

# The Pilot and Air Traffic Controller Student Examination Instructor's Examination Guide Summary of Answers

## 3-B

This appendix to the Example Pilot and Air Traffic Controller Training Program contains a comprehensive examination covering all areas identified in Section 2. Appendix 3-B contains the student examination, an instructor's examination guide that contains the correct answers as well as the location by paragraph number of the information in Section 2 of the Wake Turbulence Training Aid, and a summary of answers.

## Table of Contents

Section	Page
Student Examination .....	3-B.1
Instructor's Examination Guide .....	3-B.5
Summary of Answers.....	3-B.11

(This page intentionally left blank)

## Student Examination

### Instructions

These questions are based on the material in the Wake Turbulence Training Aid. The answers to each question can be found in that document. The questions are all multiple choice. Circle the one answer to each question which is most correct.

### Questions

1. Wake turbulence is a result of
  - a. aircraft lift
  - b. aircraft propwash or jet exhaust
  - c. windshear
  - d. aircraft wingspan
2. The strength of the wake turbulence is governed by aircraft
  - a. speed
  - b. weight
  - c. wingspan
  - d. all of the above
3. Pressure differential created by the flow of air around the wingtips results in swirling air masses which trail downstream of the wingtips and produce
  - a. two counter rotating cylindrical vortices
  - b. two clockwise rotating cylindrical vortices
  - c. one large rotating cylindrical vortex
  - d. none of the above
4. Aircraft wake turbulence IFR separation categories are determined by the aircraft
  - a. speed
  - b. weight
  - c. aerodynamic wing shape
  - d. both a and b above
5. The usual hazard associated with encountering wake turbulence is
  - a. aircraft structural damage
  - b. induced rolling moment which exceeds roll control
  - c. inability to escape the wake core
  - d. none of the above
6. Before the air traffic controller may clear a pilot to follow an aircraft and fly a visual approach, the pilot must
  - a. have only the leading aircraft in sight
  - b. have both the leading aircraft and the airport in sight
  - c. cancel his or her IFR flight plan
  - d. be within 3 nautical miles of the runway or the leading aircraft

7. The pilot is responsible for avoiding wake turbulence when flying VFR weather, maintaining visual aircraft separation, and when cleared for a visual approach.
  - a. True
  - b. False
8. IFR radar-controlled longitudinal separation is applied between aircraft to ensure that sufficient time is available for the wake turbulence to completely dissipate.
  - a. True
  - b. False
9. The most important factor in the wake turbulence decay process is
  - a. atmospheric conditions
  - b. aerodynamic shape of the aircraft wing
  - c. aircraft approach speed
  - d. a and b above
10. Wake vortices initially descend at what rate?
  - a. 700 feet per minute
  - b. 300 feet per minute
  - c. 300 to 500 feet per minute
  - d. 100 feet per minute
11. The capability of an aircraft to counteract the roll imposed by the vortex primarily depends on its
  - a. control responsiveness
  - b. wingspan
  - c. wing sweep
  - d. a and b above
12. Wake turbulence is a hazard to aircraft landing on parallel runways separated by more than 2500 feet.
  - a. True
  - b. False
13. Tower controllers provide visual wake turbulence separation to arriving and departing aircraft of different wake turbulence categories.
  - a. True
  - b. False
14. Air traffic controllers may issue a take-off clearance, and waive take-off wake turbulence time and distance intervals under what circumstances?
  - a. A pilot specifically requests a waiver of the interval
  - b. A pilot specifically requests a waiver of the interval and the traffic permits
  - c. A pilot specifically requests a waiver of the interval, the traffic permits, and the pilot acknowledges separation responsibility
  - d. A pilot specifically requests a waiver of the interval, the traffic permits, and the controller issues a wake turbulence cautionary advisory

15. When considering wake turbulence, pilots should stay at or above the
  - a. ILS glideslope
  - b. lead aircraft
  - c. 3-degree descent path
  - d. lead aircraft's flightpath
16. Which situation represents the most likely wake turbulence landing hazard?
  - a. 3-knot quartering tailwind
  - b. 6-knot headwind
  - c. 12-knot crosswind
  - d. 10-knot headwind
17. When you are 3 miles from touchdown and 1 dot high on ILS glideslope, how many feet are you above the glideslope?
  - a. 325 feet
  - b. 32 feet
  - c. 78 feet
  - d. 156 feet
18. When does an aircraft produce the strongest wake turbulence, if all other parameters are equal?
  - a. At heavy weights
  - b. At slow speeds
  - c. In a clean-wing configuration
  - d. All of the above
19. Wake turbulence separation is a limiting factor in airport capacity at some airports.
  - a. True
  - b. False
20. When air traffic is providing radar control during VFR weather conditions, the pilot is relieved of the responsibility for assuring that the flightpath will avoid an encounter with wake turbulence.
  - a. True
  - b. False
21. Which of the following statements about helicopter-produced wake turbulence is false?
  - a. In forward flight, a helicopter produces a pair of trailing vortices like fixed-wing aircraft
  - b. In forward flight, a helicopter produces a single vortex trailing from the blades as they rotate into the flight direction
  - c. Vortex circulation in a hover is outward, upward, around and away from the main rotor(s) in all directions
  - d. Pilots of small aircraft should avoid operating within three rotor diameters of the hovering or stationary helicopter

