

PRACTICE EXAM 24

1. A Sport Pilot holds the required night endorsement and a third class medical, but the most recent FAA medical was later revoked. For day VFR using the driver's-license provision, the pilot is:

- A. Eligible, because the night endorsement is separate
- B. Eligible, because a third class medical was once held
- C. Ineligible, because a revoked FAA medical disqualifies that provision
- D. Eligible only when flying at night

2. Under MOSAIC, a Sport Pilot may fly a four-seat, retractable-gear airplane with a controllable-pitch propeller, provided the pilot has the proper endorsements and the aircraft's clean stall speed does not exceed:

- A. 45 knots calibrated airspeed
- B. 59 knots calibrated airspeed
- C. 87 knots calibrated airspeed
- D. 120 knots calibrated airspeed

3. An airplane in a coordinated 45° banked level turn experiences a load factor of about 1.4 G. Compared with a 60° bank, the stall-speed increase at 45° is:

- A. Greater than at 60° bank
- B. Identical to that at 60° bank
- C. Exactly double that at 60° bank
- D. Less than at 60° bank

4. A pilot notes the temperature/dewpoint spread is 1°C and falling, the wind is calm, and dusk is approaching. The combination most strongly suggests:

- A. Improving visibility through the evening
- B. Strong convective turbulence overnight
- C. A rapid rise in surface pressure
- D. Radiation fog forming near the surface

5. During cruise on a humid day, RPM slowly decreases with no throttle movement; applying carburetor heat first causes a further small RPM drop, then a rise. This sequence confirms:

- A. Carburetor ice was present and is now clearing
- B. A failing magneto on one side
- C. An alternator overcharge condition
- D. The mixture is set too lean for the altitude

6. A pilot flies a true course of 090° with the wind reported from 090° at 20 knots and a true airspeed of 100 knots. The wind is, relative to the course:

- A. A direct headwind, reducing groundspeed with no crab required
- B. A direct crosswind from the right requiring a crab
- C. A direct tailwind increasing groundspeed
- D. A quartering tailwind from the left

7. Which sequence correctly orders the conversions from true course to compass heading?

- A. True course, wind, variation, deviation
- B. True course, deviation, variation, wind
- C. True course, variation, deviation, wind
- D. True course, variation, wind, deviation

8. A METAR reads "...09015G28KT 1/2SM FG OVC003...". For a day-VFR Sport Pilot, these conditions are:

- A. Below VFR minimums and a clear no-go
- B. Marginal but legal for day VFR
- C. Acceptable with an instrument climb
- D. Suitable once the gusts subside

9. An aft CG and an excessively forward CG both create hazards. Compared to the forward CG, the aft CG specifically:

- A. Increases stick force and stability
- B. Reduces stability and worsens stall recovery
- C. Raises the stall speed substantially
- D. Has no effect on stall recovery

10. A pilot reads "2049 (1232)" beside an obstruction along a route planned at 2,000 feet MSL. The correct interpretation and action is:

- A. The obstacle is 1,232 feet MSL, so 2,000 feet clears it
- B. The obstacle is below the route and can be ignored
- C. The numbers are a frequency, not an elevation
- D. The obstacle tops 2,049 feet MSL, so a higher altitude is needed

11. A pilot catches the thought "regulations are overly cautious; I'll do it my way." This hazardous attitude and its antidote are:

- A. Impulsivity; "Not so fast. Think first."
- B. Anti-authority; "Follow the rules. They are usually right."
- C. Resignation; "I'm not helpless."

