

DGCA CPL Practice Paper 07

Technical General — Aerodynamics & Controls

QUESTION PAPER

Original educational practice set. Not an official DGCA paper or a full-length examination simulation.

25 MCQs • 25 marks • Suggested practice time: 40 minutes

Choose one answer per question. Practice scoring: +1 for a correct answer; 0 for an incorrect or blank answer. This timing and scoring are for this practice set only. A calculator may be used for practice. Use the assumptions stated in each question.

Name: _____ Date: _____ Score: ____ / 25

01. An aerofoil stalls when it exceeds its critical:

- | | |
|-----------------------------|--------------------|
| A. Ground speed | B. Angle of attack |
| C. Altitude above sea level | D. Heading |

02. Angle of attack is the angle between the wing chord line and:

- | | |
|--------------------------|---|
| A. The relative airflow | B. The aircraft's magnetic heading |
| C. The runway centreline | D. The geographical horizon in every case |

03. For steady, straight and level unaccelerated flight, the basic force relationships are:

- | | |
|--|--------------------------------|
| A. Lift equals weight and thrust equals drag | B. Thrust always equals weight |
| C. Lift exceeds weight continuously | D. Drag is zero |

04. Using $L = 0.5 \rho V^2 S C_L$, what happens to lift if speed doubles while ρ , S and C_L remain constant?

- | | |
|-------------------------|-----------------------------------|
| A. It remains unchanged | B. It becomes four times as large |
| C. It doubles | D. It halves |

05. At the same weight and configuration in steady level flight, reducing speed generally requires:

- | | |
|------------------------------------|--|
| A. An increase in lift coefficient | B. A reduction of lift coefficient to zero |
| C. The wing to produce no lift | D. Mass to increase automatically |

06. Induced drag is associated primarily with:

- | | |
|------------------------|-----------------------|
| A. Only engine exhaust | B. Producing lift |
| C. Only skin heating | D. Only tyre friction |

07. At constant weight in steady level flight, induced drag generally increases when speed:

- | | |
|----------------------------|---|
| A. Decreases | B. Is unrelated to lift |
| C. Increases without limit | D. Reaches zero while lift stays finite |

08. At otherwise similar conditions, parasite drag generally varies approximately with:

- | | |
|-----------------------------------|---------------------------|
| A. The inverse square of airspeed | B. Altitude only |
| C. Aircraft mass only | D. The square of airspeed |

09. For a simplified total-drag curve, minimum total drag occurs approximately where:
- A. Induced drag is zero
 - B. Lift is zero
 - C. Induced drag equals parasite drag
 - D. Parasite drag is zero
10. An aircraft in a level coordinated 60-degree banked turn has load factor $n = 1/\cos(\text{bank})$. What is n ?
- A. 1
 - B. 2
 - C. 1.41
 - D. 0.5
11. If the 1 g stall speed is 50 kt, what is the approximate stall speed at 2 g in the same configuration?
- A. 50 kt
 - B. 100 kt
 - C. 71 kt
 - D. 35 kt
12. Which primary control mainly produces roll on a conventional aeroplane?
- A. Elevator
 - B. Ailerons
 - C. Rudder
 - D. Throttle alone
13. Elevator movement mainly controls rotation about the:
- A. Longitudinal axis
 - B. Vertical axis
 - C. Lateral axis
 - D. Earth's polar axis
14. The rudder primarily controls:
- A. Cabin pressure
 - B. Roll about the longitudinal axis
 - C. Pitch about the lateral axis
 - D. Yaw about the vertical axis
15. Adverse yaw during an aileron-induced roll is mainly caused by:
- A. A difference in drag between the wings
 - B. A compass calibration error
 - C. Equal drag on both wings
 - D. Fuel automatically moving to the lower wing
16. In a conventional trailing-edge flap system, flap extension commonly:
- A. Eliminates drag
 - B. Makes angle of attack irrelevant
 - C. Raises stall speed in every case
 - D. Increases maximum lift coefficient and drag
17. Leading-edge slats primarily help by:
- A. Reducing wing area to zero
 - B. Removing all wingtip vortices
 - C. Delaying separation and increasing attainable angle of attack
 - D. Converting thrust into electrical power
18. Wing spoilers generally act to:
- A. Increase lift while eliminating drag
 - B. Increase fuel pressure
 - C. Replace the elevator in every aircraft
 - D. Reduce lift and increase drag
19. Trim is used mainly to:
- A. Guarantee zero angle of attack
 - B. Increase the aircraft's structural limit
 - C. Reduce sustained control force for a selected condition
 - D. Replace all primary controls

20. Positive static stability means an initial tendency after a disturbance to:

- A. Return toward the original equilibrium
- B. Oscillate with increasing amplitude in every case
- C. Remain at any displaced position without tendency
- D. Move farther from equilibrium

21. Moving the CG aft within the permitted range generally reduces:

- A. The need to check balance
- B. The aircraft's mass automatically
- C. Longitudinal static stability
- D. All drag to zero

22. Dihedral on a conventional wing contributes mainly to:

- A. Radio reception
- B. Lateral stability
- C. Cabin pressurisation
- D. Engine cooling

23. Ground effect generally reduces which component of drag near the surface?

- A. All form drag
- B. Landing-gear rolling resistance
- C. All skin-friction drag
- D. Induced drag

24. Wingtip vortices are generally strongest when an aircraft is:

- A. At zero lift
- B. Light and parked with engines off
- C. Always at its highest speed
- D. Heavy, clean and slow

25. Flutter is best described as:

- A. A compass alignment method
- B. A beneficial engine vibration
- C. Normal fuel vapour formation
- D. A potentially destructive interaction of aerodynamic, elastic and inertial forces