

PRACTICE EXAM 20

1. Under the post-MOSAIC rule, a Sport Pilot may fly a four-seat aircraft but is still limited to carrying:
 - A. Three passengers in daytime VFR
 - B. Two passengers if expenses are shared
 - C. Passengers equal to the number of seats
 - D. One passenger only

2. The dual ignition system keeps the engine running after a total electrical failure because the magnetos are:
 - A. Powered by the aircraft battery
 - B. Driven by the alternator output
 - C. Energized by the avionics master switch
 - D. Engine-driven and self-contained

3. A wing in a 60° banked level turn experiences a load factor of about 2 G, which causes the stall speed to:
 - A. Decrease compared to level flight
 - B. Remain unchanged from level flight
 - C. Increase compared to level flight
 - D. Drop to zero during the turn

4. A vacuum system failure leaves which instrument still operating normally?
 - A. The attitude indicator

- B. The heading indicator
- C. The turn coordinator
- D. Both gyroscopic flight instruments

5. A density altitude computed at 7,000 feet on a hot day at a 3,000-foot field means the airplane will perform as though at:

- A. Sea level on a standard day
- B. 3,000 feet, equal to the field elevation
- C. 1,000 feet, below the field elevation
- D. A higher altitude than the field elevation

6. A small, falling temperature/dewpoint spread at the destination most strongly suggests:

- A. Clearing skies and improving visibility
- B. Fog or low clouds forming, reducing visibility
- C. A rapid rise in surface pressure
- D. Strong, gusty winds developing

7. On a color-coded chart, an airport shaded red (IFR) is, for a day-VFR Sport Pilot:

- A. A preferred destination with good conditions
- B. Suitable with an instrument climb
- C. A no-go condition requiring reassessment
- D. Unrelated to the planned VFR flight

8. A Sport Pilot wishing to enter Class C airspace must hold:

- A. A first class medical certificate

- B. The appropriate instructor endorsement
- C. A commercial pilot certificate
- D. A one-time waiver from the tower

9. A true heading of 270° in an area of 10°W variation gives a magnetic heading of:

- A. 280°
- B. 270°
- C. 260°
- D. 290°

10. The single most important action to recover from any stall is to:

- A. Add full power and hold the nose up
- B. Reduce the angle of attack by lowering the nose
- C. Apply full opposite rudder immediately
- D. Bank steeply away from the stalled wing

11. Carburetor ice forms most readily in conditions that are:

- A. Cold and dry, well below freezing
- B. Warm and humid, even above freezing
- C. Hot and dry with very low humidity
- D. Only in visible precipitation at altitude

12. An overdue, applicable Airworthiness Directive renders the aircraft:

- A. Unairworthy and prohibited from operation

- B. Airworthy if flown only for personal use
- C. Legal to fly with a placard installed
- D. Subject only to a recommended inspection

13. A microburst encountered on short final is most appropriately handled by:

- A. Reducing power to descend onto the runway
- B. Maintaining the approach and accepting the sink
- C. Lowering the nose to increase the descent
- D. Applying maximum power and going around

14. The day-VFR fuel reserve requires enough fuel to reach the destination plus:

- A. 1 hour at normal cruise
- B. 45 minutes at normal cruise
- C. No reserve, for short flights
- D. 30 minutes at normal cruise

15. A ceiling reported in a METAR is the lowest layer reported as:

- A. Few or scattered clouds
- B. Clear below 12,000 feet
- C. Broken or overcast
- D. The first layer encountered

16. A pilot who catches the thought "I've flown in worse than this" before a marginal flight is exhibiting which hazardous attitude?

