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Part-FCL question bank

SPL

(Excerpt)

Published sample questions

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1 With regard to the forces acting, how can stationary gliding be described?

☑A) The sum of air forces compensates the gravity force
☐B) The sum the air forces acts along with the lift force
☐C) The lift force compensates the drag force
☐D) The sum of air forces acts along the direction of air flow

2 Following a single-wing stall and pitch-down moment, how can a spin be prevented?

☑A) Rudder opposite lower wing, releasing elevator to build up speed
☐B) Pushing the elevator to build up speed to re-attach airflow on wings
☐C) Deflect all rudders opposite to lower wing
☐D) Pulling the elevator to bring the plane back to normal attitude

3 Considering longitudinal stability, which C.G. position is most dangerous with a normal gliding plane?

☐A) Position beyond the front C.G. limit
☐B) Position far back within permissable C.G. limits
☑C) Position beyond the rear C.G. limit
☐D) Position too far aside permissable C.G. limits.

4 Bernoulli's equation for frictionless, incompressible gases states that...

☑A) total pressure = dynamic pressure + static pressure.
☐B) dynamic pressure = total pressure + static pressure.
☐C) static pressure = total pressure + dynamic pressure.
☐D) total pressure = dynamic pressure - static pressure.

5 The center of pressure is the theoretical point of origin of...

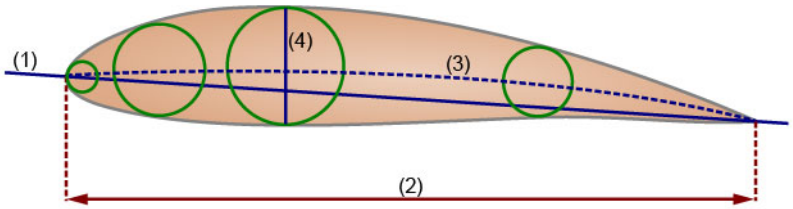
☐A) gravity and aerodynamic forces.
☐B) gravity forces of the profile.
☐C) only the resulting total drag.
☑D) all aerodynamic forces of the profile.

6 Number 2 in the drawing corresponds to the...

See figure (PFA-010)

Please pay attention to annex 1

☐A) profile thickness.
☐B) chord line.
☐C) angle of attack.
☑D) chord.



PFA-010

7 The angle of attack is the angle between...

☐A) the chord line and the longitudinal axis of an aeroplane.
☑B) the chord line and the oncoming airflow.
☐C) the wing and the fuselage of an aeroplane.
☐D) the undisturbed airflow and the longitudinal axis of an aeroplane.

8 The ratio of span and mean chord length is referred to as...

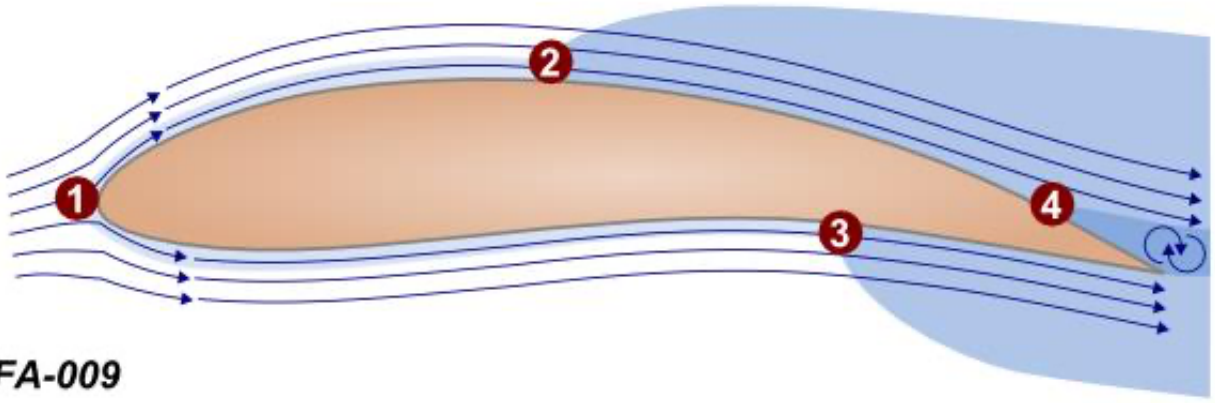
☐A) tapering.
☐B) trapezium shape.
☑C) aspect ratio.
☐D) wing sweep.