D. Invulnerability; "It could happen to me."

12. A vacuum pump fails in day VFR. The pilot retains reliable indications from the:

- A. Attitude indicator and heading indicator
- B. Turn coordinator, airspeed indicator, and altimeter
- C. Heading indicator alone
- D. Attitude indicator alone

13. Considering both the regulation and the aerodynamics, why must a Sport Pilot avoid cloud penetration?

- A. The pilot lacks instrument training and the inner ear induces spatial disorientation
- B. The magnetic compass ceases to function entirely in cloud
- C. Clouds always contain structural icing at every temperature
- D. ATC forbids any flight within 10 miles of clouds

14. A pilot computes that a 90-NM leg at a groundspeed of 120 knots, burning 6 gph, will consume:

- A. 6.0 gallons
- B. 9.0 gallons
- C. 4.5 gallons
- D. 3.0 gallons

15. On a sectional, an airport depicted in magenta with tick marks around it and a small "C" in a magenta circle beside a frequency indicates:

- A. A towered field with a clearance-delivery frequency
- B. A non-towered field with fuel available and a CTAF

- C. A military field restricted to government aircraft
- D. A closed airport with no services

16. A microburst is encountered just after takeoff. The performance sequence the pilot experiences is:

- A. Initial performance gain, then a severe downdraft and performance loss
- B. A steady climb improvement throughout
- C. Smooth lift with no wind change
- D. A constant tailwind aiding the climb

17. A Sport Pilot wishes to share a flight's cost with a passenger and also demonstrate the airplane to a prospective buyer on the same flight. The pilot may legally:

- A. Share expenses equally but not demonstrate the airplane for sale
- B. Do both, since the buyer is also a passenger
- C. Demonstrate the airplane but not share expenses
- D. Do both if the flight stays in the local area

18. The propeller and the wing both produce a force from a pressure difference. If carburetor ice reduces engine RPM, the most direct effect on the propeller is:

- A. An increase in blade angle of attack
- B. A reduction in the thrust it can produce
- C. A decrease in the wing's stall speed
- D. An automatic feathering of the blades

19. A TAF group "TEMPO 2024 2SM BR" tells the pilot that between 2000Z and 2400Z:

- A. Conditions permanently become 2 miles in mist

- B. There is a 30% chance of 2 miles in mist
- C. Temporary, intermittent 2-mile visibility in mist is expected
- D. The visibility will gradually improve to 2 miles

20. Density altitude of 8,000 feet is computed at a 4,000-foot field on a hot day. For takeoff, the pilot should expect:

- A. Shorter ground roll and better climb than at the field elevation
- B. No change from standard-day performance
- C. Longer ground roll and reduced climb, as though at 8,000 feet
- D. A lower stall speed due to thinner air

21. A wing's critical angle of attack is exceeded in a steep turn at high speed. The result is:

- A. The wing cannot stall because the speed is high
- B. An accelerated stall, since the critical angle was exceeded
- C. An automatic reduction in load factor
- D. A decrease in the stall speed

22. A pilot must report which occurrence immediately to the NTSB under Part 830?

- A. A routine precautionary fuel stop
- B. A flat tire found after landing
- C. A minor paint scratch during taxi
- D. An in-flight fire or flight control malfunction

23. Variation and deviation differ in that variation is caused by:

- A. Magnetic fields within the aircraft itself

- B. The pilot's incorrect compass swing
- C. The angular difference between true and magnetic north
- D. Acceleration and turning errors of the compass

24. A pilot loses the alternator and notices a discharging ammeter. Integrating systems knowledge, the engine will:

- A. Stop within seconds as the battery drains
- B. Continue running on the self-contained magnetos
- C. Lose thrust as the spark plugs go dark
- D. Require an immediate restart in flight

25. A solid magenta line, a dashed magenta line, and a dashed blue line on a sectional respectively depict:

- A. Class B, Class C, and Class D
- B. Class D, Class B, and Class E surface
- C. Class C, Class E surface, and Class D
- D. Class E surface, Class D, and Class B

26. A pilot weighing slight fatigue, a marginal forecast, an unfamiliar destination, and schedule pressure should recognize that:

- A. Several individually acceptable risks can combine into an unacceptable total
- B. Only the weather factor is relevant to the go/no-go decision
- C. Each factor being acceptable guarantees a safe flight
- D. Fatigue alone determines the outcome

27. A pilot computes a true heading of 350° and applies 12°E variation, then a $+3^\circ$ deviation. The compass heading is:

