and 91
Terminal IAPs, Enroute Charts,
and Terminal Change Notice***

***FLIP General Planning
AFH 11-203, Volumes 1 and 2
Flight Information Handbook
AIM
AFI 34-152***

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Reference: U.S. Terminal Procedures Publications (rate of climb/descent table)

1. The rate of descent on the glide slope is dependent upon:
 - A. true airspeed
 - B. ground speed
 - C. calibrated airspeed

Reference: FAA-H-8083-15

2. What is the first fundamental skill in attitude instrument flying?
 - A. Instrument interpretation
 - B. Aircraft control
 - C. Instrument cross-check

Reference AFH 11-203, vol 1

3. What is the expected duration of an individual microburst?
 - A. One microburst may continue for as long as 2-4 hours.
 - B. Two minutes with maximum winds lasting approximately 1 minute.
 - C. 10 to 20 minutes from the time the burst strikes the ground until dissipation.

Questions 4 and 5 reference AC 00-45H, Ch 1

4. The reporting station originating this Aviation Routine Weather Report has a field elevation of 620 feet. If the reported sky cover is one continuous layer, what is its thickness (tops of OVC are reported at 6,500 feet)?

METAR KMDW 121856Z AUTO 32005KT 1 1/2SM +RA
BR OVC007 17/16 A2980

- A. 5,880 feet
 - B. 5,180 feet
 - C. 5,800 feet
5. The body of a Terminal Aerodrome Forecast (TAF) covers a geographical proximity within a:
 - A. 5 statute mile radius from the center of an airport runway complex.
 - B. 5 nautical mile radius of the center of an airport.
 - C. 5 to 10 statute mile radius from the center of an airport runway complex.

Questions 6 - 7 reference AIM

6. Acceptable navigational signal coverage at the MOCA is assured for a distance from the VOR of only:

- A. 12 NM
- B. 25 NM
- C. 22 NM

7. Which report should be made to ATC without a specific request when not in radar contact?

- A. Entering instrument meteorological conditions.
- B. When leaving final approach fix inbound on final approach.
- C. Correcting an E.T.A. any time a previous E.T.A. is in error in excess of 2 minutes.

Questions 8 - 10 reference 14 CFR Part 91

8. If a pilot elects to proceed to the selected alternate, the landing minimums used at that airport should be the:

- A. Minimums specified for the approach procedure selected.
- B. Alternate minimums shown on the approach chart.
- C. Minimums shown for that airport in a separate listing of "IFR Alternate Minimums".

9. What minimum weather conditions must be forecast for your ETA at an alternate airport, that has only a VOR approach with standard alternate minimums, for the airport to be listed as an alternate on the IFR flight plan?

- A. 800-foot ceiling and 2 statute miles visibility.
- B. 600-foot ceiling and 2 statute miles visibility.
- C. 1000-foot ceiling and visibility to allow descent from minimum enroute altitude (MEA), approach, and landing under basic VFR.

10. For aircraft other than helicopters, is an alternate airport required for an IFR flight to ATL (Atlanta Hartsfield) if the proposed ETA is 1930Z?

TAF KATL 121720Z 121818 20012KT 5SM HZ BKN030
 FM2000 3SM TSRA OVC025CB
 FM2200 33015G20KT P6SM BKN015 OVC040 BECMG
 0608 02008KT BKN040 BECMG 1012 00000KT P6SM
 CLR=

- A. Yes, because the ceiling could fall below 2,000 feet within 2 hours before to 2 hours after the ETA.
- B. No, because the ceiling and visibility are forecast to remain at or above 1,000 feet and 3 miles, respectively.
- C. No, because the ceiling and visibility are forecast to be at or above 2,000 feet and 3 miles within 1 hour before to 1 hour after the ETA.

