SESSION 56: NAVIGATION — MIXED SCENARIO: FULL EN ROUTE PHASE SIMULATION

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1. ATC clears you to "climb via SID." This requires you to:

A. Climb immediately to the top altitude, ignoring restrictions

B. Comply with all published SID altitude (and speed) restrictions

C. Cancel the SID

D. Fly only the lateral path

2. The SID requires a 300 ft/NM climb gradient. At a groundspeed of 120 knots (2 NM per minute), the required climb rate is:

A. 300 fpm

B. 450 fpm

C. 900 fpm

D. 600 fpm

3. If your aircraft cannot meet the 300 ft/NM gradient, you should:

A. Fly the SID anyway

B. Reduce power to descend

C. Not accept that procedure and consider an alternative

D. Increase the bank angle

4. After the SID, ATC clears you to intercept and track V123 inbound to the VOR. To track inbound, you set the OBS to the:

A. Radial you are on

B. Aircraft heading

C. Reciprocal of the desired track

D. Desired course to the station with a TO indication

5. While intercepting, the CDI deflects to the right. The selected course is:

A. To the left

B. To the right; turn toward the needle to intercept

C. Behind you

D. Already centered

6. Tracking the airway, the CDI drifts left, so the wind is pushing you:

A. Right of course; turn left to re-intercept and establish a left wind correction

B. Left of course

C. Onto the course

D. Toward the station

7. ATC then clears you to intercept a 15 DME arc. Established on the arc with no wind, the station should be:

A. Ahead of you

B. Behind you

C. Off your wingtip (90 degrees to your track)

D. At your tail

8. Your DME reads 15.7 and increasing. You are:

A. Inside the arc

B. Outside the arc; turn toward the station to regain 15 DME

C. On the arc

D. Over the station

9. To fly the arc, you use the "turn ten, twist ten" technique, which means:

A. Bank 10 degrees

B. Fly 10 miles then turn

C. Turn the OBS first

D. After ~10 degrees of arc, turn the heading ~10 degrees and twist the OBS ~10 degrees to the next radial

10. Your WAAS GPS sequences through CDI sensitivity modes. In the en route phase, the default full-scale sensitivity is approximately:

A. ±0.3 NM

B. ±1 NM

C. ±2.5 degrees

D. ±5 NM

11. ATC assigns radar vectors. To prevent the GPS from sequencing to a waypoint you are not navigating to, you place it in:

A. Suspend (SUSP) or OBS mode

B. Approach mode

C. Terminal mode

D. En route mode

12. Cleared direct to a downstream fix, you execute a direct-to. The waypoints between your position and that fix are:

A. Flown in reverse

B. Retained as active legs

C. Bypassed from the active route

D. Converted to holds

13. Approaching the arrival, ATC clears you to "descend via the BENDR ONE arrival." This authorizes you to:

A. Maintain the last assigned altitude

B. Descend at will, ignoring restrictions

C. Climb to the top of the STAR

D. Descend to comply with all published altitude (and speed) restrictions on the STAR

14. A STAR waypoint shows "cross BENDR at or above 11,000." You must:

A. Be at or above 11,000 crossing BENDR

B. Cross at exactly 11,000

C. Be below 11,000

D. Descend to 11,000 after BENDR

15. Planning the descent, you must lose 6,000 feet. Using the 3-to-1 rule, you begin descent about:

A. 6 NM out

B. 12 NM out

C. 18 NM out

D. 9 NM out

16. A STAR waypoint is depicted with a circle around the symbol, indicating it is a:

A. Fly-by waypoint

B. Fly-over waypoint (cross before turning)

C. DME arc

D. Holding fix only

17. At a fly-by waypoint, the navigator will:

A. Overfly the waypoint before turning

B. Stop at the waypoint

C. Enter a hold

D. Begin the turn before the waypoint (turn anticipation)

18. Descending through 18,000 feet, you reset the altimeter from 29.92" to:

A. The field elevation

B. The current local altimeter setting

C. The departure setting

D. The standard datum

19. Descending through 10,000 feet at 270 knots, you must:

A. Slow to 250 knots or less by 10,000 feet

B. Maintain 270 knots

C. Slow to 200 knots

D. Maintain cruise speed

20. A published STAR speed restriction of "250K" at a waypoint below 10,000 feet must be:

A. Disregarded under radar control

B. Complied with as part of the descend-via clearance, unless ATC amends it

C. Applied only above FL180

D. Treated as advisory

21. Monitoring the FMS during the arrival, you verify that the constructed magenta-line path:

A. Matches the airspeed

B. Matches the altimeter setting

C. Matches the charted STAR (correct waypoints, sequence, and turns)

D. Matches the transponder code

22. If the magenta line disagrees with the cleared STAR, you should:

A. Stop, identify the error, and correct the flight plan before continuing

B. Follow the magenta line regardless

C. Disregard the clearance

D. Squawk 7600

23. If you cannot comply with a STAR crossing restriction, you should:

A. Descend below the restriction anyway

B. Advise ATC "unable" before the restriction so ATC can amend the clearance

C. Increase speed to make it

D. Comply partially and continue

24. Throughout the flight, your fundamental responsibility with the GPS/FMS is to remain:

A. The manager of the system — programming, verifying, and monitoring it

B. Passive once the route is loaded

C. Reliant on the moving map alone

D. Focused only on the autopilot

25. Summarizing Area V, the DPE asks the unifying principle of navigation systems. The best answer:

A. The equipment flies the aircraft without pilot involvement

B. A single navigation source is always sufficient

C. The pilot must select, configure, monitor, and verify the navigation system and procedures so the aircraft flies the precise intended path, complying with all altitude and speed requirements

D. Automation eliminates the need to understand the procedures

ANSWER KEY & EXPLANATIONS — SESSION 56

1. B. Comply with restrictions — "Climb via SID" requires complying with all published SID altitude (and speed) restrictions.

2. D. 600 fpm — 300 ft/NM × 2 NM/min (120 kt) = 600 fpm.

3. C. Don't accept/alternative — If unable to meet the climb gradient, do not accept that procedure and consider an alternative.

4. D. Desired course, TO — To track inbound, set the OBS to the desired course to the station with a TO indication.

5. B. Course to the right — A right CDI deflection means the selected course is to the right; turn toward the needle to intercept.

6. A. Drift left = right of course — A CDI drifting left means the wind pushed you right of course; turn left to re-intercept and establish a left wind correction.

7. C. Off the wingtip — Established on the arc with no wind, the station is off the wingtip (90 degrees to track).

8. B. Outside, turn toward — DME 15.7 and increasing means outside the arc; turn toward the station to regain 15 DME.

9. D. Turn ~10°, twist OBS ~10° — "Turn ten, twist ten" means after ~10 degrees of arc, turn the heading ~10 degrees and twist the OBS ~10 degrees to the next radial.

10. D. ±5 NM en route — En route mode default CDI sensitivity is approximately ±5 NM.

11. A. Suspend/OBS — On radar vectors, the GPS is placed in suspend (SUSP) or OBS to prevent sequencing to a waypoint not being navigated to.

12. C. Bypassed — After a direct-to a downstream fix, the intervening waypoints are bypassed from the active route.

13. D. Comply with restrictions — "Descend via the arrival" authorizes descending to comply with all published altitude (and speed) restrictions on the STAR.

14. A. At or above 11,000 — "Cross BENDR at or above 11,000" requires being at or above 11,000 crossing BENDR.

15. C. 18 NM — 6,000 feet to lose ÷ 1,000 × 3 = 18 NM.

16. B. Fly-over — A circled waypoint symbol indicates a fly-over waypoint (cross before turning).

17. D. Turn before — At a fly-by waypoint, the navigator begins the turn before the waypoint (turn anticipation).

18. B. Local setting — Descending through 18,000 feet, reset the altimeter from 29.92" to the current local altimeter setting.

19. A. Slow to ≤250 — Descending through 10,000 feet at 270 knots, slow to 250 knots or less by 10,000 feet.

20. B. Comply unless amended — A published STAR speed restriction must be complied with as part of the descend-via clearance, unless ATC amends it.

21. C. Matches the STAR — Monitoring the FMS, verify the constructed path matches the charted STAR (correct waypoints, sequence, and turns).

22. A. Identify/correct — A magenta-line/clearance disagreement should prompt stopping, identifying the error, and correcting the flight plan before continuing.

23. B. Advise "unable" — If unable to comply with a STAR crossing restriction, advise ATC "unable" before the restriction so ATC can amend the clearance.

24. A. Manager of the system — The pilot's fundamental responsibility with the GPS/FMS is to remain the manager of the system — programming, verifying, and monitoring it.

25. C. Select/configure/monitor/verify — The unifying Area V principle is that the pilot must select, configure, monitor, and verify the navigation system and procedures so the aircraft flies the precise intended path, complying with all altitude and speed requirements.