- A. 341°
- B. 365°
- C. 359°
- D. 335°

28. A cold front and a warm front differ such that the cold front typically brings:

- A. Gentle, prolonged precipitation over a wide area
- B. Days of unchanging, calm weather
- C. Slowly lowering ceilings over many hours
- D. A narrow band of intense weather followed by rapid clearing

29. On approach behind a departing heavy aircraft, the pilot should, regarding wake turbulence:

- A. Land beyond the heavy's rotation point and below its path
- B. Match the heavy's exact flight path precisely
- C. Land short of the runway to stay clear
- D. Stay above its path and land beyond its liftoff point

30. A pilot reads a red radial line on the airspeed indicator. Operating beyond it risks:

- A. An aerodynamic stall at low speed
- B. A loss of electrical power
- C. Structural damage from exceeding V_{NE}
- D. Carburetor ice formation

31. A pilot determines the airplane is within gross weight, but adding a rear-seat passenger would move the CG aft of limits. The correct action is to:

- A. Decline the loading or shift weight forward to keep the CG in limits
- B. Depart, since total weight is acceptable
- C. Add fuel aft to balance the airplane
- D. Climb to a higher altitude to compensate

32. A SIGMET differs from an AIRMET in that the SIGMET warns of:

- A. Routine conditions along the route
- B. Weather of interest only to student pilots
- C. Ground observations rather than forecasts
- D. More severe, widespread hazards affecting all aircraft

33. A pilot experiences a partial power loss on climbout. The first priority, integrating systems and aerodynamics, is to:

- A. Lower the nose to maintain a safe glide airspeed
- B. Pull up to gain maximum altitude
- C. Bank steeply back toward the runway
- D. Increase the angle of attack to the critical limit

34. The day-VFR fuel reserve and the careless-or-reckless rule are both regulatory minimums. The fuel reserve specifically requires:

- A. One hour of fuel beyond the destination
- B. No reserve for flights under 50 NM
- C. Enough fuel to reach the destination plus 30 minutes at cruise
- D. Fuel sufficient only to the destination

35. A pilot sees an aircraft holding a constant position in the windscreen while enlarging. This indicates

- A. The aircraft is departing and poses no threat
- B. The aircraft is stationary on the ground
- C. A safe lateral separation already exists
- D. A collision course requiring early evasive action

36. Considering the whole flight envelope, total drag is at a minimum and efficiency greatest when:

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

37. A pilot planning night flight under MOSAIC must satisfy which combination?

- A. A driver's license alone, with no endorsement
- B. A first class medical and no training requirement
- C. Night training, an endorsement, and BasicMed or a third class medical
- D. A commercial certificate and an instrument rating

38. A pilot reads "OVC004" and "1/2SM" in a METAR with the destination shaded red on the flight-category chart. For day VFR, the pilot should:

- A. Proceed, since red indicates good conditions
- B. Climb above the layer using instruments
- C. Reduce speed and continue cautiously
- D. Treat the destination as a no-go and divert or delay

39. A propeller's blade twist and a wing's washout both manage angle of attack along their span. The propeller twist exists because:

- A. The blade root must produce more drag than the tip
- B. The tip travels faster than the root and needs a smaller blade angle
- C. The blade must be feathered automatically in cruise
- D. The root and tip move at identical speeds

40. A pilot finishing flight planning finds the computed takeoff distance equals 95% of the available runway on a hot, high day. The prudent decision is to:

- A. Depart, since the numbers technically fit
- B. Add weight to shorten the ground roll
- C. Reduce weight, await cooler air, or choose a longer runway
- D. Rotate early to lift off sooner

ANSWER KEY WITH EXPLANATIONS

1. C — Ineligible, because a revoked FAA medical disqualifies that provision. A revoked (or denied/suspended) FAA medical disqualifies the driver's-license provision until resolved, regardless of endorsements or a previously held medical. The night endorsement does not restore eligibility.

2. B — 59 knots calibrated airspeed. MOSAIC defines aircraft eligibility by a maximum clean stall speed of 59 KCAS; with proper endorsements, four seats, retractable gear, and a controllable-pitch propeller are allowed. The stall-speed standard is the gating limit.