Questions 11 – 14 reference FLIP General Planning

11. A portion of your ATC clearance received prior to takeoff included the phrase "cleared as filed." This phrase implies:
- A. Clearance to fly as filed except for minor departure changes.
 - B. Both the route and altitude filed are identical to the ATC cleared route and altitude.
 - C. Cleared to proceed in accordance with the route of flight filed in the flight plan. This clearance does not include the altitude, DP, or DP transition.
 - D. The filed SID is cancelled, but the filed route and altitude are approved.
12. While executing a SID, you are RADAR vectored off the depicted track. You should:
- A. Expect to resume the SID as soon as traffic permits.
 - B. Not accept the vector since ATC can't vector you off the SID once you are cleared for it.
 - C. Consider the SID cancelled.
 - D. Both A and C.
13. An immediate deviation from an approved route is necessary because of thunderstorm conditions. You:
- A. Must request approval to deviate and indicate the extent of the detour.
 - B. May exercise your emergency authority to immediately deviate without clearance if thunderstorm conditions are of such severity that time does not permit ATC approval.
 - C. Must request emergency authority to reroute the flight and provide the proposed route to ATC.
 - D. Record the details and retain them for a minimum of 30 days.
14. On arrival at a clearance limit fix, without further clearance and without holding instructions, you should request further clearance and:
- A. Hold in a standard holding pattern on the course on which the aircraft approached the fix (if no holding pattern is charted).
 - B. Hold in the charted holding pattern at the clearance limit fix.
 - C. Continue the filed route of flight while awaiting clearance.
 - D. Either A or B.

Questions 15 – 17 reference *Flight Information Handbook*

15. Within the NAS, when informed that aircraft are in “RADAR CONTACT,” which additional report(s) should be made to ATC or FSS facilities without a specific ATC request?
- When leaving any assigned holding fix or point.
 - When leaving final approach fix inbound on final approach (nonprecision approach) or when leaving the outer marker or fix used in lieu of the outer marker inbound on final approach (precision approach).
 - When an approach has been missed.
 - Both A and C.
- 16 You are expected to monitor ATIS, where available, to obtain essential routine terminal information. If the ATIS broadcast does not mention sky condition or visibility, the minimum ceiling and visibility existing at the terminal:
- Is being broadcast continuously over the local VOR station.
 - Is at least a 5,000 foot ceiling with 5 miles or more visibility.
 - Is changing rapidly and will be broadcast at a later time.
 - Cannot be determined from this broadcast.
17. What does the following METAR observation tell you?
- EDAD 0401Z 25007KT 8000 -RA BR SCT008 BKN010 BKN022 BKN040
09/08 A3026 RMK WR// GRN
- The ceiling is 1000 feet.
 - The RVR is 8000 feet.
 - Visibility is restricted by light rain and mist.
 - Both A and C.

Questions 18 – 19 reference *Terminal IAPs, Enroute Charts, and Terminal Change Notice*

18. On Enroute Low Altitude - US Charts, airfields shown in brown:
- Use an LF/MF NAVAID for the published IAP.
 - Have other than a hard-surfaced runway.
 - Do not have a control tower.
 - Do not have a published IAP.
19. What kind of altitude is indicated by the following symbol: $\overline{4600}$?
- A maximum altitude.
 - A mandatory altitude.
 - A minimum sector altitude.
 - An emergency safe altitude.

Reference AFH 11-203, Volume 1 – Weather for Aircrews

20. Which procedure must be used to avoid or minimize the effects of aircraft icing?
- A. Use anti-ice and de-ice equipment.
 - B. Avoid clouds when the temperature is between 0°C and -20°C.
 - C. If icing is encountered, climb or descend to an altitude where the temperature is warmer than 0°C or colder than -20°C.
 - D. All of the above.

Reference AFH 11-203, Volume 2 – Weather for Aircrews

21. Which statement is correct concerning the following METAR report?

KRND 202356Z 34008KT 2SM -RA BR SCT005 BKN010 OVC040 14/13 A2998 RMK SLP126

- A. The ceiling is 500 feet AGL.
- B. The ceiling is 1,000 feet AGL.
- C. Runway 12 visual range is 600 meters.
- D. The sky is totally obscured.

Questions 22 - 26 reference the FAR/AIM

22. To meet the minimum required instrument flight experience to act as pilot-in-command of an aircraft under IFR, you must have logged within the 6 calendar months preceding the month of the flight, in the same category of aircraft:

- A. And 6 hours of instrument time in any aircraft and 6 instrument approaches
- B. Holding procedures, intercepting and tracking courses through the use of navigation systems and 6 instrument approaches.
- C. Six instrument approaches, three of which must be in the same category and class of aircraft to be flown, and 6 hours of instrument time in any aircraft.

