Examination Center DGAC

Examination Date ______________________

Name ______________________

Firstname ______________________

Birthday ______________________

1 The effect of wind on Rate of Climb (ROC) will be: (1.00 P.)

[A] The wind effect on ROC is unpredictable

[B] Headwind will increase the ROC

[C] Nil

[D] Tailwind will increase the ROC

2 Traffic load is the: (1.00 P.)

[A] Dry Operating Mass minus the disposable load.

[B] Dry Operating Mass minus the variable load.

[C] Zero Fuel Mass minus Dry Operating Mass.

[D] Take-off Mass minus Zero Fuel Mass.

3 The effect of wind on Angle of Climb Path will be: (1.00 P.)

[A] Head- and Tailwind will decrease the Angle of Climb Path

[B] The wind effect on Angle of Climb Path is unpredictable

[C] Headwind will increase the Angle of Climb Path

[D] Nil

4 The speed for maximum rate of climb: (1.00 P.)

[A] will be higher than the speed for best angle of climb.

[B] will be the same as the speed for best angle of climb under any circumstances.

[C] may be higher or lower than the speed for best angle of climb depending on helicopter type.

[D] lower than the speed for the best angle of climb.

5 The minimum rate of descent in autoration will occur: (1.00 P.)

[A] with best range speed and minimum rotor speed.

[B] with VNE power-off and minimum rotor speed.

[C] with VY and rotor speed within limits.

[D] with VTOSS and maximum rotor speed.

6 An operator shall ensure that the net take-off flight path clears all obstacles. The half-width of the obstacle-corridor at the distance D from the end of the TODA is at least: (1.00 P.)

[A] 90m + D/0.125

[B] 90m + 0.125D

[C] 90m + 1.125D

[D] 0.125D

7 In a power-off autorotation in still air, to obtain the maximum glide range, the helicopter should be flown: (1.00 P.)

[A] at a speed close to maximum endurance speed.

[B] at a speed close to the VNE.

[C] at a speed close to the best range speed and with minimum rotor speed without exceeding the VNE power-off.

[D] at a speed close to the VNE power-on.

8 In a power-off autorotation in still air, to obtain the minimum rate of descent, the helicopter should be flown: (1.00 P.)

[A] at a speed close to Zero.

[B] at a speed close to maximum range speed.

[C] at a speed close to the VY and with minimum rotor speed.

[D] at a speed close to the VNE.

9 Given the following information, calculate the loaded centre of gravity (cg).

STATION	MASS (kg)	ARM (cm)	MOMENT (kgcm)
Basic Empty Condition	12045	+30	+361350
Crew	145	-160	-23200
Freight 1	5455	+200	+1091000
Freight 2	410	-40	-16400
Fuel	6045	-8	-48360
Oil	124	+40	+4960 (1.00 P.)

[A] 60.16 cm aft datum.

[B] 56.35 cm aft datum.

[C] 53.35 cm aft datum.

[D] 56.53 cm aft datum.

10 The rate of climb will be negative affected by: (1.00 P.)

[A] high pressure altitude, turning flight, low temperature.

[B] high gross mass of helicopter, low temperature, high humidity.

[C] low pressure altitude, high mass, high temperature.

[D] high temperature, high pressure altitude, contaminated rotor blades.

11 What is the effect of tail wind on the time to climb to a given altitude? (1.00 P.)

[A] The effect on time to climb will depend on the aeroplane type.

[B] The time to climb increases.

[C] The time to climb does not change.

[D] The time to climb decreases.

12 Given are the following information at take-off

STATION	MASS (kg)	ARM (cm)	MOMENT (kgcm)
Basic Empty Condition	12 045	+30	+361 350
Crew	145	-160	-23 200
Freight 1	570	+200	+114 000
Freight 2	410	-40	-16 400
Fuel	6 045	-8	- 48 360

Given that the flight time is 2 hours and the estimated fuel flow will be 1050 litres per hour and the average oil consumption will be 2.25 litres per hour. The specific density of fuel is 0.79. The "Fright 2" will be dropped during flight within the scope of a rescue action.
Calculate the CG position at landing. (1.00 P.)

[A] 25 cm aft of datum.

[B] 27 cm aft of datum.

[C] 22 cm aft of datum.

[D] 24 cm aft of datum.

13 If a helicopter is flying horizontally at its service ceiling: (1.00 P.)

[A] The helicopter must be flown at Vmax.

[B] Vmin will coincide with Vmax.

[C] Its speed has to be maintained in a small range.
(Vmin is close to Vmax)

[D] The helicopter must be flown at Vmin.

14 A helicopter will obtain a maximum flight distance at the speed: (1.00 P.)

[A] for maximum endurance.

[B] the speed for minimum power required.

[C] for minimum hourly fuel flow.

[D] for maximum range.

15 The angle of climb with flaps extended, compared to that with flaps retracted, will normally be: (1.00 P.)

[A] Larger.

[B] Not change.

[C] Smaller.

[D] Increase at moderate flap setting, decrease at large flap setting.

16 Maximum range for a helicopter: (1.00 P.)

[A] will be obtained at sea level.

[B] will be obtained at the optimum altitude.

[C] will be obtained at the absolute ceiling.

[D] is independent of altitude.

17 Vx and Vy with take-off flaps will be: (1.00 P.)

[A] changed so that Vx increases and Vy decreases compared to clean configuration.

[B] higher than that for clean configuration.

[C] lower than that for clean configuration.

[D] same as that for clean configuration.

18 Given that the total mass of an aeroplane is 112 000 kg with a centre of gravity position at 22.62m aft of the datum. The centre of gravity limits are between 18m and 22m. How much mass must be removed from the rear hold (30 m aft of the datum) to move the centre of gravity to the middle of the limits: (1.00 P.)

