PRERNA AVIATION

DGCA CPL Practice Paper 11

Air Navigation - Route Planning

ANSWER KEY & EXPLAINED SOLUTIONS

2026-reviewed sectional practice. Not an official DGCA paper or a verified full-length latest-pattern mock.

01 D	02 D	03 B	04 B	05 A
06 A	07 A	08 D	09 D	10 B
11 C	12 C	13 A	14 D	15 C
16 D	17 C	18 C	19 B	20 A
21 B	22 D	23 B	24 A	25 C

01. A round trip consists of two 120 NM legs. Ground speeds are 120 kt outbound and 80 kt inbound. Average ground speed for the whole trip is:

Answer: D. 96 kt

Total time is 120/120 + 120/80 = 2.5 h. Total distance is 240 NM. Average ground speed is 240/2.5 = 96 kt, not the arithmetic mean of the speeds.

Topic: Average speed | Study reference: NAV

02. For a 300 NM route, ground speed towards destination is 120 kt and ground speed returning to departure is 180 kt. The equal-time point is how far from departure?

Answer: D. 180 NM

Let distance from departure be x. Equal times require x/180 = (300 - x)/120. Thus x = 300 × 180/(180 + 120) = 180 NM. The point is farther from departure because the return speed is greater.

Topic: Equal-time point | Study reference: NAV

03. Usable endurance after protecting the stated reserve is 4 hours. Outbound ground speed is 120 kt and homeward ground speed is 180 kt. Point-of-no-return distance from departure is:

Answer: B. 288 NM

At the limiting point, outbound time plus return time equals endurance. x/120 + x/180 = 4. Therefore x = 4 × 120 × 180/(120 + 180) = 288 NM. The stated reserve is already excluded.

Topic: Point of no return | Study reference: NAV

04. After 50 NM along track, an aircraft is 2 NM right of its intended track. There are 100 NM left along track. Approximate heading correction to reach destination is:

Answer: B. 3.6 degrees left

Using 1-in-60, track error is 60 × 2/50 = 2.4 degrees. Closing angle is 60 × 2/100 = 1.2 degrees. Add them and correct towards track: 3.6 degrees left, assuming unchanged wind.

Topic: Track recovery | Study reference: NAV

05. A wind of 30 kt makes a 60-degree angle with the intended track from ahead. Use cos 60 = 0.5 and sin 60 = 0.866. Its components are approximately:

Answer: A. 15 kt headwind and 26 kt crosswind

The along-track component is 30 × cos 60 = 15 kt headwind. The perpendicular component is 30 × sin 60 = 25.98 kt crosswind. A crosswind correction also changes the along-track component of aircraft velocity.

Topic: Wind resolution | Study reference: NAV

06. An aircraft has a TAS of 130 kt and is tracking perpendicular to a 50 kt wind. After fully correcting drift, ground speed is:

Answer: A. 120 kt

The heading correction uses 50 kt of the airspeed vector sideways. The remaining along-track component is square root of (130 squared - 50 squared) = square root of 14,400 = 120 kt.

Topic: Wind triangle | Study reference: NAV

07. A 90 NM leg is planned at 135 kt. Actual ground speed is 108 kt throughout. Arrival delay relative to plan is:

Answer: A. 10 minutes

Planned time = 90/135 × 60 = 40 min. Actual time = 90/108 × 60 = 50 min. Delay = 10 min.

Topic: Time revision | Study reference: NAV

08. Two aircraft fly in the same direction on the same track. The follower is 24 NM behind and gains at 40 kt. Catch-up time is:

Answer: D. 36 minutes

Closing speed is already given as 40 kt. Time = 24/40 h = 0.6 h = 36 min. The sum of the two aircraft speeds would apply to opposite-direction closure, not this case.

Topic: Relative motion | Study reference: NAV

09. Longitude changes by 12 degrees towards the east. Local mean time changes by:

Answer: D. 48 minutes later

Earth rotates 360 degrees in 24 h, or 4 min per degree. Twelve degrees east corresponds to 48 min later local mean time at the same instant.

Topic: Longitude and time | Study reference: NAV

10. At 1200 UTC, local mean time at longitude 37 degrees 30 minutes east is:

Answer: B. 1430

37 degrees 30 minutes is 37.5 degrees. At 4 min per degree, the time difference is 150 min = 2 h 30 min. East longitude is ahead of UTC, so LMT is 1430.

Topic: Local mean time | Study reference: NAV

11. A flight crosses 180 degrees longitude westbound. When converting to the local civil date, the usual International Date Line convention is to:

Answer: C. Add one day

Crossing the International Date Line westbound advances the local calendar date by one day; eastbound subtracts a day. The actual civil boundary has deviations, and UTC itself remains continuous.

Topic: Date line | Study reference: NAV

12. Two positions on the same meridian are 12 degrees 20 minutes north and 14 degrees 05 minutes north. Approximate north-south distance is:

Answer: C. 105 NM

Latitude difference is 1 degree 45 minutes = 105 minutes of arc. Along a meridian, one minute of latitude is approximately one nautical mile.