3. D — Less than at 60° bank. A 45° bank produces about 1.4 G versus 2 G at 60°, so the stall-speed increase at 45° is less than at 60°. Steeper banks raise load factor and stall speed more sharply.

4. D — Radiation fog forming near the surface. A near-zero, falling spread with calm wind at dusk is the classic setup for radiation fog forming overnight. It signals reduced, not improving, visibility.

5. A — Carburetor ice was present and is now clearing. The brief RPM drop (warmer, less dense air) followed by a rise (melting ice restoring airflow) confirms carburetor ice was present and is clearing. A magneto or alternator fault would not show this pattern.

6. A — A direct headwind, reducing groundspeed with no crab required. A wind from 090° on a 090° course blows straight down the nose, a direct headwind that lowers groundspeed and needs no wind correction angle. A crosswind would come from a direction perpendicular to the course.

7. A — True course, wind, variation, deviation. From true course, corrections apply in the order wind (to true heading), variation (to magnetic heading), then deviation (to compass heading). This is the TVMDC chain.

8. A — Below VFR minimums and a clear no-go. A 1/2-mile visibility in fog with a 300-foot overcast is far below VFR minimums—a clear no-go for a day-VFR Sport Pilot. Gusts and an instrument climb are irrelevant to the legality.

9. B — Reduces stability and worsens stall recovery. An aft CG reduces longitudinal stability and worsens stall recovery, the defining aft-CG hazard. A forward CG, by contrast, increases stick force and stability.

10. D — The obstacle tops 2,049 feet MSL, so a higher altitude is needed. The figure "2049 (1232)" gives the top as 2,049 feet MSL (1,232 AGL), which is above the planned 2,000-foot route, so a higher altitude is required. The MSL top is the number to clear.

11. B — Anti-authority; "Follow the rules. They are usually right." Dismissing regulations as overly cautious is the anti-authority attitude, countered by "Follow the rules. They are usually right." Recognizing it is the protective step.

12. B — Turn coordinator, airspeed indicator, and altimeter. A vacuum failure disables the attitude and heading indicators but leaves the electric turn coordinator and the pitot-static airspeed indicator and altimeter reliable. These support partial-panel flight.

13. A — The pilot lacks instrument training and the inner ear induces spatial disorientation. A Sport Pilot must avoid clouds because the training and aircraft are not for instrument flight and the inner ear

induces spatial disorientation without an outside horizon. The compass does not simply stop, and clouds do not always contain icing.

14. C — 4.5 gallons. Leg time is $90 \div 120 = 0.75$ hr; fuel is $6 \text{ gph} \times 0.75 \text{ hr} = 4.5$ gallons. The chain is groundspeed \rightarrow time \rightarrow fuel.

15. B — A non-towered field with fuel available and a CTAF. Magenta marks a non-towered field, tick marks indicate fuel, and a "C" in a magenta circle denotes the CTAF. Together they describe a non-towered field with fuel and a common traffic frequency.

16. A — Initial performance gain, then a severe downdraft and performance loss. A microburst gives a brief performance gain (headwind), then a violent downdraft, then a performance-robbing tailwind. This sequence can be unrecoverable near the ground.

17. A — Share expenses equally but not demonstrate the airplane for sale. A Sport Pilot may share operating expenses equally but may not demonstrate an aircraft in flight to a prospective buyer. The sale demonstration is outside the privileges regardless of framing.

18. B — A reduction in the thrust it can produce. Carburetor ice cuts engine RPM, directly reducing the thrust the propeller produces. It does not feather the blades or lower the wing's stall speed.

19. C — Temporary, intermittent 2-mile visibility in mist is expected. "TEMPO 2024" marks temporary, intermittent conditions—here 2 miles in mist—between 2000Z and 2400Z. It is neither permanent nor a probability group.

20. C — Longer ground roll and reduced climb, as though at 8,000 feet. A density altitude of 8,000 feet means the airplane performs as though at that altitude—longer ground roll and reduced climb—despite the 4,000-foot field. Hot, high conditions degrade takeoff sharply.