[A] 8 680 kg

[B] 29 344 kg

[C] 16 529 kg

[D] 43 120 kg

19 Other factors remaining constant, how does increasing altitude affect Vx and Vy in terms of TAS? (1.00 P.)

[A] Both will increase.

[B] Vx will decrease and Vy will increase.

[C] Both will remain the same.

[D] Both will decrease.

20 030-008.jpg
The total mass of an aeroplane is 145000 kg and the centre of gravity limits are between 4.7 m and 6.9 m aft of the datum. The loaded centre of gravity position is 4.4 m aft. How much mass must be transferred from the front to the rear hold in order to bring the out of limit centre of gravity position to the foremost limit: (1.00 P.)

Siehe Anlage 1

[A] 62 500 kg

[B] 7 500 kg

[C] 35 000 kg

[D] 3 500 kg

21 What determines the longitudinal stability of an aeroplane ? (1.00 P.)

[A] The effectiveness of the horizontal stabilizer, rudder and rudder trim tab.

[B] The dihedral, angle of sweepback and the keel effect.

[C] The relationship of thrust and lift to weight and drag.

[D] The location of the centre of gravity with respect to the neutral point.

22 How does TAS vary in a constant Mach climb in the troposphere (under ISA conditions) ? (1.00 P.)

[A] TAS is not related to Mach Number.

[B] TAS decreases.

[C] TAS is constant.

[D] TAS increases.

23 Assuming gross mass, altitude and airspeed remain unchanged, movement of the centre of gravity from the forward to the aft limit will cause (1.00 P.)

[A] increased cruise range.

[B] higher stall speed.

[C] reduced maximum cruise range.

[D] lower optimum cruising speed.

24 The optimum long-range cruise altitude for a turbojet aeroplane: (1.00 P.)

[A] is independent of the aeroplane mass.

[B] is always equal to the powerplant ceiling.

[C] increases when the aeroplane mass decreases.

[D] is only dependent on the outside air temperature.

25 While making mass and balance calculation for a particular aircraft, the term 'Basic Empty Mass' applies to the sum of airframe, engine(s), fixed ballast plus (1.00 P.)

[A] unusable fuel and full operating fluids.

[B] all the oil, fuel, and hydraulic fluid but not including crew and traffic load.

[C] all the oil and fuel.

[D] all the consumable fuel and oil, but not including any radio or navigation equipment installed by manufacturer.

26 Considering TAS for maximum range and maximum endurance, other factors remaining constant, (1.00 P.)

[A] both will decrease with increasing altitude.

[B] both will stay constant regardless of altitude.

[C] both will increase with increasing altitude.

[D] TAS for maximum range will increase with increased altitude while TAS for maximum endurance will decrease with increased altitude.

27 The term 'Maximum Zero Fuel Mass' consist of: (1.00 P.)

[A] The maximum permissible mass of an aeroplane with no usable fuel.

[B] The maximum mass for some aeroplanes including the fuel load and the traffic load

[C] The maximum mass authorized for a certain aeroplane not including traffic load and fuel load.

[D] The maximum mass authorized for a certain aeroplane not including the fuel load and operational items

28 How does the specific range change when the altitude increases for jet aeroplane flying with the speed for maximum range? (1.00 P.)

[A] Increases only if there is no wind.

[B] First increases than decreases.

[C] Decreases.

[D] Does not change.

29 The actual 'Zero Fuel Mass' is equal to the: (1.00 P.)

[A] Operating Mass plus all the traffic load.

[B] Dry Operating Mass plus the traffic load.

[C] Actual Landing Mass plus trip fuel.

[D] Basic Empty Mass plus the fuel loaded.

30 030-003.jpg
Assuming constant L/D ratio, which of the diagrams provided correctly shows the movement of the "Thrust Required Curve". Mass m1 is higher than mass m2.
(1.00 P.)

Siehe Anlage 2

[A] a

[B] b

[C] c

[D] d

31 The actual 'Take-off Mass' is equivalent to: (1.00 P.)

[A] Actual Zero Fuel Mass plus the traffic load

[B] Dry Operating Mass plus the take-off fuel

[C] Dry Operating Mass plus take-off fuel and the traffic load

[D] Actual Landing Mass plus the take-off fuel

32 Long range cruise is a flight procedure which gives: (1.00 P.)

[A] a specific range which is approximately 99% of maximum specific range and a higher cruise speed.

[B] a specific range which is approximately 99% of maximum specific range and a lower cruise speed.

[C] a 1% higher TAS for maximum specific range.

[D] an IAS which is 1% higher than the IAS for maximum specific range.

33 Calculate the centre of gravity in % MAC (mean aerodynamic chord) with following data:
Distance datum - centre of gravity: 12.53 m
Distance datum - leading edge: 9.63 m
Length of MAC: 8 m (1.00 P.)

[A] 36.3 % MAC

[B] 63.4 % MAC

[C] 47.0 % MAC

[D] 23.1 % MAC

34 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: (1.00 P.)

[A] the long range speed.

[B] the speed corresponding to the maximum value of the lift / drag ratio.

[C] the speed at the maximum lift.

[D] the speed corresponding to the minimum value of (lift / drag)^3/2.

35 Given : Actual mass 116.500 lbs
Original cg station 435.0
Compartment A station 285.5
Compartment B station 792.5
If 390 lbs of cargo are moved from compartment B (aft) to compartment A (forward), what is the station number of the new centre of gravity (cg). (1.00 P.)

[A] 436.7

[B] 506.3

[C] 463.7

[D] 433.3

36 A commercial flight is planned with a turbojet aeroplane to an aerodrome with a landing distance available of 2400 m. The aeroplane mass must be such that on arrival the aeroplane can be landed within: (1.00 P.)

[A] 1 090 m.

[B] 1 250 m.

[C] 1 655 m.

[D] 1 440 m.