Topic: Latitude difference | Study reference: NAV

13. An aircraft has 96 L usable fuel and consumes 24 L/h. Protecting a specified 24 L reserve, maximum planned flying time before using that reserve is:

Answer: A. 3 hours

Fuel available before reserve = 96 - 24 = 72 L. At 24 L/h, time is 72/24 = 3 h. The reserve quantity is an exercise assumption.

Topic: Fuel endurance | Study reference: NAV

14. Fuel burn rises from 30 L/h to 36 L/h while usable fuel remains fixed. Endurance becomes what fraction of its previous value?

Answer: D. Five-sixths

Endurance equals fuel divided by consumption. New/old endurance = 30/36 = 5/6. A higher burn rate reduces endurance rather than increasing it.

Topic: Endurance ratio | Study reference: NAV

15. A 240 NM route is flown at 120 kt with fuel flow 28 L/h. Adding a stated 25% contingency on trip fuel only gives:

Answer: C. 70 L

Trip time = 240/120 = 2 h; trip fuel = 56 L. Exercise contingency is 0.25 × 56 = 14 L. Total = 70 L. This percentage is a calculation assumption, not a regulatory requirement.

Topic: Fuel calculation | Study reference: NAV

16. A chart distance of 5 cm represents 25 km. The chart scale is:

Answer: D. 1:500,000

25 km = 2,500,000 cm. Dividing both sides of 5:2,500,000 by 5 gives 1:500,000.

Topic: Scale determination | Study reference: NAV

17. At which latitude is one degree of longitude approximately 30 NM?

Answer: C. 60 degrees north or south

Distance per degree longitude is approximately 60 cos(latitude) NM. For 30 NM, cos(latitude) = 0.5, giving 60 degrees north or south.

Topic: Departure | Study reference: NAV

18. On a Lambert conformal conic chart, meridians are generally represented as:

Answer: C. Straight lines converging towards a common apex

Lambert conformal conic projection represents meridians as straight converging lines and parallels as arcs of concentric circles. This differs from the Mercator grid.

Topic: Chart projections | Study reference: NAV

19. A great-circle route plotted over a long distance generally requires true track to:

Answer: B. Change along the route, except special cases

A great circle generally crosses successive meridians at changing angles. Meridians and the equator are special cases. Constant true track is characteristic of a rhumb line.

Topic: Great-circle track | Study reference: NAV

20. A true course is 012 degrees and variation is 15 degrees west. Magnetic course is:

Answer: A. 027 degrees

To convert true to magnetic, add west variation. 012 + 15 = 027 degrees. Deviation is not included because no compass course is requested.

Topic: Variation | Study reference: NAV

21. Compass heading is 188 degrees with deviation 4 degrees west. Magnetic heading is:

Answer: B. 184 degrees

Magnetic = compass plus signed deviation, treating east as positive. 188 - 4 = 184 degrees. The reverse conversion requires the opposite operation.

Topic: Deviation | Study reference: NAV

22. The shortest angular difference between bearings 355 degrees and 015 degrees is:

Answer: D. 20 degrees

Crossing north, the difference is 5 degrees to 360 plus 15 degrees = 20 degrees. Simple subtraction without handling the wrap gives the longer angle.

Topic: Bearing arithmetic | Study reference: NAV

23. During a climb, ground speed is 100 kt and rate of climb is 500 ft/min. Approximate climb gradient is:

Answer: B. 300 ft/NM

100 kt = 100/60 NM/min. Gradient = 500 ÷ (100/60) = 300 ft/NM. Climb gradient depends on ground speed as well as vertical speed.

Topic: Climb gradient | Study reference: NAV

24. An aircraft at 9,000 ft must reach 3,000 ft using 300 ft/NM. Ignoring deceleration and level segments, descent distance is:

Answer: A. 20 NM

Height to lose = 9,000 - 3,000 = 6,000 ft. Distance = 6,000/300 = 20 NM.

Topic: Descent distance | Study reference: NAV

25. Position fixes disagree with the dead-reckoning estimate. The most useful first response is to:

Answer: C. Cross-check fix identification, time and wind assumptions

Errors can arise from station identification, timing, plotting or an inaccurate wind estimate. Cross-checking independent information helps identify the cause before changing the plan.

Topic: Navigation monitoring | Study reference: NAV

Study references & review notes

Use these sources to revise the concepts behind your answers. Questions and explanations are newly written; they are not reproduced from an official question bank.

NAV — FAA Pilot’s Handbook of Aeronautical Knowledge, Chapter 16: Navigation

https://www.faa.gov/sites/faa.gov/files/18_phak_ch16.pdf

Scope: foundation-to-intermediate CPL ground-subject practice. This set does not claim complete coverage of the latest DGCA syllabus. Consult the current DGCA CAR Section 7, Series B and Pariksha notices for the applicable syllabus and examination requirements. Aircraft-type-specific Technical Specific and a complete RTR(A) course are not included.

FAA references support general theory only, not Indian regulatory requirements. CAP 413 is used for standard phrase meanings, not UK-specific operating rules. Weather reports, fuel reserves and flight scenarios in questions are illustrative. For operational use, consult current approved publications and aircraft manuals.

Reviewed and prepared: 30 October 2026. Official session instructions and syllabus pointers were checked; exact current subject-wise question counts and durations were not independently verified.