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80 – Aircraft General Knowledge

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1 Which levers in a glider's cockpit are indicated by the colors red, blue and green?

Levers for usage of ... (1,00 P.)

- ☐ gear, speed brakes and elevator trim tab.
- ☐ speed brakes, cable release and elevator trim.
- ☐ speed brakes, cabin hood lock and gear.
- ☑ cabin hood release, speed brakes, elevator trim.

2 The thickness of the wing is defined as the distance between the lower and the upper side of the wing at the... (1,00 P.)

- ☐ thinnest part of the wing.
- ☐ most inner part of the wing.
- ☑ thickest part of the wing.
- ☐ most outer part of the wing.

3 How is referred to a tubular steel construction with a non self-supporting skin? (1,00 P.)

- ☑ Grid construction
- ☐ Honeycomb structure

- ☐ Monocoque construction
- ☐ Semi-monocoque construction.

4 Primary fuselage structures of wood or metal planes are usually made up by what components? (1,00 P.)

- ☐ Covers, stringers and forming parts
- ☑ Frames and stringer
- ☐ Girders, rips and stringers
- ☐ Rips, frames and covers

5 A construction made of frames and stringer with a supporting skin is called... (1,00 P.)

- ☐ Honeycomb structure.
- ☐ Wood- or mixed construction.
- ☑ Semi-monocoque construction.
- ☐ Grid construction.

6 What are the major components of an aircraft's tail? (1,00 P.)

- ☐ Rudder and ailerons
- ☐ Steering wheel and pedals
- ☑ Horizontal tail and vertical tail
- ☐ Ailerons and elevator

7 The sandwich structure consists of two... (1,00 P.)

- ☐ thick layers and a light core material.
- ☐ thick layers and a heavy core material.
- ☑ thin layers and a light core material.
- ☐ thin layers and a heavy core material.

8 Which constructional elements give the wing its profile shape? (1,00 P.)

- ☑ Rips
- ☐ Planking
- ☐ Tip
- ☐ Spar

9 The load factor "n" describes the relationship between... (1,00 P.)

- ☐ weight and thrust.
- ☐ drag and lift.
- ☑ lift and weight.

- ☐ thrust and drag.

10 Which are the advantages of sandwich structures? (1,00 P.)

- ☑ Low weight, high stiffness, high stability, and high strength
- ☐ High temperature durability and low weight
- ☐ High strength and good formability
- ☐ Good formability and high temperature durability

11 Which of the stated materials shows the highest strength? (1,00 P.)

- ☐ Magnesium
- ☑ Carbon fiber re-inforced plastic
- ☐ Aluminium
- ☐ Wood

12 A glider's trim lever is used to... (1,00 P.)

- ☑ reduce stick force on the elevator.
- ☐ reduce stick force on the ailerons.
- ☐ reduce stick force on the rudder.
- ☐ reduce the adverse yaw.

13 The fuselage structure may be damaged by... (1,00 P.)

- ☐ airspeed decreasing below a certain value.
- ☐ neutralizing stick forces according to actual flight state.
- ☑ exceeding the manoeuvering speed in heavy gusts.
- ☐ stall after exceeding the maximum angle of attack.

14 About how many axes does an aircraft move and how are these axes called? (1,00 P.)

- ☑ 3; vertical axis, lateral axis, longitudinal axis
- ☐ 4; vertical axis, lateral axis, longitudinal axis, axis of speed
- ☐ 3; x-axis, y-axis, z-axis
- ☐ 4; optical axis, imaginary axis, sagged axis, axis of evil

15 A movement around the longitudinal axis is primarily initiated by the... (1,00 P.)

- ☐ elevator.
- ☑ ailerons.
- ☐ trim tab.
- ☐ rudder.