37 033-033.jpg
With respect to multi-engine piston powered aeroplane, determine the ramp mass (lbs) in the following conditions:
Basic empty mass: 3 210 lbs
Basic arm: 88.5 Inches
One pilot: 160 lbs
Front seat passenger: 200 lbs
Centre seat passengers: 290 lbs
One passenger rear seat: 110 lbs
Baggage in zone 1: 100 lbs
Baggage in zone 4: 50 lbs
Block fuel: 100 US Gal.
Trip fuel: 55 US Gal.
Fuel for start up and taxi (included in block fuel): 3 US Gal.
Fuel density: 6 lbs/US Gal. (1.00 P.)

Siehe Anlage 3

[A] 4 390

[B] 4 120

[C] 4 372

[D] 4 720

38 At the destination aerodrome the landing distance available is 3000m. The appropriate weather forecast indicates that the runway at the estimated time of arrival will be wet. For a commercial flight the mass of a turbojet aeroplane at landing must be such that the aeroplane can be landed within: (1.00 P.)

[A] 2 070 m.

[B] 1800 m.

[C] 1565 m.

[D] 2609 m.

39 033-034.jpg

With respect to multi-engine piston powered aeroplane, determine the block fuel moment (lbs.In.) in the following conditions:

Basic empty mass: 3 210 lbs.
One pilot: 160 lbs.
Front seat passenger: 200 lbs.
Centre seat passengers: 290 lbs. (total)
One passenger rear seat: 110 lbs.
Baggage in zone 1: 100 lbs.
Baggage in zone 4: 50 lbs.
Block fuel: 100 US Gal.
Trip fuel: 55 US Gal.
Fuel for start up and taxi (included in block fuel): 3 US Gal.
Fuel density: 6 lbs./US Gal. (1.00 P.)

Siehe Anlage 4

[A] 56 160

[B] 30 888

[C] 9 360

[D] 433 906

40 With zero wind, the angle of attack for maximum range for an aeroplane with turbojet engines is: (1.00 P.)

[A] equal to the angle of attack corresponding to maximum endurance

[B] equal to the angle of attack corresponding to maximum lift to drag ratio.

[C] lower than the angle of attack corresponding to maximum endurance

[D] equal to the angle of attack corresponding to zero induced drag.

41 Two identical turbojet aeroplane (whose specific fuel consumptions are considered to be equal) are at holding speed at the same altitude.
The mass of the first aircraft is 130 000 kg and its hourly fuel consumption is 4300 kg/h. The mass of the second aircraft is 115 000 kg and its hourly fuel consumption is: (1.00 P.)

[A] 3804 kg/h.

[B] 3365 kg/h.

[C] 4044 kg/h.

[D] 3578 kg/h.

42 033-035.jpg

With respect to a multi-engine piston powered aeroplane, determine the total moment (lbs.In) at landing in the following conditions:

Basic empty mass: 3 210 lbs.
One pilot: 160 lbs.
Front seat passenger: 200 lbs.
Centre seat passengers: 290 lbs. (total)
One passenger rear seat: 110 lbs.
Baggage in zone 1: 100 lbs.
Baggage in zone 4: 50 lbs.
Block fuel: 100 US Gal.
Trip fuel: 55 US Gal.
Fuel for start up and taxi (included in block fuel): 3 US Gal.
Fuel density: 6 lbs./US Gal.
Total moment at take-off: 432226 lbs.In (1.00 P.)

Siehe Anlage 5

[A] 432 221

[B] 433 906

[C] 401 338

[D] 377 746

43 A jet aeroplane equipped with old engines has a specific fuel consumption of 0.06 kg per Newton of thrust and per hour and, in a given flying condition, a fuel consumption of 14 kg per NM. In the same flying conditions, the same aeroplane equipped with modern engines with a specific fuel consumption of 0.035 kg per Newton of thrust and per hour, has a fuel consumption per NM of: (1.00 P.)

[A] 14 kg/NM.

[B] 10.7 kg/NM.

[C] 11.7 kg/NM.

[D] 8.17 kg/NM.

44 033-035.jpg
With respect to a multi-engine piston powered aeroplane, determine the CG location at take off in the following conditions:
Basic empty mass: 3 210 lbs.
One pilot: 160 lbs.
Front seat passenger: 200 lbs.
Centre seat passengers: 290 lbs. (total)
One passenger rear seat: 110 lbs.
Baggage in zone 1: 100 lbs.
Baggage in zone 4: 50 lbs.
Zero Fuel Mass: 4210 lbs.
Moment at Zero Fuel Mass: 377751 lbs.In
Block fuel: 100 US Gal.
Trip fuel: 55 US Gal.
Fuel for start up and taxi (included in block fuel): 3 US Gal.
Fuel density: 6 lbs./US Gal. (1.00 P.)

Siehe Anlage 6

[A] 91.69 inches aft of datum

[B] 93.60 inches aft of datum

[C] 91.92 inches aft of datum

[D] 91.84 inches aft of datum

45 The determination of the maximum mass on brake release, of a certified turbojet aeroplane with 5°, 15° and 25° flaps angles on take-off, leads to the following values:

Flap angle:	5°	15°	25°
Runway limitation (kg):	66 000	69 500	71 500
2nd segment climb limitation:	72 200	69 000	61 800

Wind correction:

Head wind:+120kg / kt

Tail wind: -360kg / kt

Given that the tail wind component is equal to 5 kt, the maximum mass on brake release and corresponding flap angle will be: (1.00 P.)

[A] 67 700 kg / 15 deg

[B] 69 700 kg / 25 deg

[C] 72 200 kg / 5 deg

[D] 69 000 kg / 15 deg

46 033-038.jpg
With respect to a single-engine piston powered aeroplane, determine the zero fuel moment (lbs.In./100) in the following conditions:
Basic Empty Mass: 2415 lbs.
Arm at Basic Empty Mass: 77,9 In.
Cargo Zone A: 350 lbs.
Baggage Zone B: 35 lbs.
Pilot and front seat passenger: 300 lbs (total) (1.00 P.)