9 Which point on the aerofoil is represented by number 4?

See figure (PFA-009)

Please pay attention to annex 2

☑A) Separation point
☐B) Transition point
☐C) Center of pressure
☐D) Stagnation point



PFA-009

10 What pressure pattern can be observed at a lift-generating wing profile at positive angle of attack?

☐A) High pressure is created above, lower pressure below the profile
☑B) Low pressure is created above, higher pressure below the profile
☐C) Pressure below remains unchanged, lower pressure is created above the profile
☐D) Pressure above remains unchanged, higher pressure is created below the profile

11 Which statement about the airflow around an aerofoil is correct if the angle of attack increases?

☑A) The stagnation point moves down
☐B) The center of pressure moves down
☐C) The center of pressure moves up
☐D) The stagnation point moves up

12 Which option states a benefit of wing washout?

☐A) Greater hardness because the wing can withstand more torsion forces
☑B) At high angles of attack the effectiveness of the aileron is retained as long as possible
☐C) With the washout the form drag reduces at high speeds
☐D) Structurally the wing is made more rigid against rotation

13 When increasing the airflow speed by a factor of 2 while keeping all other parameters constant, how does the parasite drag change approximately?

☐A) It decreases by a factor of 4

☐B) It increases by a factor of 2
☑C) It increases by a factor of 4

☐D) It decreases by a factor of 2

14 Pressure compensation on a wing occurs at the...

☑A) wing tips.
☐B) wing roots.
☐C) leading edge.
☐D) fuselage connections.

15 Which of the following options is likely to produce large induced drag?

☑A) Small aspect ratio
☐B) Large aspect ratio
☐C) Low lift coefficients
☐D) Tapered wings

16 How do induced drag and parasite drag change with increasing airspeed during a horizontal and stable cruise flight?

☐A) Induced drag increases and parasite drag increases
☑B) Induced drag decreases and parasite drag increases
☐C) Parasite drag decreases and induced drag increases
☐D) Parasite drag decreases and induced drag decreases

17 Which effect does a decreasing airspeed have on the induced drag during a horizontal and stable cruise flight?

☐A) The induced drag will slightly decrease
☐B) The induced drag will remain constant
☑C) The induced drag will increase
☐D) The induced drag will collapse

18 Which kinds of drag contribute to total drag?

☐A) Interference drag and parasite drag
☐B) Induced drag, form drag, skin-friction drag
☑C) Induced drag and parasite drag
☐D) Form drag, skin-friction drag, interference drag

19 How do lift and drag change when approaching a stall condition?

☐A) Lift and drag increase
☑B) Lift decreases and drag increases
☐C) Lift increases and drag decreases
☐D) Lift and drag decrease

20 What leads to a decreased stall speed Vs (IAS)?

☐A) Lower density
☐B) Higher load factor
☑C) Decreasing weight
☐D) Lower altitude

21 What types of boundary layers can be found on an aerofoil?

☑A) Laminar layer at the leading wing areas, turbulent boundary layer at the trailing areas
☐B) Laminar boundary layer along the complete upper surface with non-separated airflow
☐C) Turbulent layer at the leading wing areas, laminar boundary layer at the trailing areas
☐D) Turbulent boundary layer along the complete upper surface with separated airflow

22 What structural item provides lateral stability to an airplane?

☐A) Differential aileron deflection
☐B) Elevator
☐C) Vertical tail
☑D) Wing dihedral

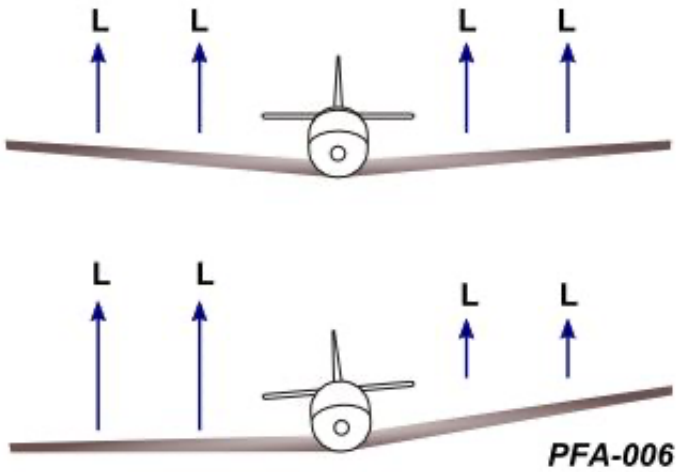
23 Which constructive feature is shown in the figure?

See figure (PFA-006)

L: Lift

Please pay attention to annex 3

☑A) Lateral stability by wing dihedral
☐B) Differential aileron deflection
☐C) Longitudinal stability by wing dihedral
☐D) Directional stability by lift generation



24 "Longitudinal stability" is referred to as stability around which axis?

☐A) Vertical axis
☑B) Lateral axis
☐C) Longitudinal axis
☐D) Propeller axis

25 Stability around which axis is mainly influenced by the center of gravity's longitudinal position?

☐A) Gravity axis
☐B) Vertical axis
☐C) Longitudinal axis
☑D) Lateral axis

26 Rotation around the vertical axis is called...

☑A) yawing.
☐B) rolling.
☐C) slipping.
☐D) pitching.