- A. Anti-authority, countered by "Follow the rules"

- B. Resignation, countered by "I can make a difference"
- C. Macho, countered by "Taking chances is foolish"
- D. Impulsivity, countered by "Think first"

17. Useful load is calculated as:

- A. Maximum weight minus empty weight
- B. Total moment divided by total weight
- C. Empty weight plus the baggage
- D. The arm multiplied by the weight

18. A standard left-hand traffic pattern is joined at a non-towered airport by:

- A. A straight-in approach to final
- B. A 45-degree entry to the downwind at pattern altitude
- C. An overhead break over the runway
- D. A direct base entry against traffic

19. The airspeed indicator is the only pitot-static instrument connected to the:

- A. Pitot tube
- B. Static port alone
- C. Vacuum pump
- D. Alternator output

20. A cold front is associated with which weather sequence?

- A. Gradual, widespread layered clouds and steady rain

- B. Days of unchanging, calm weather
- C. A narrow band of intense weather, then rapid clearing
- D. Slowly improving visibility over many hours

21. A pilot using a U.S. driver's license for medical eligibility is disqualified if the pilot's most recent FAA medical was:

- A. Issued more than 24 months ago
- B. Denied, suspended, or revoked
- C. A third class rather than first class
- D. Used for a flight review

22. The propeller's blade twist exists primarily to:

- A. Reduce the propeller's total weight
- B. Equalize the angle of attack from root to tip
- C. Allow the blades to be feathered in cruise
- D. Increase parasite drag at the tips

23. A Prohibited Area, marked "P" on a sectional, means:

- A. Entry is allowed with controller permission
- B. Caution is advised because status is unknown
- C. Flight is prohibited entirely
- D. Military training requiring extreme caution

24. As density altitude increases, takeoff distance and rate of climb:

- A. Both improve together

- B. Distance increases and climb rate decreases
- C. Distance decreases and climb rate increases
- D. Both remain unchanged

25. A high-pressure system is generally associated with:

- A. Rising air and widespread precipitation
- B. Severe turbulence and frequent windshear
- C. Towering cumulus and thunderstorms
- D. Sinking, stable air and fair weather

26. The ARROW acronym lists the documents that must be:

- A. Memorized for the knowledge test only
- B. Carried by the pilot at all times
- C. Filed with the FAA before each flight
- D. Aboard the aircraft for legal flight

27. An aft center of gravity, compared to a properly loaded airplane, is more hazardous because it:

- A. Reduces stability and degrades stall recovery
- B. Lowers the stall speed substantially
- C. Increases elevator forces and stability
- D. Has no effect on controllability

28. A pilot encountering an aircraft motionless in the windscreen but slowly growing larger should:

- A. Maneuver early, recognizing a collision course

- B. Continue straight, since it poses no threat
- C. Wait to confirm the other aircraft's intentions
- D. Squawk 7700 and take no evasive action

29. The minimum flight visibility under standard Sport Pilot privileges, regardless of airspace, is:

- A. 1 statute mile, clear of clouds
- B. 3 statute miles, with visual surface reference
- C. 5 statute miles in all conditions
- D. 1/2 statute mile below 1,200 feet AGL

30. Structural icing requires which two conditions together?

- A. Clear skies and freezing temperatures
- B. Visible moisture and temperatures at or below freezing
- C. High humidity and temperatures above 20°C
- D. Strong winds and a high-pressure system

31. The magnetic compass acceleration error, summarized as ANDS, means on an easterly or westerly heading the compass:

- A. Lags when turning to the north
- B. Reads correctly during all accelerations
- C. Shows a turn toward north when accelerating
- D. Freezes during any speed change

32. A pilot loses the alternator in cruise. The correct response, since the engine keeps running, is to:

- A. Shut down the engine to conserve the battery

- B. Increase RPM to force the battery to charge
- C. Shed nonessential electrical load to preserve the battery
- D. Turn on all equipment to test the system

33. A VOR must always be confirmed before use by its:

- A. Color on the cockpit indicator
- B. Position on the GPS moving map
- C. Listed frequency in the legend
- D. Morse code identifier

34. Flaps increase both lift and drag, which on approach allows:

- A. A slower, steeper approach without gaining speed
- B. A higher maximum cruise speed
- C. A reduction in the airplane's total drag
- D. An increase in the never-exceed speed

35. A briefer states "VFR flight not recommended." For a day-VFR Sport Pilot, this should:

- A. Be disregarded, since it is advisory
- B. Prompt an immediate departure to beat the weather
- C. Authorize an instrument climb above the weather
- D. Weigh heavily toward delaying or canceling

36. A 100-hour inspection is required for an aircraft that is:

- A. Flown only for personal recreation

- B. Equipped with a controllable-pitch propeller
- C. Operated for hire or used for paid instruction
- D. Registered to more than one owner