Siehe Anlage 7

[A] 2548,8

[B] 6675

[C] 2496,3

[D] 2311,8

47 Determine the Zero Fuel Mass for the following single engine aeroplane.

Given :
Basic Empty Mass: 1799 lbs
Optional Equipment: 35 lbs
Pilot + Front seat passenger: 300 lbs
Cargo Mass: 350 lbs
Ramp Fuel = Block Fuel: 60 Gal.
Trip Fuel: 35 Gal.
Fuel density: 6 lbs/Gal. (1.00 P.)

[A] 2589 lbs

[B] 2449 lbs

[C] 2414 lbs

[D] 2659 lbs

48 The correct formula is:
(Remark: "<=" means "equal to or lower") (1.00 P.)

[A] V2min<= VEF<= VMU

[B] 1.05 VMCA<= VEF<= V1

[C] VMCG<=VEF < V1

[D] 1.05 VMCG< VEF<= VR

49 Given:

Standard Empty Mass	1764 lbs
Optional Equipment	35 lbs
Pilot + Passenger	300 lbs
Cargo	350 lbs
Ramp Fuel (Block Fuel)	60 Gal
Trip Fuel	35 Gal
Taxi Fuel	1.7 Gal
Final Reserve Fuel	18 Gal
Fuel density	6 lbs/Gal

Determine the expected landing mass. (1.00 P.)

[A] 2589 lbs

[B] 2599 lbs

[C] 2557 lbs

[D] 2472 lbs

50 Given:
VS= Stalling speed
VMCA= Air minimum control speed
VMU= Minimum unstick speed (disregarding engine failure)
V1= take-off decision speed
VR= Rotation speed
V2 min.= Minimum take-off safety speed
VLOF: Lift-off speed
The correct formula is: (1.00 P.)

[A] VR< VMCA< VLOF

[B] V2min< VMCA> VMU

[C] VS< VMCA< V2 min

[D] VMU<= VMCA< V1

51 Determine the Take-off Mass for the following single engine aeroplane.

Given:

Standard Empty Mass	1764 lbs
Optional Equipment	35 lbs
Pilot + Front seat passenger	300 lbs
Cargo Mass	350 lbs
Ramp Fuel = Block Fuel	60 Gal.
Trip Fuel	35 Gal.
Fuel density	6 lbs/Gal. (1.00 P.)

[A] 2659 lbs

[B] 2799 lbs

[C] 2764 lbs

[D] 2809 lbs

52 Regarding take-off, the take-off decision speed V1: (1.00 P.)

[A] is an airspeed at which the aeroplane is airborne but below 35 ft and the pilot is assumed to have made a decision to continue or discontinue the take-off .

[B] is always equal to VEF (Engine Failure speed).

[C] is the airspeed of the aeroplane upon reaching 35 feet above the take-off surface.

[D] is the airspeed on the ground at which the pilot is assumed to have made a decision to continue or discontinue the take-off.

53 The maximum zero fuel mass is a mass limitation for the: (1.00 P.)

[A] total load of the fuel imposed upon the wing

[B] allowable load exerted upon the wing considering a margin for fuel tanking

[C] strength of the fuselage

[D] strength of the wing root

54 During certification test flights for a turbojet aeroplane, the actual measured take-off runs from brake release to a point equidistant between the point at which VLOF is reached and the point at which the aeroplane is 35 feet above the take-off surface are:
- 1747 m, all engines operating
- 1950 m, with the critical engine failure recognized at V1, the other factors remaining unchanged.
Considering both possibilities to determine the take-off run (TOR). What is the correct distance? (1.00 P.)

[A] 1950 m.

[B] 2096 m.

[C] 2009 m.

[D] 2243 m.

55 With respect to aeroplane loading in the planning phase, which of the following statements is always correct ?
LM = Landing Mass
TOM = Take-off Mass
MTOM = Maximum Take-off Mass
ZFM = Zero Fuel Mass
MZFM = Maximum Zero Fuel Mass
DOM = Dry Operating Mass (1.00 P.)

[A] LM = TOM - Trip Fuel

[B] Reserve Fuel = TOM - Trip Fuel

[C] MTOM = ZFM + maximum full tank fuel mass

[D] MZFM = Traffic load + DOM

56 An airport has a 3000 metres long runway, and a 2000 metres clearway at each end of that runway. For the calculation of the maximum allowed take-off mass, the take-off distance available cannot be greater than: (1.00 P.)

[A] 4500 metres.

[B] 6000 metres.

[C] 4000 metres.

[D] 5000 metres.

57 The lowest take-off safety speed (V2 min) is: (1.00 P.)

[A] 1.20 VSR for all aeroplanes.

[B] 1.13 VSR for two- and three-engine turbo-propeller and turbojet aeroplanes.

[C] 1.15 VSR for all turbojet and turbo-propeller aeroplanes.

[D] 1.20 VSR for all turbo-propeller aeroplanes.

58 Which of the following statements is correct? (1.00 P.)

[A] The centre of gravity is given in percent of MAC calculated from the leading edge of the wing, where MAC always = the wing chord halfway between the centre line of the fuselage and the wing tip

[B] A tail heavy aeroplane is less stable and stalls at a lower speed than a nose heavy aeroplane

[C] The station (STA) is always the location of the centre of gravity in relation to a reference point, normally the leading edge of the wing at MAC

[D] If the actual centre of gravity is located behind the aft limit the aeroplane longitudinal stability increases.

59 The net flight path gradient after take-off compared to the actual climb gradient is: (1.00 P.)

[A] larger.

[B] depends on type of aircraft and may be smaller or larger respectively.

[C] equal.