22. A nose-high pitch attitude is a good indicator of a steep flightpath of the lead aircraft?
  - a. True
  - b. False
23. When landing behind a larger aircraft that is taking off on a crossing runway, which of the following statements is true?
  - a. Note the larger aircraft's rotation point and if it was before the intersection, continue the approach and land past the intersection
  - b. Note the larger aircraft's rotation point and if it was past the intersection, continue the approach and land before the intersection
  - c. It is not necessary to avoid flight below the larger aircraft's flightpath since it will not produce wake turbulence that close to the ground
  - d. Assure that your landing is at least 1 minute after the larger aircraft has rotated for takeoff
24. When taking off after a heavy aircraft has executed a low approach, missed approach or touch-and-go landing, what minimum elapsed time interval should be applied before departing or landing on the same runway?
  - a. 1 minute
  - b. 2 minutes
  - c. 3 minutes
  - d. No delay is required
25. Pilots must always maintain the minimum longitudinal wake turbulence separation distance appropriate for their aircraft category until the landing is completed.
  - a. True
  - b. False
26. After turning on to final approach behind another aircraft, it is observed that the leading aircraft is at a lower altitude. In this situation, the trailing aircraft will not encounter wake turbulence.
  - a. True
  - b. False

## Instructor's Examination Guide

### Instructions

This guide contains questions based on the material in the Wake Turbulence Training Aid. The answers to each question can be found in that document. The questions are all multiple choice. There is one answer to each question which is most correct. The correct answer is listed after each question, along with the section in Section 2 where the correct answer may be found.

### Questions

1. Wake turbulence is a result of

- a. aircraft lift
- b. aircraft propwash or jet exhaust
- c. windshear
- d. aircraft wingspan

Answer: a. (Section 2.4.1)

2. The strength of the wake turbulence is governed by aircraft

- a. speed
- b. weight
- c. wingspan
- d. all of the above

Answer: d. (Section 2.2)

3. Pressure differential created by the flow of air around the wingtips results in swirling air masses which trail downstream of the wingtips and produce

- a. two counter rotating cylindrical vortices
- b. two clockwise rotating cylindrical vortices
- c. one large rotating cylindrical vortex
- d. none of the above

Answer a. (Section 2.4.1)

4. Aircraft wake turbulence IFR separation categories are determined by the aircraft

- a. speed
- b. weight
- c. aerodynamic wing shape
- d. both a and b above

Answer: b. (Section 2.2)

5. The usual hazard associated with encountering wake turbulence is

- a. aircraft structural damage
- b. induced rolling moment which exceeds roll control
- c. inability to escape the wake core
- d. none of the above

Answer: b. (Section 2.4.3)

6. Before the air traffic controller may clear a pilot to follow an aircraft and fly a visual approach, the pilot must
- have only the leading aircraft in sight
  - have both the leading aircraft and the airport in sight
  - cancel his or her IFR flight plan
  - be within 3 nautical miles of the runway or the leading aircraft

Answer: a. (Section 2.7.1)

7. The pilot is responsible for avoiding wake turbulence when flying VFR, maintaining visual aircraft separation, and when cleared for a visual approach.
- True
  - False

Answer: a. (Section 2.7.1)

8. IFR radar-controlled longitudinal separation between aircraft is applied to ensure that sufficient time is available for the wake turbulence to completely dissipate.
- True
  - False

Answer: b. (Section 2.7.1)

9. The most important factor in the wake turbulence decay process is
- atmospheric conditions
  - aerodynamic shape of the aircraft wing
  - aircraft approach speed
  - a and b above

Answer: a. (Section 2.4.6)

10. Wake vortices initially descend at what rate?
- 700 feet per minute
  - 300 feet per minute
  - 300 to 500 feet per minute
  - 100 feet per minute

Answer: c. (Section 2.4.4)

11. The capability of an aircraft to counteract the roll imposed by the vortex primarily depends on its
- control responsiveness
  - wingspan
  - wing sweep
  - a and b above

Answer: b. (Section 2.11)

12. Wake turbulence is a hazard to aircraft landing on parallel runways separated by more than 2500 feet.
- True
  - False

Answer: b. (Section 2.4.5)

13. Tower controllers provide visual wake turbulence separation to arriving and departing aircraft of different wake turbulence categories.