23. What is the floor of Class E airspace when designated in conjunction with an airport which has an approved IAP?

- A. 500 feet AGL.
- B. 700 feet AGL.
- C. 1,200 feet AGL.

24. What record shall be made in the aircraft log or other permanent record by the pilot making the VOR operational check?

- A. The date, place, bearing error, and signature.
- B. The date, frequency of VOR or VOT, number of flight hours since last check, and signature.
- C. The date, place, satisfactory or unsatisfactory, and signature.

25. What are the minimum qualifications for a person who occupies the other seat as safety pilot during simulated instrument flight?
- A. Private pilot certificate with appropriate category, class, and an instrument rating.
 - B. Private pilot certificate with an instrument rating.
 - C. Private pilot certificate with appropriate category and class ratings for the aircraft being flown.
26. When making an instrument approach at the selected alternate airport, what landing minimums apply?
- A. Standard alternate minimums (600-2 or 800-2).
 - B. The IFR alternate minimums listed for that airport.
 - C. The landing minimums published for the type of procedure selected.

**Questions 27 – 31 reference AC 00-45H, CH 1, FAA-H-8083-25, or
AFH 11-203, VOL 1**

27. Clouds, fog, or dew will always form when:
- A. Air reaches the complete saturation point.
 - B. Water vapor is present.
 - C. The temperature and dew point are equal.
28. Why is frost considered hazardous to flight operations?
- A. Frost changes the basic aerodynamic shape of the airfoil.
 - B. Frost decreases control effectiveness.
 - C. Frost causes early airflow separation resulting in a loss of lift.
29. The pressure altitude at a given location is indicated on the altimeter after the altimeter is set to:
- A. The field elevation.
 - B. 29.92" Hg
 - C. The current altimeter setting.
30. Supercooled large drops (SLD) as defined in Current Icing Product (CIP) and Forecast Icing Product (FIP) are:
- A. Super cooled water droplets larger than 50 micrometers in diameter and freezing drizzle and/or freezing rain.
 - B. Listed in CIP and FIP at the heavy intensity level.
 - C. Both A and B.

31. What information is provided by a Convective Outlook (AC)?
- A. It describes areas of probable severe icing and severe or extreme turbulence during the next 24 hours.
 - B. It provides prospects of both general and severe thunderstorm activity during the next 24/48/72 hours. (days 1,2 and 3)
 - C. It indicates areas of probable convective turbulence and the extent of instability in the upper atmosphere (above 500 MB).

Questions 32 and 33 reference FAA-H-8083-15

32. What pre-takeoff check should be made of the attitude indicator in preparation for an IFR flight?
- A. The horizon bar does not vibrate during warm-up.
 - B. The miniature airplane should erect and become stable within 5 minutes.
 - C. The horizon bar should erect and become stable within 5 minutes.
33. When using the VOR for navigation, which of the following should be considered as station passage?
- A. The first movement of the CDI as the airplane enters the zone of confusion.
 - B. The moment the TO / FROM indicator becomes blank.
 - C. The first positive, complete reversal of the TO / FROM indicator.

Questions 34 and 35 reference the AIM

34. When being radar vectored for an ILS approach, at what point may you start a descent from your last assigned altitude to a lower minimum altitude if cleared for the approach?
- A. When established on a segment of a published route or IAP.
 - B. You may descend immediately to published glide slope interception altitude.
 - C. Only after you are established on the final approach unless informed otherwise by ATC.
35. A pilot is making an ILS approach and is past the OM to a runway which has a VASI. What action should the pilot take if an electronic glide slope malfunction occurs and the pilot has the VASI in sight?
- A. The pilot should inform ATC of the malfunction and then descend immediately to the localizer DH and make a localizer approach.
 - B. The pilot may continue the approach and use the VASI glide slope in place of the electronic glide slope.
 - C. The pilot must request a LOC approach, and may descend below the VASI at the pilot's discretion.