[D] smaller.

60 Which of the following statements is correct? (1.00 P.)

[A] The lowest stalling speed is obtained if the actual centre of gravity is located in the middle between the aft and forward limit of centre of gravity

[B] If the actual centre of gravity is located behind the aft limit of centre of gravity it is possible that the aeroplane will be unstable, making it necessary to increase elevator forces

[C] A tail heavy aeroplane is less stable and stalls at a lower speed than a nose heavy aeroplane

[D] If the actual centre of gravity is close to the forward limit of the centre of gravity the aeroplane may be unstable, making it necessary to increase elevator forces

61 Which of the following three speeds of a jet aeroplane are basically identical?
The speeds for: (1.00 P.)

[A] maximum climb angle, minimum glide angle and maximum range.

[B] maximum drag, maximum endurance and maximum climb angle.

[C] holding, maximum climb angle and minimum glide angle.

[D] maximum range, minimum drag and minimum glide angle.

62 Which of the following statements is correct? (1.00 P.)

[A] The Maximum Zero Fuel Mass ensures that the centre of gravity remains within limits after the uplift of fuel.

[B] The Basic Empty Mass is equal to the mass of the aeroplane excluding traffic load and useable fuel but including the crew.

[C] The Maximum Landing Mass of an aeroplane is restricted by structural limitations, performance limitations and the strength of the runway.

[D] The Maximum Take-off Mass is equal to the maximum mass when leaving the ramp.

63 The lift coefficient decreases during a glide with constant Mach number, mainly because the: (1.00 P.)

[A] IAS increases.

[B] TAS decreases.

[C] glide angle increases.

[D] aircraft mass decreases.

64 Given an aeroplane with:
Maximum Structural Landing Mass: 68000 kg
Maximum Zero Fuel Mass: 70200 kg
Maximum Structural Take-off Mass: 78200 kg
Dry Operating Mass: 48000 kg
Scheduled trip fuel is 7000 kg and the reserve fuel is 2800 kg,

Assuming performance limitations are not restricting, the maximum permitted take-off mass and maximum traffic load are respectively: (1.00 P.)

[A] 75000 kg and 20000 kg

[B] 75000 kg and 17200 kg

[C] 77200 kg and 19400 kg

[D] 77200 kg and 22200 kg

65 030-005.jpg
Which of the following diagrams correctly shows the movement of the power required curve with increasing altitude .(H1 < H2) (1.00 P.)

Siehe Anlage 8

[A] Figure d

[B] Figure c

[C] Figure b

[D] Figure a

66 Given an aeroplane with:
Maximum Structural Landing Mass: 125000 kg
Maximum Zero Fuel Mass: 108500 kg
Maximum Structural Take-off Mass: 155000 kg
Dry Operating Mass: 82000 kg
Scheduled trip fuel is 17000 kg and the reserve fuel is 5000 kg.

Assuming performance limitations are not restricting, the maximum permitted take-off mass and maximum traffic load are respectively: (1.00 P.)

[A] 130500 kg and 31500 kg

[B] 125500 kg and 21500 kg

[C] 130500 kg and 26500 kg

[D] 125500 kg and 26500 kg

67 For the purpose of completing the Mass and Balance documentation, the Traffic Load is considered to be equal to the Take-off Mass (1.00 P.)

[A] less the Operating Mass.

[B] plus the Trip Fuel Mass.

[C] plus the Operating Mass.

[D] less the Trip Fuel Mass.

68 An aeroplane is in a power off glide at speed for minimum glide angle. If the pilot increases pitch attitude the glide distance: (1.00 P.)

[A] may increase or decrease depending on the type of aeroplane.

[B] decreases.

[C] remains the same.

[D] increases.

69 For the purpose of completing the Mass and Balance documentation, the Operating Mass is considered to be Dry Operating Mass plus (1.00 P.)

[A] Ramp Fuel Mass less the fuel for APU and run-up.

[B] Ramp (Block) Fuel Mass.

[C] Take-off Fuel Mass.

[D] Trip Fuel Mass.

70 When establishing the mass breakdown of an aeroplane, the empty mass is defined as the sum of the: (1.00 P.)

[A] standard empty mass plus specific equipment mass plus trapped fluids plus unusable fuel mass

[B] basic mass plus special equipment mass

[C] basic mass plus variable equipment mass

[D] empty mass dry plus variable equipment mass

71 Maximum endurance for a piston engine aeroplane is achieved at: (1.00 P.)

[A] The speed that approximately corresponds to the maximum rate of climb speed.

[B] The speed for minimum drag.

[C] The speed that corresponds to the speed for maximum climb angle.

[D] The speed for maximum lift coefficient.

72 For the purpose of completing the Mass and Balance documentation, the Dry Operating Mass is defined as: (1.00 P.)

[A] The total mass of the aircraft ready for a specific type of operation excluding all usable fuel.

[B] The total mass of the aircraft ready for a specific type of operation excluding all usable fuel and traffic load.

[C] The total mass of the aircraft ready for a specific type of operation excluding all traffic load.

[D] The total mass of the aircraft ready for a specific type of operation excluding crew and crew baggage.

73 The maximum indicated air speed of a piston engine aeroplane without turbo charger, in level flight, is reached: (1.00 P.)

[A] at the optimum cruise altitude.

[B] at the practical ceiling.

[C] at the lowest possible altitude.

[D] at the service ceiling.

74 During a descent at constant Mach Number, the margin to low speed buffet will: (1.00 P.)

[A] remain constant, because the Mach number remains constant.

[B] increase, because the lift coefficient decreases.

[C] increase, because the lift coefficient increases.

[D] decrease, because the lift coefficient decreases.

75 In calculations with respect to the position of the centre of gravity a reference is made to a datum. The datum is (1.00 P.)

[A] calculated from the data derived from the weighing procedure carried out on the aircraft after any major modification.