- a. True
- b. False

Answer: b. (Section 2.6.3)

14. Air traffic controllers may issue a take-off clearance, and waive take-off wake turbulence time and distance intervals under what circumstances?

- a. A pilot specifically requests a waiver of the interval
- b. A pilot specifically requests a waiver of the interval and the traffic permits
- c. A pilot specifically requests a waiver of the interval, the traffic permits, and the pilot acknowledges separation responsibility
- d. A pilot specifically requests a waiver of the interval, the traffic permits, and the controller issues a wake turbulence cautionary advisory.

Answer: d. (Section 2.7.1)

15. When considering wake turbulence, pilots should stay at or above the

- a. ILS glideslope
- b. lead aircraft
- c. 3-degree descent path
- d. lead aircraft's flightpath

Answer: d. (Section 2.9.1)

16. Which situation represents the most likely wake turbulence landing hazard?

- a. 3-knot quartering tailwind
- b. 6-knot headwind
- c. 12-knot crosswind
- d. 10-knot headwind

Answer: a. (Section 2.4.5)

17. When you are 3 miles from touchdown and 1 dot high on ILS glideslope, how many feet are you above the glideslope?

- a. 325 feet
- b. 32 feet
- c. 78 feet
- d. 156 feet

Answer: c. (Section 2.10.3)

18. When does an aircraft produce the strongest wake turbulence, if all other parameters are equal?

- a. At heavy weights
- b. At slow speeds
- c. In a clean-wing configuration
- d. All of the above

Answer: d. (Section 2.2)

19. Wake turbulence separation is a limiting factor in airport capacity at some airports.

- a. True
- b. False

Answer: a. (Section 2.12)

20. When air traffic is providing radar control during VFR weather conditions, the pilot is relieved of the responsibility for assuring that the flightpath will avoid an encounter with wake turbulence.

- a. True
- b. False

Answer: b. (Section 2.7.1)

21. Which of the following statements about helicopter-produced wake turbulence is false?

- a. In forward flight, a helicopter produces a pair of trailing vortices like fixed-wing aircraft
- b. In forward flight, a helicopter produces a single vortex trailing from the blades as they rotate into the flight direction
- c. Vortex circulation in a hover is outward, upward, around and away from the main rotor(s) in all directions
- d. Pilots of small aircraft should avoid operating within three rotor diameters of the hovering or stationary helicopter

Answer: b. (Section 2.4.1)

22. A nose-high pitch attitude is a good indicator of a steep flightpath of the lead aircraft?

- a. True
- b. False

Answer: b. (Section 2.10.3)

23. When landing behind a larger aircraft that is taking off on a crossing runway, which of the following statements is true?

- a. Note the larger aircraft's rotation point and if it was before the intersection, continue the approach and land past the intersection
- b. Note the larger aircraft's rotation point and if it was past the intersection, continue the approach and land before the intersection
- c. It is not necessary to avoid flight below the larger aircraft's flightpath since it will not produce wake turbulence that close to the ground
- d. Assure that your landing is at least 1 minute after the larger aircraft has rotated for takeoff

Answer: b. (Section 2.8.1.5)

24. When taking off after a heavy aircraft has executed a low approach, missed approach or touch-and-go landing, what minimum elapsed time interval should be applied before departing or landing on the same runway?

- a. 1 minute
- b. 2 minutes
- c. 3 minutes
- d. No delay is required

Answer: b. (Section 2.8.1.8)

---

25. Pilots must always maintain the minimum longitudinal wake turbulence separation distance appropriate for their aircraft category until the landing is completed.

- a. True
- b. False

Answer: b. (Section 2.6.2)

26. After turning on to final approach behind another aircraft, it is observed that the leading aircraft is at a lower altitude. In this situation, the trailing aircraft will not encounter wake turbulence.

- a. True
- b. False

Answer: b. (Section 2.9.1)

(This page intentionally left blank)

---

**Summary of Answers**

1	A
2	D
3	A
4	B
5	B
6	A
7	A
8	B
9	A
10	C
11	B
12	B
13	B
14	D
15	D
16	A
17	C
18	D
19	A
20	B
21	B
22	B
23	B
24	B
25	B
26	B

(This page intentionally left blank)