27 The critical angle of attack...

☐A) decreases with a rear centre of gravity.
☐B) increases with a front centre of gravity.
☑C) is not changed by different aircraft weights.
☐D) is changed by different aircraft weights.

28 What is the function of the horizontal tail (among other things)?

☐A) To stabilise the aeroplane around the longitudinal axis
☐B) To initiate a curve around the vertical axis
☑C) To stabilise the aeroplane around the lateral axis

☐D) To stabilise the aeroplane around the vertical axis

29 Rudder deflections result in a turn of the aeroplane around the...

☐A) longitudinal axis.
☐B) rudder axis.
☑C) vertical axis.
☐D) lateral axis.

30 What is the advantage of differential aileron movement?

☑A) The drag of the downwards deflected aileron is lowered and the adverse yaw is smaller
☐B) The total lift remains constant during aileron deflection
☐C) The ratio of the drag coefficient to lift coefficient is increased
☐D) The adverse yaw is higher

31 The aerodynamic rudder balance...

☐A) improves the rudder effectiveness.
☐B) reduces the control surfaces.
☑C) reduces the control stick forces.
☐D) delays the stall.

32 What describes "wing loading"?

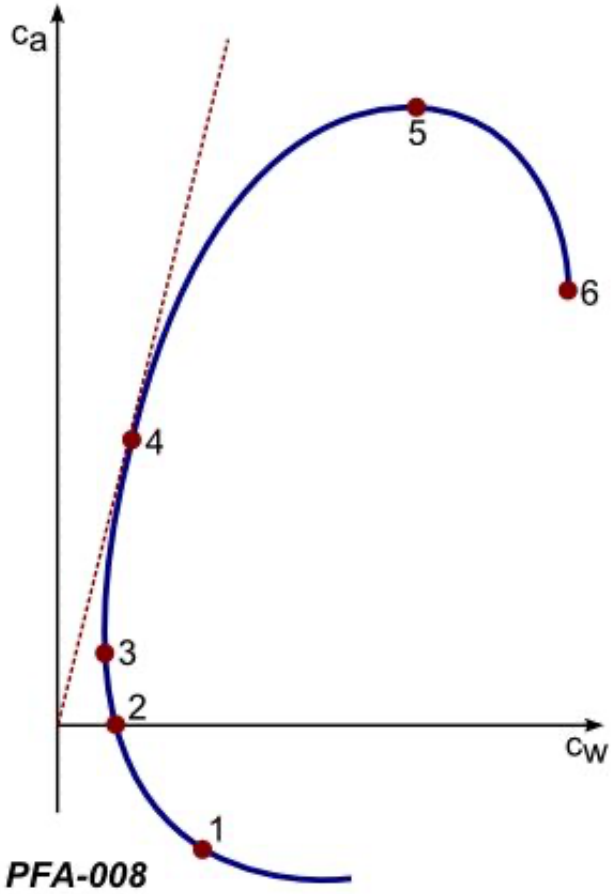
☐A) Drag per weight
☐B) Drag per wing area
☐C) Wing area per weight
☑D) Weight per wing area

33 Point number 1 in the figure indicates which flight state?

See figure (PFA-008)

Please pay attention to annex 4

☐A) Best gliding angle
☑B) Inverted flight
☐C) Slow flight
☐D) Stall



PFA-008

34 What can be said about the load factor (n) and the stall speed (Vs) in a co-ordinated turn?

☐A) n is larger than 1, Vs is lower than in straight and level flight.

☐B) n is lower than 1, Vs is higher than in straight and level flight.

☑C) n is larger than 1, Vs is higher than in straight and level flight.
☐D) n is lower than 1, Vs is lower than in straight and level flight.

35 During approch to the next updraft, the vertical speed indicator reads 3 m/s descent. Within the updraft you expect a mean rate of climb of 2 m/s.

According McCready, how should you adjust the speed during approach of the updraft?

☐A) The McCready ring should be set to 3 m/s,
the recommended speed can be read at the McCready scale next to the expected rate of climb (2 m/s).

☐B) Outside of thermal cells, the McCready ring should be set to 0 m/s,
the recommended speed can be read at the McCready scale next to the current rate of descent (3 m/s).

☐C) The McCready ring should be set to 2 m/s,
the recommended speed can be read at the McCready scale next to the sum of current rate of descent at expected rate of climb (5 m/s).

☑D) The McCready ring should be set to 2 m/s,
the recommended speed can be read at the McCready scale next to the current rate of descent (3 m/s).

36 What engine design at a Touring Motor Glider (TMG) results in least drag?

☐A) Engine and propeller mounted fix on the fuselage.