[B] an arbitrary reference chosen by the pilot which can be located anywhere on the aircraft.

[C] calculated from the loading manifest.

[D] a reference plane which is chosen by the aircraft manufacturer. Its position is given in the aircraft Flight or Loading Manual.

76 The datum is a reference from which all moment (balance) arms are measured. Its precise position is given in the control and loading manual and it is located (1.00 P.)

[A] at a convenient point which may not physically be on the aircraft.

[B] at or near the focal point of the aircraft axis system.

[C] at or near the forward limit of the centre of gravity.

[D] at or near the natural balance point of the empty aircraft.

77 030-006.jpg
With regard to the graph for landing performance, what is the minimum headwind component required in order to land at Mombasa airport?
Given:
Runway length: 1300 ft, Runway elevation: MSL
Weather: assume ISA conditions
Mass: 3200 lbs
Obstacle height: 50 ft (1.00 P.)

Siehe Anlage 9

[A] 5 kt.

[B] No wind.

[C] 15 kt.

[D] 10 kt.

78 A jet aeroplane is climbing at a constant IAS and maximum climb thrust, how will the climb angle / the pitch angle change? (1.00 P.)

[A] Remain constant / become larger.

[B] Remain constant / decrease.

[C] Reduce / decrease.

[D] Reduce / remain constant.

79 Moment (balance) arms are measured from a specific point to the body station at which the mass is located. That point is known as (1.00 P.)

[A] the axis.

[B] the focal point.

[C] the datum.

[D] the centre of gravity of the aircraft.

80 A jet aeroplane is flying long range cruise. How does the specific range / fuel flow change? (1.00 P.)

[A] Decrease / decrease.

[B] Decrease / increase.

[C] Increase / decrease.

[D] Increase / increase.

81 The centre of gravity of an aircraft is that point through which the total mass of the aircraft is said to act. The weight acts in a direction (1.00 P.)

[A] always parallel to the aircraft's vertical axis.

[B] at right angles to the flight path.

[C] governed by the distribution of the mass within the aircraft.

[D] parallel to the gravity vector.

82 When an aircraft is stationary on the ground, its total weight will act vertically (1.00 P.)

[A] through its centre of pressure.

[B] through a point defined as the datum point.

[C] through its centre of gravity.

[D] through the main wheels of its undercarriage assembly.

83 During a glide at constant Mach number, the pitch angle of the aeroplane will: (1.00 P.)

[A] increase.

[B] increase at first and decrease later on.

[C] remain constant.

[D] decrease.

84 The weight of an aircraft, which is in level non accelerated flight, is said to act (1.00 P.)

[A] vertically through the centre of pressure.

[B] vertically through the centre of gravity.

[C] always along the vertical axis of the aircraft.

[D] vertically through the datum point.

85 During a cruise flight of a jet aeroplane at constant flight level and at the maximum range speed, the IAS / the drag will: (1.00 P.)

[A] decrease / increase.

[B] decrease / decrease.

[C] increase / decrease.

[D] increase / increase.

86 The centre of gravity of an aircraft (1.00 P.)

[A] must be maintained in a fixed position by careful distribution of the load.

[B] can be allowed to move between defined limits.

[C] is in a fixed position and is unaffected by aircraft loading.

[D] may only be moved if permitted by the regulating authority and endorsed in the aircraft's certificate of airworthiness.

87 An aeroplane carries out a descent from FL 410 to FL 270 at cruise Mach number, and from FL 270 to FL 100 at the IAS reached at FL 270.
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.
(1.00 P.)

[A] Decreases in the first part; increases in the second.

[B] Increases in the first part; decreases in the second.

[C] Increases in the first part; is constant in the second.

[D] Is constant in the first part; decreases in the second.

88 Which statement with respect to the step climb is correct? (1.00 P.)

[A] Executing a desired step climb at high altitude can be limited by buffet onset at g-loads greater than 1.

[B] A step climb is executed in principle when, just after levelling off, the 1.3g altitude is reached.

[C] A step climb is executed because ATC desires a higher altitude.

[D] A step climb must be executed immediately after the aeroplane has exceeded the optimum altitude.

89 In relation to an aircraft, the term ' Basic Empty Mass' includes the mass of the aircraft structure complete with its powerplants, systems, furnishings and other items of equipment considered to be an integral part of the particular aircraft configuration. Its value is (1.00 P.)

[A] inclusive of an allowance for crew, crew baggage and other operating items. It is entered in the loading manifest.

[B] found in the flight manual and is inclusive of unusable fuel plus fluids contained in closed systems.

[C] printed in the loading manual and includes unusable fuel.

[D] found in the latest version of the weighing schedule as corrected to allow for modifications.

90 An aeroplane is weighed and the following recordings are made:

nose wheel assembly scale	5330 kg
left main wheel assembly scale	12370 kg
right main wheel assembly scale	12480 kg

If the 'operational items' amount to a mass of 1780 kg with a crew mass of 545 kg, the empty mass, as entered in the weight schedule, is (1.00 P.)

[A] 32505 kg

[B] 28400 kg

[C] 30180 kg

[D] 31960 kg

91 Which of the following combinations basically has an effect on the angle of descent in a glide?
(Ignore compressibility effects.) (1.00 P.)

[A] Configuration and angle of attack.

[B] Mass and altitude.

[C] Altitude and configuration.

[D] Configuration and mass.

92 If individual masses are used, the mass of an aircraft must be determined prior to initial entry into service and thereafter (1.00 P.)

[A] at regular annual intervals.

[B] only if major modifications have taken place.

[C] at intervals of 4 years if no modifications have taken place.

[D] at intervals of 9 years.

93 Two identical aeroplanes at different masses are descending at idle thrust. Which of the following statements correctly describes their descent characteristics ? (1.00 P.)