16 How are the flight controls on a small single-engine piston aircraft normally controlled and actuated? (1,00 P.)

- ☑ Manually through rods and control cables
- ☐ Hydraulically through hydraulic pumps and actuators
- ☐ Electrically through fly-by-wire
- ☐ Power-assisted through hydraulic pumps or electric motors

17 What are the primary and the secondary effects of a rudder input to the left? (1,00 P.)

- ☐ Primary: yaw to the right
  Secondary: roll to the left
- ☑ Primary: yaw to the left
  Secondary: roll to the left
- ☐ Primary: yaw to the right
  Secondary: roll to the right
- ☐ Primary: yaw to the left
  Secondary: roll to the right

18 What is the effect of pulling the control yoke or stick backwards? (1,00 P.)

- ☐ The aircraft's tail will produce an decreased upward force, causing the aircraft's nose to drop
- ☐ The aircraft's tail will produce an increased upward force, causing the aircraft's nose to rise
- ☐ The aircraft's tail will produce an increased downward force, causing the aircraft's nose to drop
- ☑ The aircraft's tail will produce an increased downward force, causing the aircraft's nose to rise

19 Which of the following options states all primary flight controls of an aircraft? (1,00 P.)

- ☐ Flaps, slats, speedbrakes
- ☐ Elevator, rudder, aileron, trim tabs, high-lift wing devices, power controls
- ☑ Elevator, rudder, aileron
- ☐ All movable parts on the aircraft which aid in controlling the aircraft

20 What is the purpose of the secondary flight controls? (1,00 P.)

- ☑ To improve the performance characteristics of an aircraft and relieve the pilot of excessive control forces
- ☐ To improve the turn characteristics of an aircraft in the low speed regime during approach and landing
- ☐ To enable the pilot to control the aircraft's movements about its three axes
- ☐ To constitute a backup system for the primary flight controls

21 The trim wheel or lever in the cockpit is moved aft by the pilot.

What effect does this action have on the trim tab and on the elevator? (1,00 P.)

- ☐ The trim tab moves up, the elevator moves down
- ☑ The trim tab moves down, the elevator moves up
- ☐ The trim tab moves up, the elevator moves up
- ☐ The trim tab moves down, the elevator moves down

22 When trimming an aircraft nose up, in which direction does the trim tab move? (1,00 P.)

- ☑ It moves down
- ☐ In direction of rudder deflection
- ☐ It moves up
- ☐ Depends on CG position

23 The trim is used to... (1,00 P.)

- ☑ adapt the control force.
- ☐ increase adverse yaw.
- ☐ move the centre of gravity.
- ☐ lock control elements.

24 The Pitot / static system is required to... (1,00 P.)

- ☐ prevent potential static buildup on the aircraft.
- ☑ measure total and static air pressure.
- ☐ prevent icing of the Pitot tube.
- ☐ correct the reading of the airspeed indicator to zero when the aircraft is static on the ground.

25 Which pressure is sensed by the Pitot tube? (1,00 P.)

- ☐ Dynamic air pressure
- ☐ Cabin air pressure
- ☑ Total air pressure
- ☐ Static air pressure

26 QFE is the... (1,00 P.)

- ☐ altitude above the reference pressure level 1013.25 hPa.
- ☐ magnetic bearing to a station.
- ☐ barometric pressure adjusted to sea level, using the international standard atmosphere (ISA).
- ☑ barometric pressure at a reference datum, typically the runway threshold of an airfield.

27 Which is the purpose of the altimeter subscale? (1,00 P.)

- ☐ To correct the altimeter reading for system errors
- ☑ To reference the altimeter reading to a predetermined level such as mean sea level, aerodrome level or pressure level 1013.25 hPa
- ☐ To set the reference level for the altitude decoder of the transponder
- ☐ To adjust the altimeter reading for non-standard temperature

28 In which way may an altimeter subscale which is set to an incorrect QNH lead to an incorrect altimeter reading? (1,00 P.)

- ☑ If the subscale is set to a higher than actual pressure, the indication is too high. This may lead to much closer proximity to the ground than intended
- ☐ If the subscale is set to a lower than actual pressure, the indication is too low. This may lead to much closer proximity to the ground than intended
- ☐ If the subscale is set to a higher than actual pressure, the indication is too low. This may lead to much greater heights above the ground than intended
- ☐ If the subscale is set to a lower than actual pressure, the indication is too high. This may lead to much closer proximity to the ground than intended

29 Lower-than-standard temperature may lead to... (1,00 P.)

- ☑ an altitude indication which is too high.
- ☐ an altitude indication which is too low.
- ☐ a correct altitude indication as long as the altimeter subscale is set to correct for non-standard temperature.
- ☐ a blockage of the Pitot tube by ice, freezing the altimeter indication to its present value.