37. A pilot must hold which medical eligibility to fly at night under MOSAIC privileges?

- A. BasicMed or at least a third class medical certificate
- B. A valid U.S. driver's license alone
- C. A first class medical within six months
- D. No medical, since night is now standard

38. Total drag on an airplane is lowest, and efficiency highest, where:

- A. Induced and parasite drag are roughly balanced
- B. Parasite drag is at its maximum
- C. Induced drag alone is at its peak
- D. The airplane is at the never-exceed speed

39. A pilot computes a 120-nautical-mile leg at a groundspeed of 80 knots. The time en route is:

- A. 60 minutes
- B. 45 minutes
- C. 120 minutes
- D. 90 minutes

40. The careless or reckless operation rule applies:

- A. Broadly, against endangering others' life or property

- B. Only within controlled airspace near airports
- C. Only to flights conducted for compensation
- D. Only after an actual accident has occurred

ANSWER KEY WITH EXPLANATIONS

1. D — One passenger only. The single-passenger limit is absolute, even in a four-seat aircraft under MOSAIC. No condition or endorsement lifts it.

2. D — Engine-driven and self-contained. The magnetos generate their own spark as the engine turns them, independent of the battery and alternator. This is why the engine runs after a total electrical failure.

3. C — Increase compared to level flight. A 2 G load factor in a 60° bank raises the airspeed at which the wing reaches its critical angle, increasing stall speed. The critical angle itself is unchanged.

4. C — The turn coordinator. The electric turn coordinator keeps working when a vacuum failure disables the attitude and heading indicators. This complementary power split aids partial-panel flight.

5. D — A higher altitude than the field elevation. A density altitude of 7,000 feet at a 3,000-foot field means the airplane performs as though much higher, degrading performance. Hot, high conditions raise density altitude well above field elevation.

6. B — Fog or low clouds forming, reducing visibility. A small, falling temperature/dewpoint spread signals air nearing saturation, so fog or low clouds are likely. This warns of reduced visibility.

7. C — A no-go condition requiring reassessment. Red shading marks IFR conditions, which are no-go for day VFR, so the pilot must reassess. A Sport Pilot cannot legally or safely climb on instruments.

8. B — The appropriate instructor endorsement. A Sport Pilot needs the appropriate airspace endorsement to enter Class C; no medical upgrade, commercial certificate, or waiver substitutes. The endorsement must be obtained first.

9. A — 280° . With 10°W variation, magnetic heading is $270 + 10 = 280^\circ$ ("west is best"). Westerly variation is added to true heading.
10. B — Reduce the angle of attack by lowering the nose. Every stall is cured by reducing the angle of attack, accomplished by lowering the nose. Pulling back deepens the stall.
11. B — Warm and humid, even above freezing. Carburetor ice forms most readily in warm, humid air because the carburetor's internal temperature drop reaches freezing even when outside air is above it. This counterintuitive fact is heavily tested.
12. A — Unairworthy and prohibited from operation. An overdue applicable AD renders the aircraft unairworthy until corrected; compliance is mandatory regardless of use. No placard makes it legal.
13. D — Applying maximum power and going around. A microburst on short final calls for maximum power and an immediate go-around, since the shear can exceed the airplane's capability. Reducing power or accepting the sink is dangerous.
14. D — 30 minutes at normal cruise. Day-VFR rules require fuel to reach the destination plus a 30-minute reserve. This applies even to short flights.
15. C — Broken or overcast. A ceiling is the lowest layer reported as broken or overcast; few and scattered layers do not count. Ceiling and visibility determine VFR legality.
16. C — Macho, countered by "Taking chances is foolish." "I've flown in worse" reflects the macho attitude, countered by "Taking chances is foolish." Recognizing the thought is the protective step.
17. A — Maximum weight minus empty weight. Useful load is the maximum weight minus the empty weight, representing capacity for occupants, fuel, and baggage. It is not a moment or arm calculation.
18. B — A 45-degree entry to the downwind at pattern altitude. The recommended non-towered pattern entry is a 45-degree intercept to the downwind at pattern altitude. Straight-ins and overhead breaks are not the standard entry.