[A] At a given angle of attack the lighter aeroplane will always glide further than 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, both the vertical and the forward speed are greater for the heavier aeroplane.

94 The empty mass of an aircraft is recorded in (1.00 P.)

[A] the weighing schedule and is amended to take account of changes due to modifications of the aircraft.

[B] the weighing schedule. If changes occur, due to modifications, the aircraft must be re-weighed always.

[C] the loading manifest. It differs from the zero fuel mass by the value of the 'traffic load'.

[D] the loading manifest. It differs from Dry Operating Mass by the value of the 'useful load'.

95 What is the effect of a head wind component, compared to still air, on the maximum range speed (IAS) and the speed for maximum climb angle respectively? (1.00 P.)

[A] Maximum range speed increases and maximum climb angle speed stays constant.

[B] Maximum range speed increases and maximum climb angle speed increases.

[C] Maximum range speed decreases and maximum climb angle speed increases.

[D] Maximum range speed decreases and maximum climb angle speed decreases.

96 Prior to departure an aircraft is loaded with 16500 litres of fuel at a fuel density of 780 kg/m^3. This is entered into the load sheet as 16500 kg and calculations are carried out accordingly. As a result of this error, the aircraft is (1.00 P.)

[A] heavier than anticipated and the calculated safety speeds will be too high

[B] heavier than anticipated and the calculated safety speeds will be too low.

[C] lighter than anticipated and the calculated safety speeds will be too high

[D] lighter than anticipated and the calculated safety speeds will be too low

97 For a jet aeroplane, the maximum climb angle is achieved at a speed corresponding to: (1.00 P.)

[A] the maximum CL/CD ratio

[B] 1.1 Vs

[C] the maximum CL/CD^2 ratio

[D] 1.2 Vs

98 The maximum speed in horizontal flight occurs when: (1.00 P.)

[A] The maximum thrust is equal to the total drag.

[B] The thrust does not increase further with increasing speed.

[C] The thrust is equal to minimum drag.

[D] The thrust is equal to the maximum drag.

99 An additional baggage container is loaded into the aft cargo compartment but is not entered into the load and trim sheet. The aeroplane will be heavier than expected and calculated take-off safety speeds (1.00 P.)

[A] are unaffected but V1 will be increased.

[B] will not be achieved.

[C] will give reduced safety margins.

[D] will be greater than required.

100 With respect to the optimum altitude, which of the following statements is correct ? (1.00 P.)

[A] An aeroplane sometimes flies above or below the optimum altitude because optimum altitude increases continuously during flight.

[B] An aeroplane always flies below the optimum altitude, because Mach buffet might occur.

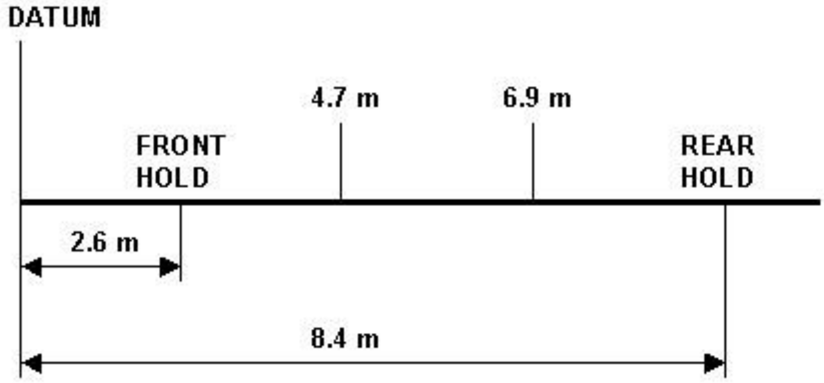
[C] An aeroplane always flies at the optimum altitude because this is economically seen as the most attractive altitude.

[D] An aeroplane flies most of the time above the optimum altitude because this yields the most economic result.