30 A flight level is a... (1,00 P.)

- ☐ true altitude.
- ☐ altitude above ground.
- ☐ density altitude.
- ☑ pressure altitude.

31 A true altitude is... (1,00 P.)

- ☐ a height above ground level corrected for non-standard temperature.
- ☐ a height above ground level corrected for non-standard pressure.
- ☑ an altitude above mean sea level corrected for non-standard temperature.
- ☐ a pressure altitude corrected for non-standard temperature.

32 During a flight in colder-than-ISA air the indicated altitude is... (1,00 P.)

- ☑ higher than the true altitude.
- ☐ eqal to the true altitude.
- ☐ equal to the standard altitude.
- ☐ lower than the true altitude.

33 During a flight in an air mass with a temperature equal to ISA and the QNH set correctly,
the indicated altitude is... (1,00 P.)

- ☐ lower than the true altitude.
- ☐ equal to the standard atmosphere.
- ☐ higher than the true altitude.
- ☑ equal to the true altitude.

34 Which instrument can be affected by the hysteresis error? (1,00 P.)

- ☐ Direct reading compass
- ☐ Tachometer
- ☐ Vertical speed indicator
- ☑ Altimeter

35 The measurement of altitude is based on the change of the... (1,00 P.)

- ☑ static pressure.
- ☐ dynamic pressure.
- ☐ total pressure.
- ☐ differential pressure.

36 Which of the following options states the working principle of a vertical speed indicator? (1,00 P.)

- ☑ Measuring the present static air pressure and comparing it to the static air pressure inside a reservoir
- ☐ Measuring the vertical acceleration through the displacement of a gimbal-mounted mass
- ☐ Total air pressure is measured and compared to static pressure
- ☐ Static air pressure is measured and compared against a vacuum

37 The vertical speed indicator measures the difference of pressure between... (1,00 P.)

- ☐ the present dynamic pressure and the dynamic pressure of a previous moment.
- ☐ the present total pressure and the total pressure of a previous moment.
- ☐ the present dynamic pressure and the static pressure of a previous moment.
- ☑ the present static pressure and the static pressure of a previous moment.

38 An aircraft cruises on a heading of 180° with a true airspeed of 100 kt. The wind comes from 180° with 30 kt.

Neglecting instrument and position errors, which will be the approximate reading of the airspeed indicator? (1,00 P.)

- ☐ 130 kt
- ☑ 100 kt
- ☐ 30 kt
- ☐ 70 kt

39 Which of the following states the working principle of an airspeed indicator? (1,00 P.)

- ☐ Dynamic air pressure is measured by the Pitot tube and converted into a speed indication by the airspeed indicator
- ☐ Total air pressure is measured by the static ports and converted into a speed indication by the airspeed indicator
- ☑ Total air pressure is measured and compared against static air pressure.
- ☐ Static air pressure is measured and compared against a vacuum.

40 What values are usually marked with a red line on instrument displays? (1,00 P.)

- ☑ Operational limits
- ☐ Caution areas
- ☐ Operational areas
- ☐ Recommended areas

41 What is necessary for the determination of speed (IAS) by the airspeed indicator? (1,00 P.)

- ☐ The difference between the total pressure and the dynamic pressure
- ☐ The difference between the dynamic pressure and the static pressure
- ☐ The difference between the standard pressure and the total pressure
- ☑ The difference betweeen the total pressure and the static presssure

42 What is the meaning of the red range on the airspeed indicator? (1,00 P.)

- ☑ Speed which must not be exceeded regardless of circumstances
- ☐ Speed which must not be exceeded within bumpy air
- ☐ Speed which must not be exceeded with flaps extended
- ☐ Speed which must not be exceeded in turns with more than 45° bank

43 The compass error caused by the aircraft's magnetic field is called... (1,00 P.)

- ☐ inclination.
- ☐ variation.
- ☑ deviation.
- ☐ declination.