Questions 36 and 37 reference AFI 34-152

36. You just received your instrument, including logging 10 hours of actual instrument time. You are planning an IFR flight in an Aero Club aircraft. Your departure airport weather at your planned takeoff time forecasts an 800 foot ceiling and two miles visibility. Looking at the approach plates for your departure airport, you notice the lowest compatible straight-in approach minimums as 500 / 1 (MDA / Visibility) and the lowest compatible circling minimums as 1000 / 2. Your planned departure runway does not list non-standard takeoff minimums nor does it have a published departure procedure. May you legally takeoff if the actual conditions are as forecast?

- A. Yes, the weather is greater than my lowest straight-in minimums.
- B. No, the weather is less than my lowest circling minimums.
- C. Yes, because I am operating under 14 CFR Part 91, and there are no published departure procedures.

37. You are away from the airport where the Aero Club is located. Weather comes into the field you are at and is now below VFR minimums, but above Special VFR minimums. As a private pilot (non-instrument rated), can you request a Special VFR clearance and depart on your flight back to your home station?

- A. Yes, as long as it is daytime and the aircraft is equipped for instrument flight.
- B. No. An Aero Club Private Pilot (non-instrument rated) is not authorized flight under special VFR.
- C. Yes, as long as you received IFR training during your Private Pilot certification and the aircraft is equipped for IFR flight.

Questions 38 – 49 reference the AIM

38. What are T-routes?

- A. T-routes or Tango Routes are routes that pass through selected “restricted airspaces”, therefore requiring special authorization and training to fly them.
- B. T-routes are not applicable to fixed wing aircraft they are only for rotorcraft usage.
- C. T-routes are no longer available since the retirement of the LORAN navigation system.
- D. T-routes are available for use by GPS or GPS/WAAS equipped aircraft from 1,200 feet above the surface (or in some instances higher) up to but not including 18,000 feet MSL. T-routes are depicted on Enroute Low Altitude Charts.

39. With a WAAS enabled GPS, what distance off-course is represented by a full scale deflection of the CDI when in approach mode on the final approach segment?

- A. 0.3 nm
- B. 1.0 nm
- C. 5.0 nm

40. When flying a VOR approach in a GPS equipped aircraft, can you use the GPS to navigate the final approach segment?

- A. Yes, as long as the VOR course is also monitored.
- B. Yes, but only if the approach is named VOR-A
- C. No, the approach must be navigated using the VOR

41. A pilot is filing an IFR flight plan with both the destination airport and the alternate airport having GPS RNAV approaches only. The alternate airport has an LPV approach and standard alternate minimums. The TAF for the alternate for the estimated time of arrival is indicating BKN007 2SM. The aircraft is equipped with a WAAS receiver (TSO-C145/TSO-C146). Is the pilot allowed to file this IFR flight plan?

- A. No, because both the destination airport and the alternate have GPS RNAV approaches only, and either your destination airport or your alternate must have an approved instrument approach procedure other than GPS.
- B. Yes, because the aircraft is equipped with WAAS, and your alternate airport has an LPV approach, so precision alternate weather minimums (600-2) apply.
- C. No, because WAAS users are prohibited from planning to use LPV at their alternate airport and must plan an LNAV approach using non-precision alternate weather minimums (800-2).

42. If the GPS approach mode is not armed by 2 NM prior to the FAWP, the approach mode will not become active at 2 NM prior to the FAWP, and the equipment will flag. In these conditions, the RAIM and CDI sensitivity will not ramp down, and the pilot should:


- A. Fly to the MAWP and execute the missed approach.
- B. Not descend to the MDA.
- C. Attempt to arm the system.
- D. Both A and B.

43. Preflight action concerning IFR use of GPS includes:

- A. Determine the date of database issuance, and verify that the date/time of proposed use is before the expiration date/time.
- B. Verify that the database provider has not published a notice limiting the use of the specific waypoint or procedure.
- C. Ensure the aircraft is continuously within VOR reception range.
- D. Both A and B.

44. A GPS missed approach requires:

- A. Nothing, the GPS will automatically sequence to the missed approach segment.
- B. Pilot action to sequence the receiver past the MAWP to the missed approach segment of the approach.
- C. Activation before reaching the MAWP.