☐B) Engine and propeller mounted fix at the aircraft's nose
☑C) Engine and propeller mounted stowable on the fuselage
☐D) Engine and propeller mounted fix at the horizontal stabilizer

37 The glide ratio of a sailplane can be improved by which measures?

☑A) Cleaning, correct speed, retractable gear, taped gaps between wing and fuselage
☐B) higher airplane mass, thin airfoil, taped gaps between wing and fuselage

☐C) lower airplane mass, correct speed, retractable gear
☐D) forward C.G. position, correct speed, taped gaps between wing and fuselage

38 What effect is referred to as "adverse yaw"?

☐A) Aileron operation results in a yaw to the desired side due to less drag at the down-deflected aileron
☐B) Aileron operation results in a yaw to the opposite side due to more drag at the up-deflected aileron
☐C) Rudder operation results in a rolling moment to the opposite side due to more lift generated by the faster moving wing.
☑D) Aileron operation results in a yaw to the opposite side due to more drag at the down-deflected aileron

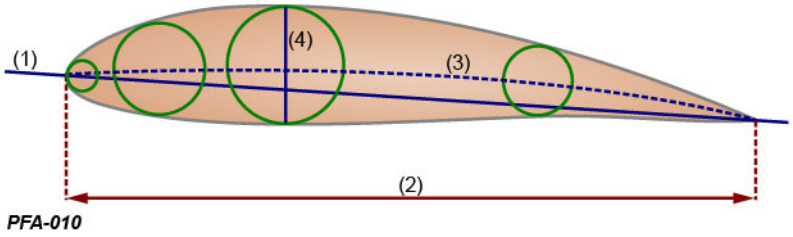
39 What is meant by "ground effect"?

☐A) Increase of lift and increase of induced drag close to the ground

☑B) Increase of lift and decrease of induced drag close to the ground
☐C) Decrease of lift and decrease of induced drag close to the ground

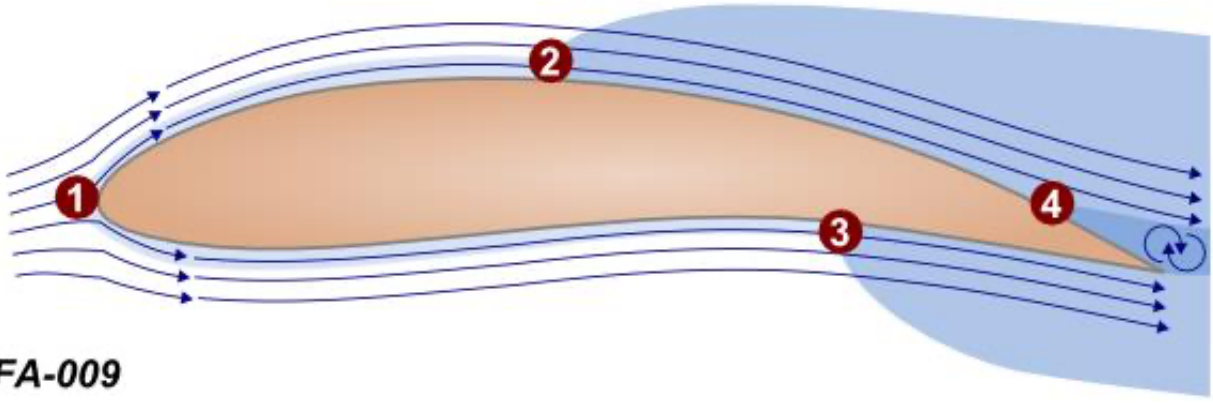
☐D) Decrease of lift and increase of induced drag close to the ground

Annex 1



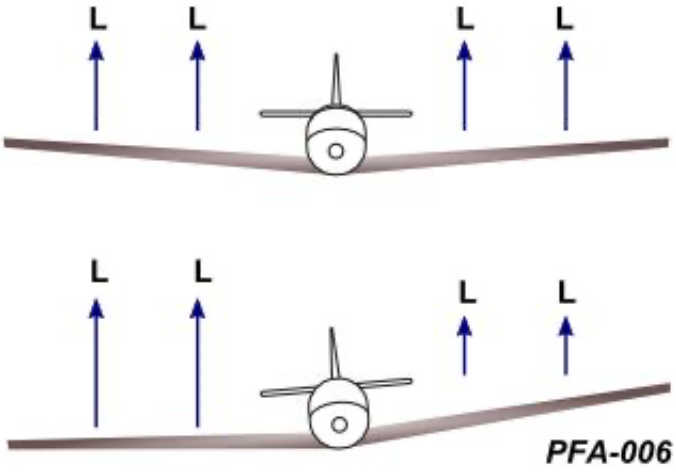
PFA-010

Annex 2



PFA-009

Annex 3



Annex 4