44 The indication of a magnetic compass deviates from magnetic north direction due to what errors? (1,00 P.)

- ☐ Inclination and declination of the earth's magnetic field
- ☐ Gravity and magnetism
- ☑ Deviation, turning and acceleration errors
- ☐ Variation, turning and acceleration errors

45 Which of the mentioned cockpit instruments is connected to the pitot tube? (1,00 P.)

- ☐ Direct-reading compass
- ☐ Altimeter
- ☐ Vertical speed indicator
- ☑ Airspeed indicator

46 An aircraft in the northern hemisphere intends to turn on the shortest way from a heading of 270° to a heading of 360°.

At approximately which indication of the magnetic compass should the turn be terminated? (1,00 P.)

- ☐ 270°
- ☐ 030°
- ☐ 360°
- ☑ 330°

47 Which cockpit instruments are connected to the static port? (1,00 P.)

- ☐ Airspeed indicator, direct-reading compass, slip indicator
- ☐ Airspeed indicator, altimeter, direct-reading compass
- ☐ Altimeter, slip indicator, navigational computer
- ☑ Altimeter, vertical speed indicator, airspeed indicator

48 An aircraft in the northern hemisphere intends to turn on the shortest way from a heading of 360° to a heading of 270°.

At approximately which indication of the magnetic compass should the turn be terminated? (1,00 P.)

- ☐ 360°
- ☑ 270°
- ☐ 240°
- ☐ 300°

49 The term "static pressure" is defined as pressure... (1,00 P.)

- ☐ inside the airplane cabin.
- ☑ of undisturbed airflow.
- ☐ resulting from orderly flow of air particles.
- ☐ sensed by the pitot tube.

50 An aircraft in the northern hemisphere intends to turn on the shortest way from a heading of 030° to a heading of 180°.

At approximately which indicated magnetic heading should the turn be terminated? (1,00 P.)

- ☐ 150°.
- ☐ 180°.
- ☐ 360°.
- ☑ 210°.

51 What does the dynamic pressure depend directly on? (1,00 P.)

- ☐ Lift- and drag coefficient
- ☑ Air density and airflow speed squared
- ☐ Air density and lift coefficient
- ☐ Air pressure and air temperature

52 What is a cause for the dip error on the direct-reading compass? (1,00 P.)

- ☐ Acceleration of the airplane
- ☐ Temperature variations
- ☐ Deviation in the cockpit
- ☑ Inclination of earth's magnetic field lines

53 The airspeed indicator is unservicable.

The airplane may only be operated... (1,00 P.)

- ☐ if no maintenance organisation is around.
- ☐ if only airfield patterns are flown.
- ☑ when the airspeed indicator is fully functional again.
- ☐ when a GPS with speed indication is used during flight.

54 The Caution Area is marked on an airspeed indicator by what color? (1,00 P.)

- ☐ Red
- ☐ Green
- ☐ White
- ☑ Yellow

55 What difference in altitude is shown by an altimeter, if the reference pressure scale setting is changed from 1000 hPa to 1010 hPa? (1,00 P.)

- ☐ Zero
- ☐ 80 m less than before
- ☑ 80 m more than before
- ☐ Values depending on QNH

56 When is it necessary to adjust the pressure in the reference scale of an alitimeter? (1,00 P.)

- ☐ After maintance has been finished
- ☐ Every day before the first flight
- ☐ Once a month before flight operation
- ☑ Before every flight and during cross country flights

57 The altimeter's reference scale is set to airfield pressure (QFE).

What indication is shown during the flight? (1,00 P.)

- ☐ Altitude above MSL
- ☑ Height above airfield
- ☐ Airfield elevation
- ☐ Pressure altitude

58 A vertical speed indicator connected to a too big equalizing tank results in... (1,00 P.)

- ☐ mechanical overload
- ☐ no indication
- ☐ indication too low
- ☑ indication too high

59 A vertical speed indicator measures the difference between... (1,00 P.)

- ☐ total pressure and static pressure.
- ☐ dynamic pressure and total pressure.
- ☑ instantaneous static pressure and previous static pressure.
- ☐ instantaneous total pressure and previous total pressure.

60 An energy-compensated vertical speed inicator (VSI) shows during stationary glide the vertical speed... (1,00 P.)

- ☐ of the glider through surrounding air.
- ☑ of the airmass flown through.
- ☐ of the glider plus movement of the air.
- ☐ of the glider minus movement of the air.