19. A — Pitot tube. The airspeed indicator is the only pitot-static instrument connected to the pitot tube, measuring ram versus static pressure. The altimeter and VSI use static pressure only.
20. C — A narrow band of intense weather, then rapid clearing. A cold front brings brief but violent weather followed by clearing. A warm front brings widespread, prolonged poor weather.
21. B — Denied, suspended, or revoked. A denied, suspended, or revoked FAA medical disqualifies a pilot from the driver's-license provision until resolved. The certificate class or age of issuance is not the disqualifier.
22. B — Equalize the angle of attack from root to tip. The propeller's twist compensates for the tip moving faster than the root, equalizing the angle of attack along the blade. It is not for weight, feathering, or drag.
23. C — Flight is prohibited entirely. A Prohibited Area ("P") bars flight entirely for security or national welfare. Restricted and Warning areas have different, less absolute rules.
24. B — Distance increases and climb rate decreases. Higher density altitude lengthens takeoff distance and reduces climb rate by thinning the air. Takeoff is the most dangerous phase.
25. D — Sinking, stable air and fair weather. High pressure features descending, stable air that suppresses clouds and brings fair weather. Lows, with rising air, bring poor weather.
26. D — Aboard the aircraft for legal flight. ARROW lists the documents that must be aboard the aircraft: Airworthiness certificate, Registration, Radio license (international), Operating limitations, and Weight and balance. They are not pilot-carried or pre-filed.
27. A — Reduces stability and degrades stall recovery. An aft CG reduces longitudinal stability and worsens stall recovery, making it the more dangerous extreme. A forward CG increases stability and control forces.

28. A — Maneuver early, recognizing a collision course. A target that stays in the same windscreen position and grows larger is on a collision course, so the pilot maneuvers early. Waiting removes precious time.

29. B — 3 statute miles, with visual surface reference. A Sport Pilot must always have at least 3 statute miles visibility and visual reference to the surface, regardless of airspace. This reflects the day-VFR nature of the certificate.

30. B — Visible moisture and temperatures at or below freezing. Structural icing requires both visible moisture and a temperature at or below freezing together. Either alone will not produce airframe ice.

31. C — Shows a turn toward north when accelerating. ANDS means on easterly/westerly headings, accelerating shows a turn toward north and decelerating toward south. The error is momentary, during the speed change.

32. C — Shed nonessential electrical load to preserve the battery. Losing the alternator, the pilot sheds nonessential load to preserve the battery, since the engine runs on the magnetos. Shutting down the engine is unnecessary.

33. D — Morse code identifier. A VOR must be confirmed by its Morse code identifier before use; an absent or wrong identifier means it is unreliable. Color and frequency alone do not verify it.

34. A — A slower, steeper approach without gaining speed. Flaps add both lift and drag, allowing a slower, steeper approach without the airplane gaining speed. They do not raise cruise or never-exceed speed.

35. D — Weigh heavily toward delaying or canceling. "VFR flight not recommended" is the briefer's judgment that conditions are hazardous, weighing heavily toward delay or cancellation for a day-VFR pilot. The decision is the PIC's, but the conservative choice is wisest.

36. C — Operated for hire or used for paid instruction. The 100-hour inspection applies only to aircraft flown for hire or used for paid instruction; purely personal aircraft need only the annual. This is a frequently tested distinction.

37. A — BasicMed or at least a third class medical certificate. MOSAIC night flight requires BasicMed or a third class medical, plus training and an endorsement; the driver's-license provision is insufficient. Night is not a standard Sport Pilot privilege.

38. A — Induced and parasite drag are roughly balanced. Total drag is minimized—and the best lift-to-drag ratio achieved—where induced drag (high at low speed) and parasite drag (high at high speed) are balanced. This is the most efficient airspeed.

39. D — 90 minutes. Time equals distance divided by groundspeed: $120 \div 80 = 1.5 \text{ hr} = 90 \text{ minutes}$. Groundspeed drives trip time.

40. A — Broadly, against endangering others' life or property. The careless-or-reckless rule is a broad catch-all prohibiting operation that endangers others, regardless of airspace, purpose, or whether an accident occurred. It is the FAA's general safety net.