

DGCA CPL Practice Paper 03

Aviation Meteorology — Set A

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. Which gas forms the largest fraction of dry air near sea level?

- | | |
|-------------|-------------------|
| A. Hydrogen | B. Carbon dioxide |
| C. Oxygen | D. Nitrogen |

02. Most ordinary weather affecting low-level flight occurs in which atmospheric layer?

- | | |
|-----------------|----------------|
| A. Mesosphere | B. Troposphere |
| C. Thermosphere | D. Exosphere |

03. Using ISA sea-level temperature 15 C and a lapse rate of 2 C per 1,000 ft, what temperature is expected at 8,000 ft?

- | | |
|--------------|---------------|
| A. Minus 1 C | B. Minus 16 C |
| C. Plus 1 C | D. Plus 7 C |

04. At 5,000 ft, ISA temperature is taken as 5 C. If actual temperature is 20 C, what is the ISA deviation?

- | | |
|--------------|--------------|
| A. ISA -15 C | B. ISA +25 C |
| C. ISA +5 C | D. ISA +15 C |

05. At the same atmospheric pressure, warming dry air causes its density to:

- | | |
|---------------------|-----------------------------|
| A. Remain unchanged | B. Become equal to pressure |
| C. Decrease | D. Increase |

06. At the same temperature and total pressure, replacing some dry air with water vapour generally makes the air:

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|-------------------------------|--------------------------|
| A. More dense | B. Exactly equally dense |
| C. Denser only above freezing | D. Less dense |

07. Which combination generally produces the highest density altitude at a given aerodrome?

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|---|--------------------------------------|
| A. High pressure and dry cold air | B. High pressure and low temperature |
| C. Low temperature at standard pressure | D. Low pressure and high temperature |

08. What is an atmospheric temperature inversion?

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|--|--|
| A. Wind direction changes by exactly 180 degrees | B. Temperature increases with height through a layer |
| C. Pressure increases steadily with height | D. Temperature always falls 10 C per km |

09. After a small upward displacement, an unsaturated air parcel is colder than its surroundings. What is its tendency?

- | | |
|------------------------------------|--|
| A. Continue rising freely | B. Sink back toward its original level |
| C. Condense regardless of humidity | D. Remain permanently warmer |

10. An unsaturated parcel is warmer than its surroundings after being lifted. This indicates a tendency toward:

- | | |
|-------------------------------------|------------------|
| A. Permanent temperature inversion | B. Instability |
| C. Strong resistance to all lifting | D. Zero buoyancy |

11. A saturated rising parcel usually cools more slowly than a dry rising parcel because:

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|--------------------------------------|---------------------------------------|
| A. Condensation releases latent heat | B. Water droplets eliminate expansion |
| C. Condensation removes all gravity | D. Pressure stops decreasing |

12. Dew point is best defined as the temperature to which air must be cooled, at approximately constant pressure and water-vapour content, to:

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|------------------------|-------------------------|
| A. Become saturated | B. Reach ISA conditions |
| C. Double its pressure | D. Lose all oxygen |

13. If air temperature falls toward an unchanged dew point, relative humidity generally:

- | | |
|--------------|------------------------|
| A. Increases | B. Remains exactly 50% |
| C. Decreases | D. Becomes negative |

14. For a convective-cloud estimate, use cloud-base height AGL = $400 \times (\text{temperature minus dew point})$ in feet. If temperature is 27 C and dew point 17 C, estimate cloud base.

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|------------------|-----------------|
| A. 10,800 ft AGL | B. 400 ft AGL |
| C. 4,000 ft AGL | D. 1,000 ft AGL |

15. Which conditions most favour radiation fog over land?

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|---------------------------------------|--|
| A. Hot dry afternoon with strong wind | B. Very dry air over a warm surface |
| C. Thick cloud with strong dry wind | D. Clear night, moist air and light wind |

16. Advection fog is most closely associated with:

- | | |
|--|---|
| A. An aircraft climbing through ISA | B. Moist air moving over a colder surface |
| C. Only strong daytime surface heating | D. Dry air moving over a hotter surface |

17. A daytime sea breeze near a coastline usually blows at the surface:

- | | |
|--|----------------------------------|
| A. Parallel to the coast in every case | B. From sea toward warmer land |
| C. From land toward sea | D. From mountains toward valleys |

18. A katabatic wind is characteristically:

- A. A wind that exists only over the equator
- B. A constant-speed jet-stream wind
- C. A downslope flow of relatively cold dense air
- D. An upslope flow caused by daytime heating

19. In the Northern Hemisphere, the Coriolis effect deflects moving air to the:

- A. Left of its motion
- B. South in every case
- C. Right of its motion
- D. North in every case

20. Widely spaced isobars, compared with closely spaced isobars at the same map scale, usually indicate:

- A. A weaker pressure-gradient force
- B. A guaranteed calm wind at every height
- C. No atmospheric pressure
- D. A stronger pressure-gradient force

21. Above the friction layer, geostrophic wind is an ideal balance between:

- A. Pressure-gradient and Coriolis forces
- B. Lift and drag
- C. Centrifugal force and surface friction only
- D. Gravity and engine thrust

22. Compared with wind above the friction layer, surface friction generally causes wind to:

- A. Stop responding to pressure gradients
- B. Become exactly parallel to every isobar
- C. Speed up and cross toward higher pressure
- D. Slow and cross isobars toward lower pressure

23. Which cloud is most associated with strong vertical development and thunderstorms?

- A. Thin cirrus alone
- B. Fair-weather stratus alone
- C. Cumulonimbus
- D. Cirrostratus alone

24. Broad, relatively uniform layered cloud is more commonly associated with:

- A. Strong dry thermals alone
- B. A complete absence of moisture
- C. Stable air and gentle widespread lifting
- D. Only extreme surface heating

25. Atmospheric pressure normally decreases with altitude because:

- A. Air molecules stop moving
- B. Temperature must always increase
- C. Gravity reverses direction
- D. There is less air above the higher level