61 The term "inclination" is defined as... (1,00 P.)

- ☐ deviation induced by electrical fields.
- ☐ angle between magnetic and true north.
- ☑ angle between earth's magnetic field lines and horizontal plane.
- ☐ angle between airplane's longitudinal axis and true north.

62 During a right turn, the yaw string is drawn to the left from center position.

By what rudder input can the string be centered again? (1,00 P.)

- ☐ Less bank, less rudder in turn direction
- ☑ Less bank, more rudder in turn direction
- ☐ More bank, less rudder in turn direction
- ☐ More bank, more rudder in turn direction

63 During a left turn, the yaw string is drawn to the left from center position.

By what rudder input can the string be centered again? (1,00 P.)

- ☑ More bank, less rudder in turn direction
- ☐ Less bank, more rudder in turn direction
- ☐ Less bank, less rudder in turn direction
- ☐ More bank, more rudder in turn direction

64 What kind of defect results in loss of airworthiness of an airplane? (1,00 P.)

- ☐ Dirty wing leading edge
- ☐ Crack in the cabin hood plastic
- ☐ Scratch on the outer painting
- ☑ Damage to load-bearing parts

65 The mass loaded on the plane is lower than the minimum load required by the load sheet.

What action has to be taken? (1,00 P.)

- ☐ Trim aircraft to "pitch down"
- ☐ Change pilot seat position
- ☐ Change incident angle of elevator
- ☑ Load ballast weight up to minimum load

66 Water ballast increases wing load by 40%.

By what percentage does the minimum speed of the glider plane increase? (1,00 P.)

- ☐ 100%
- ☐ 40%
- ☐ 200%
- ☑ 18%

67 The maximium load according load sheet has been exceeded.

What action has to be taken? (1,00 P.)

- ☐ Increase speed by 15%
- ☑ Reduce load
- ☐ Trim "pitch-down"
- ☐ Trim "pitch-up"

68 With decreasing air density the airflow speed increases at stall speed (TAS) and vice verca.

How has a final approach to be conducted on a hot summer day? (1,00 P.)

- ☐ With increased speed indication (IAS)
- ☑ With unchanged speed indication (IAS)
- ☐ With decreased speed indication (IAS)
- ☐ With additional speed according POH

69 What is referred to as torsion-stiffed leading edge? (1,00 P.)

- ☐ The part of the main cross-beam to support torsion forces.
- ☐ Special shape of the leading edge.
- ☐ The point where the torsion moment on a wing begins to decrease.
- ☑ Both-side planked leading edge (from edge to cross-beam) to support torsion forces.

70 What is the purpose of winglets? (1,00 P.)

- ☐ To increase efficiency of aspect ratio.
- ☑ Reduction of induced drag.
- ☐ Increase gliging performance at high speed.
- ☐ Increase of lift and turning manoeuvering capabilities.

71 What engines are commonly used with Touring Motor Gliders (TMG)? (1,00 P.)

- ☐ 2 plate Wankel
- ☐ 2 Cylinder Diesel
- ☐ 4 Cylinder 2 stroke
- ☑ 4 Cylinder; 4 stroke

72 What is the meaning of the yellow arc on the airspeed indicator? (1,00 P.)

- ☐ Cautious use of flaps or brakes to avoid overload.
- ☐ Speed for best glide can be found in this area.
- ☑ Flight only in calm weather with no gusts to avoid overload.
- ☐ Optimum speed while being towed behind aircraft.

73 Airspeed indicator, altimeter and vertical speed indicator all show incorrect indications at the same time.

What error can be the cause? (1,00 P.)

- ☑ Blocking of static pressure lines.
- ☐ Leakage in compensation vessel.
- ☐ Blocking of pitot tube.
- ☐ Failure of the electrical system.

74 Information about maxmimum allowed airspeeds can be found where? (1,00 P.)

- ☐ airspeed indicator, cockpit panel and AIP part ENR
- ☐ POH, approach chart, vertical speed indicator
- ☐ POH and posting in briefing room
- ☑ POH, Cockpit panel, airspeed indicator