Questions

1. Two identical aeroplanes of different masses are descending at idle thrust. Which of the following statements correctly describes their descent characteristics?

a. At a given angle of attack, both the vertical and the forward speed are greater for the heavier aeroplane
b. There is no difference between the descent characteristics of the two aeroplanes
c. At a given angle of attack the heavier aeroplane will always glide further than the lighter aeroplane
d. At a given angle of attack the lighter aeroplane will always glide further than the heavier aeroplane

2. In a steady descending flight equilibrium of forces acting on the aeroplane is given by: (T = Thrust, D = Drag, W = Weight, descent angle = GAMMA)

a. T + D = - W sin GAMMA
b. T + W sin GAMMA = D
c. T - W sin GAMMA = D
d. T - D = W sin GAMMA

3. Which of the following combinations has an effect on the angle of descent in a glide? (Ignore compressibility effects.)

a. Configuration and mass
b. Configuration and angle of attack
c. Mass and altitude
d. Altitude and configuration

4. Which statement is correct for a descent without engine thrust at maximum lift to drag ratio speed?

a. The mass of an aeroplane does not have any effect on the speed for descent
b. The higher the gross mass the greater is the speed for descent
c. The higher the gross mass the lower is the speed for descent
d. The higher the average temperature (OAT) the lower is the speed for descent

5. An aeroplane is in a power-off glide at best gliding speed. If the pilot increases pitch attitude, the glide distance:

a. increases
b. remains the same
c. may increase or decrease depending on the aeroplane
d. decreases

6. Is there any difference between the vertical speed versus forward speed curves for two identical aeroplanes having different masses? (Assume zero thrust and wind).

a. Yes, the difference is that the lighter aeroplane will always glide a greater distance
b. Yes, the difference is that for a given angle of attack both the vertical and forward speeds of the heavier aeroplane will be larger
c. No difference
d. Yes, the difference is that the heavier aeroplane will always glide a greater distance

7. Which statement is correct for a descent without engine thrust at maximum lift to drag ratio speed?

a. A tailwind component increases fuel and time to descent
b. A tailwind component decreases the ground distance
c. A tailwind component increases the ground distance
d. A headwind component increases the ground distance

8. An aeroplane executes a steady glide at the speed for minimum glide angle. If the forward speed is kept constant at V_{MD}, what is the effect of a lower mass on the rate of descent / glide angle / C_L/C_D ratio?

a. decreases / constant / decreases
b. increases / increases / constant
c. increases / constant / increases
d. decreases / constant/ constant

9. Which of the following factors leads to the maximum flight time of a glide?

a. Low mass
b. High mass
c. Headwind
d. Tailwind

10. A constant headwind:

a. increases the descent distance over ground
b. increases the angle of the descent flight path
c. increases the angle of descent
d. increases the rate of descent

11. An aeroplane carries out a descent maintaining a constant Mach number in the first part of the descent and then at a constant indicated airspeed in the second part of the descent. How does the angle of descent change in the first and in the second part of the descent?

Assume idle thrust and clean configuration and ignore compressibility effects.

a. Increases in the first part; is constant in the second
b. Increases in the first part; decreases in the second
c. Is constant in the first part; decreases in the second
d. Decreases in the first part; increases in the second

12. During a glide at a constant Mach number, the pitch angle of the aeroplane will:

a. decrease
b. increase
c. increase at first and decrease later on
d. remain constant

13. Which of the following factors will lead to an increase of ground distance during a glide, while maintaining the appropriate minimum glide angle speed?

a. Headwind
b. Tailwind
c. Increase of aircraft mass
d. Decrease of aircraft mass

14. A twin jet aeroplane is in cruise, with one engine inoperative, and has to overfly a high terrain area. In order to allow the greatest height clearance, the appropriate airspeed must be the airspeed:

a. giving the greatest C_D/C_L ratio
b. for long range cruise
c. of greatest lift-to-drag ratio
d. giving the lowest C_L/C_D ratio

15. What is the effect of increased mass on the performance of a gliding aeroplane at V_{MD}?

a. The lift/drag ratio decreases
b. The speed for best angle of descent increases
c. There is no effect
d. The gliding angle decreases

16. A twin-engine aeroplane in cruise flight with one engine inoperative has to fly over high ground. In order to maintain the highest possible altitude the pilot should choose:

a. the speed corresponding to the minimum value of lift / drag ratio
b. the speed at the maximum lift
c. the speed corresponding to the maximum value of the lift / drag ratio
d. the long range speed

17. With all engines out, a pilot wants to fly for maximum time. Therefore, he has to fly the speed corresponding to:

a. the minimum power required
b. the critical Mach number
c. the minimum angle of descent
d. the maximum lift

18. Descending from cruising altitude to ground level at a constant IAS in a headwind, compared to still air conditions, will:

a. reduce the time to descend
b. increase the time to descend
c. reduce the ground distance taken
d. reduce the fuel used in the descent

19. When descending at a constant Mach number:

a. the angle of attack remains constant
b. the IAS decreases then increases
c. the pitch angle will increase
d. the pitch angle will decrease