

Aerody definitions and theory

- 1 A stagnation point on a body in a moving airstream is a point where:
 - a) the pressure on the surface is equal to the ambient atmospheric pressure.
 - b) the velocity of the relative airflow is zero and the surface pressure is higher than the ambient atmospheric pressure.
 - c) the velocity of the relative airflow is zero and the surface pressure is lower than the ambient atmospheric pressure.
 - d) the velocity of the relative airflow reaches its maximum and the surface pressure is higher than the ambient atmospheric pressure.

- 2 The centre of pressure is the point:
 - a) on the chord line through which the total reaction acts
 - b) through which weight acts
 - c) on the mean camber line through which lift acts
 - d) through which thrust acts

- 3 The Centre of Pressure of an aerofoil is at its most forward position:
 - a) at zero degrees angle of attack
 - b) at the angle of attack for the best lift/drag ratio
 - c) at the stall
 - d) at approximately 12° angle of attack

- 4 The mean camber line is:-
 - a) the straight line between the leading and trailing edges.
 - b) the distance between the chord line and mean chamber line.
 - c) the line between leading and trailing edge half way between the upper and lower surface.
 - d) the line which follows the top surface of the wing.

- 5 The centre of pressure of an aerofoil is the point:
 - a) through which thrust acts
 - b) through which weight acts
 - c) on the mean camber line through which lift acts
 - d) on the chord line through which total reaction acts

- 6 For a given speed and angle of attack, if the camber of an aerofoil is increased
 - a) the lift will decrease
 - b) lift will increase
 - c) lift and drag will increase
 - d) lift will increase and drag will decrease

- 7 For a given angle of attack and speed, if the thickness/chord ratio of an aerofoil is increased
- a) lift and drag will decrease
 - b) lift and drag will increase
 - c) the stalling angle will decrease
 - d) the stalling angle will not change
- 8 The chord of an aerofoil is
- a) the thickness at the point of maximum camber
 - b) the straight line joining leading edge to trailing edge
 - c) the distance between the leading edge and trailing edge measured along the bottom of the wing
 - d) the distance from leading edge to trailing edge measured in a straight line
- 9 The expression "Span squared over area" refers to
- a) wing loading
 - b) aspect ratio
 - c) power loading
 - d) thickness
- 10 Camber associates the following wing dimensions
- a) span and chord
 - b) span and thickness
 - c) chord and thickness
 - d) chord and area
- 11 The chord of a wing is measured
- a) parallel to the longitudinal axis of the aircraft
 - b) at right angles to the leading edge
 - c) at right angles to the spar
 - d) perpendicular to the trailing edge
- 12 Wing loading when increased by increasing the aircrafts AUW will
- a) increase stalling speed
 - b) decrease stalling speed
 - c) have no effect on stalling speed
 - d) decrease the stall speed by the square root of the weight.

- 13 In relation to the free stream airflow, the airflow over the upper surface of the wing:
- a) decreases in velocity and increases in pressure
 - b) decreases in velocity and decreases in pressure
 - c) increases in velocity and decreases in pressure
 - d) increases in velocity and pressure
- 14 The mean camber line is:-
- a) the straight line between the leading and trailing edges.
 - b) the distance between the chord line and mean chamber line.
 - c) the line between leading and trailing edge half way between the upper and lower surface.
 - d) the line which follows the top surface of the wing.
- 15 The laminar boundary layer:-
- a) is the boundary layer in front of the transition point.
 - b) is the boundary layer between the transition and separation point.
 - c) separates from the aerofoil at the separation point.
 - d) occurs on the underside of the wing.
- 16 The transition point on a wing is the point where:
- a) the flow separates from the wing surface
 - b) the boundary layer flow changes from laminar to turbulent
 - c) the boundary layer is stationary
 - d) the boundary layer is at free stream velocity
- 17 Lift is the component of the total reaction that is:-
- a) always opposite to weight.
 - b) perpendicular to the chord line.
 - c) at right angles to the relative airflow.
 - d) perpendicular to the longitudinal axis.
- 18 The angle of attack is the angle between:-
- a) the chord line and the longitudinal axis.
 - b) the mean chamber line and the chord line.
 - c) the longitudinal axis and the chord line.
 - d) the relative airflow and the chord line.

- 19 The angle of incidence is the angle between:-
- a) the relative airflow and chord line.
 - b) the longitudinal axis and the chord line.
 - c) the mean chamber line and the longitudinal axis.
 - d) the longitudinal axis and the relative airflow.
- 20 Drag is the component of the total reaction that is:-
- a) parallel to the longitudinal axis.
 - b) perpendicular to the longitudinal axis.
 - c) parallel to the relative airflow.
 - d) parallel to the chord line.
- 21 A high Aspect ratio wing:
- a) Reduces aircraft drag
 - b) Reduces parasite drag
 - c) Reduces induced drag
 - d) Reduces interference drag
- 22 Laminar airflow is that airflow which exists:
- a) between the aileron and the wing;
 - b) ahead of the transition point;
 - c) either side of the rudder;
 - d) ahead of the separation point.
- 23 The angle of attack is the angle between the aeroplane's
- a) longitudinal axis and the relative airflow
 - b) longitudinal axis and the horizontal
 - c) wing chord and relative airflow
 - d) wing chord and longitudinal axis
- 24 The separation point is:-
- a) in front of the transition point.
 - b) the point where the laminar boundary layer becomes turbulent.
 - c) the point at which the boundary layer detaches from the aerofoil.
 - d) where the flow divides to pass above and below the wing.
- 25 The transition point on an aerofoil surface is the point at which:
- a) the turbulent boundary layer becomes laminar;
 - b) the laminar boundary layer becomes turbulent;
 - c) the airflow separates to flow over and under the wing;
 - d) positive lift changes to negative lift.

Answers

1.b 2.a 3.c 4.c 5.d 6.c 7.a 8.d 9.b 10.c 11.a 12.a 13.c

**14.c 15.a 16.b 17.c 18.d 19.b 20.c 21.c 22.b 23.c 24.c
25.b**