21. B — An accelerated stall, since the critical angle was exceeded. Exceeding the critical angle of attack at high speed in a steep turn produces an accelerated stall; a wing can stall at any speed. Load factor does not self-reduce, and stall speed rises in the turn.

22. D — An in-flight fire or flight control malfunction. Part 830 requires immediate NTSB notification for serious events such as an in-flight fire or flight control malfunction. Routine stops and minor cosmetic damage are not reportable.

23. C — The angular difference between true and magnetic north. Variation is the angular difference between true and magnetic north at a location. Deviation, by contrast, comes from magnetic influences within the aircraft.

24. B — Continue running on the self-contained magnetos. With the alternator failed and the battery discharging, the engine keeps running on the self-contained magnetos. Only electrical equipment is at risk, not thrust.

25. C — Class C, Class E surface, and Class D. A solid magenta line is Class C, a dashed magenta line is the Class E surface area, and a dashed blue line is Class D. Each color/style pairs with a specific airspace.

26. A — Several individually acceptable risks can combine into an unacceptable total. The insidious danger is that several individually acceptable risks can accumulate into an unacceptable whole. Recognizing the combination is central to risk management.

27. A — 341° . True heading 350° with 12°E variation gives $350 - 12 = 338^\circ$ magnetic; applying $+3^\circ$ deviation gives 341° compass. The chain is true \rightarrow magnetic \rightarrow compass.

28. D — A narrow band of intense weather followed by rapid clearing. A cold front brings brief but violent weather then rapid clearing, while a warm front brings gentle, prolonged poor weather. Intensity and duration distinguish them.

29. D — Stay above its path and land beyond its liftoff point. Landing behind a departing heavy, the pilot stays above its climb path and lands beyond its liftoff point to avoid the sinking vortices. Matching its path or landing short courts a wake encounter.

30. C — Structural damage from exceeding V_{NE} . The red radial line marks V_{NE} ; exceeding it risks structural damage. It is not a stall, electrical, or carburetor concern.

31. A — Decline the loading or shift weight forward to keep the CG in limits. With the CG moving aft of limits, the pilot must decline that loading or shift weight forward, even though total weight is acceptable. An out-of-limits CG must never be flown.

32. D — More severe, widespread hazards affecting all aircraft. A SIGMET warns of more severe, widespread hazards affecting all aircraft, while an AIRMET covers less severe conditions. The distinction is severity and scope.

33. A — Lower the nose to maintain a safe glide airspeed. On a partial power loss during climbout, the first priority is to lower the nose to hold a safe glide airspeed and avoid a stall. Pulling up or banking steeply risks losing control.

34. C — Enough fuel to reach the destination plus 30 minutes at cruise. The day-VFR reserve requires fuel to reach the destination plus 30 minutes at normal cruise. It applies regardless of leg length.

35. D — A collision course requiring early evasive action. A target holding a constant windscreen position while enlarging is on a collision course, demanding early evasive action. A constant relative bearing with closing range is the classic collision cue.

36. D — Induced and parasite drag are balanced. Total drag is minimized—and efficiency greatest—where induced and parasite drag are balanced, giving the best lift-to-drag ratio. This is the most efficient airspeed.

37. C — Night training, an endorsement, and BasicMed or a third class medical. MOSAIC night flight requires night training, an endorsement, and BasicMed or a third class medical. A driver's license alone is insufficient, and no commercial/instrument rating is required.

38. D — Treat the destination as a no-go and divert or delay. A 400-foot overcast, 1/2-mile visibility, and red (IFR) shading make the destination a no-go for day VFR, so the pilot diverts or delays. A Sport Pilot cannot legally or safely climb on instruments.

39. B — The tip travels faster than the root and needs a smaller blade angle. The propeller's twist exists because the tip moves faster than the root, so it needs a smaller blade angle to keep a consistent angle of attack along the span. This equalizes the blade's effectiveness.

40. C — Reduce weight, await cooler air, or choose a longer runway. A takeoff distance at 95% of the available runway on a hot, high day leaves almost no margin, so the pilot should reduce weight, wait for cooler air, or choose a longer runway. Departing on the marginal numbers or rotating early courts an overrun.