45. During IFR enroute and terminal operations using an approved GPS system for navigation, ground based navigational facilities:
- A. Are only required during the approach portion of the flight.
 - B. must be operational along the entire route.
 - C. Must be operations only if RAIM predicts an outage.
46. The GPS/LPV approach can be accepted by a CFII for conducting and IPC or by an evaluator/examiner to satisfy the demonstration of a precision approach.
- A. True
 - B. False
47. The  symbol annotated on an approach chart informs the pilot that:
- A. A WAAS capable receiver is required to execute this approach.
 - B. Vertical guidance outages may occur daily at this location.
 - C. Lateral guidance outages may occur daily at this location.
48. A critical component of Required Navigation Performance (RNP) is:
- A. The ability of the aircraft to navigation system to monitor its achieved navigation performance.
 - B. Variable depending on the navigation structure.
 - C. To identify for the pilot whether the operational requirement is, or is not being met.
 - D. Both A and C.
49. The onboard navigation database must be _____ and _____ for the region of intended operation.
- A. Current; appropriate
 - B. Coded; confirmed
 - C. Appropriate: coded
50. You are cleared to an IAF associated with the Terminal Arrival Area (TAA). ATC expects you to:
- A. Proceed to the IAF, descending to the altitude associated with the FAF.
 - B. Proceed to the IAF, maintaining your current altitude until passing the IAF to which you are cleared.
 - C. Proceed to the IAF and maintain the altitude depicted for that area unless cleared otherwise.

USAF AERO CLUB KNOWLEDGE EXAM RECORD

Name: _____ Date Taken: _____

Type Exam: Standardization Instrument Make & Model _____ Recurrency
 Initial Solo Solo Cross Country Other: _____

Raw Score (%): _____ Date Corrected to 100%: _____

I certify all items were thoroughly debriefed and all questions answered

Pilot's Signature

Instructor's Signature

Pilot's Signature					Instructor's Signature						
T	F				T	F					
1.	(A)	(B)	(C)	(D)		26.	(A)	(B)	(C)	(D)	
2.	(A)	(B)	(C)	(D)		27.	(A)	(B)	(C)	(D)	
3.	(A)	(B)	(C)	(D)		28.	(A)	(B)	(C)	(D)	
4.	(A)	(B)	(C)	(D)		29.	(A)	(B)	(C)	(D)	
5.	(A)	(B)	(C)	(D)		30.	(A)	(B)	(C)	(D)	
6.	(A)	(B)	(C)	(D)		31.	(A)	(B)	(C)	(D)	
7.	(A)	(B)	(C)	(D)		32.	(A)	(B)	(C)	(D)	
8.	(A)	(B)	(C)	(D)		33.	(A)	(B)	(C)	(D)	
9.	(A)	(B)	(C)	(D)		34.	(A)	(B)	(C)	(D)	
10.	(A)	(B)	(C)	(D)		35.	(A)	(B)	(C)	(D)	
11.	(A)	(B)	(C)	(D)		36.	(A)	(B)	(C)	(D)	
12.	(A)	(B)	(C)	(D)		37.	(A)	(B)	(C)	(D)	
13.	(A)	(B)	(C)	(D)		38.	(A)	(B)	(C)	(D)	
14.	(A)	(B)	(C)	(D)		39.	(A)	(B)	(C)	(D)	
15.	(A)	(B)	(C)	(D)		40.	(A)	(B)	(C)	(D)	
16.	(A)	(B)	(C)	(D)		41.	(A)	(B)	(C)	(D)	
17.	(A)	(B)	(C)	(D)		42.	(A)	(B)	(C)	(D)	
18.	(A)	(B)	(C)	(D)		43.	(A)	(B)	(C)	(D)	
19.	(A)	(B)	(C)	(D)		44.	(A)	(B)	(C)	(D)	
20.	(A)	(B)	(C)	(D)		45.	(A)	(B)	(C)	(D)	
21.	(A)	(B)	(C)	(D)		46.	(A)	(B)	(C)	(D)	
22.	(A)	(B)	(C)	(D)		47.	(A)	(B)	(C)	(D)	
23.	(A)	(B)	(C)	(D)		48.	(A)	(B)	(C)	(D)	
24.	(A)	(B)	(C)	(D)		49.	(A)	(B)	(C)	(D)	
25.	(A)	(B)	(C)	(D)		50.	(A)	(B)	(C)	(D)	