Anlagen zu den Aufgaben

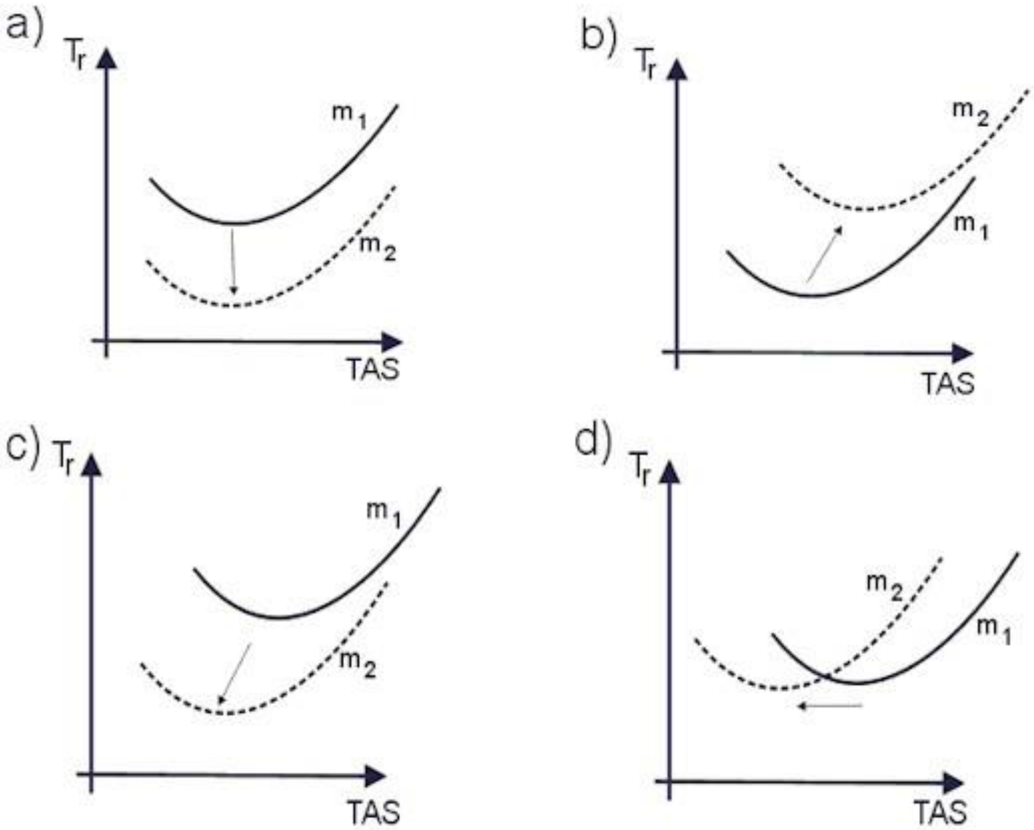
Anlage 1 zu Aufgabe 20

Titel: Anlage 1



Anlage 2 zu Aufgabe 30

Titel: Anlage 1



Anlage 3 zu Aufgabe 37

Titel: Anlage 1

Anlagen zu den Aufgaben

MASS AND BALANCE

DATA SHEEFT
AIRCRAFT MEP 1

Figure 3.4 LOADING MANIFEST

ITEM	Mass (Lbs.)	Arm Aft Of Datum (IN)	Moment (IN/Lbs.)
Basic Empty Mass	3210	88.5	
Pilot and Front Passenger		85.5	
Passengers (Centre Seats) or Baggage Zone 2 (360 LB Max.)		118.5	
Passengers (Rear Seats) or Baggage Zone 3 (400 LB Max.)		157.6	
Baggage Zone 1 (100 LB Max.)		22.5	
Baggage Zone 4 (100 LB Max.)		178.7	
Zero Fuel Mass (4470 LB Max - Std)			
Fuel(123Gal. Max.).		93.6	
Ramp Mass (4773 LB Max)			
Fuel Allowance for Start, Taxi, Run-up		93.6	
Take-off Mass (4750 LB Max.)			
Minus Estimated Fuel Burn-off		93.6	
Landing Mass (4513 LB Max.)			

* N.B. Maximum mass values given in this table are for **structural limits only**

Anlage 4 zu Aufgabe 39

Titel: Anlage 1

Anlagen zu den Aufgaben

Figure 3.4 LOADING MANIFEST

ITEM	Mass (Lbs.)	Arm Aft Of Datum (IN)	Moment (IN/Lbs.)
Basic Empty Mass	3210	88.5	
Pilot and Front Passenger		85.5	
Passengers (Centre Seats) or Baggage Zone 2 (360 LB Max.)		118.5	
Passengers (Rear Seats) or Baggage Zone 3 (400 LB Max.)		157.6	
Baggage Zone 1 (100 LB Max.)		22.5	
Baggage Zone 4 (100 LB Max.)		178.7	
Zero Fuel Mass (4470 LB Max - Std)			
Fuel(123Gal. Max.).		93.6	
Ramp Mass (4773 LB Max)			
Fuel Allowance for Start, Taxi, Run-up		93.6	
Take-off Mass (4750 LB Max.)			
Minus Estimated Fuel Burn-off		93.6	
Landing Mass (4513 LB Max.)			

* N.B. Maximum mass values given in this table are for **structural limits only**

Anlage 5 zu Aufgabe 42

Titel: Anlage 1

Anlagen zu den Aufgaben

Figure 3.4 LOADING MANIFEST

ITEM	Mass (Lbs.)	Arm Aft Of Datum (IN)	Moment (IN/Lbs.)
Basic Empty Mass	3210	88.5	
Pilot and Front Passenger		85.5	
Passengers (Centre Seats) or Baggage Zone 2 (360 LB Max.)		118.5	
Passengers (Rear Seats) or Baggage Zone 3 (400 LB Max.)		157.6	
Baggage Zone 1 (100 LB Max.)		22.5	
Baggage Zone 4 (100 LB Max.)		178.7	
Zero Fuel Mass (4470 LB Max - Std)			
Fuel(123Gal. Max.).		93.6	
Ramp Mass (4773 LB Max)			
Fuel Allowance for Start, Taxi, Run-up		93.6	
Take-off Mass (4750 LB Max.)			
Minus Estimated Fuel Burn-off		93.6	
Landing Mass (4513 LB Max.)			

* N.B. Maximum mass values given in this table are for **structural limits only**

Anlage 6 zu Aufgabe 44

Titel: Anlage 1

Anlagen zu den Aufgaben

Figure 3.4 LOADING MANIFEST

ITEM	Mass (Lbs.)	Arm Aft Of Datum (IN)	Moment (IN/Lbs.)
Basic Empty Mass	3210	88.5	
Pilot and Front Passenger		85.5	
Passengers (Centre Seats) or Baggage Zone 2 (360 LB Max.)		118.5	
Passengers (Rear Seats) or Baggage Zone 3 (400 LB Max.)		157.6	
Baggage Zone 1 (100 LB Max.)		22.5	
Baggage Zone 4 (100 LB Max.)		178.7	
Zero Fuel Mass (4470 LB Max - Std)			
Fuel(123Gal. Max.).		93.6	
Ramp Mass (4773 LB Max)			
Fuel Allowance for Start, Taxi, Run-up		93.6	
Take-off Mass (4750 LB Max.)			
Minus Estimated Fuel Burn-off		93.6	
Landing Mass (4513 LB Max.)			

* N.B. Maximum mass values given in this table are for **structural limits only**

Anlage 7 zu Aufgabe 46

Titel: Anlage 1

Anlagen zu den Aufgaben

CIVIL AVIATION AUTHORITY
MASS AND BALANCE

DATA SHEET
AIRCRAFT-S.E.P.1

Fig.2.4 LOADING MANIFEST SEP1

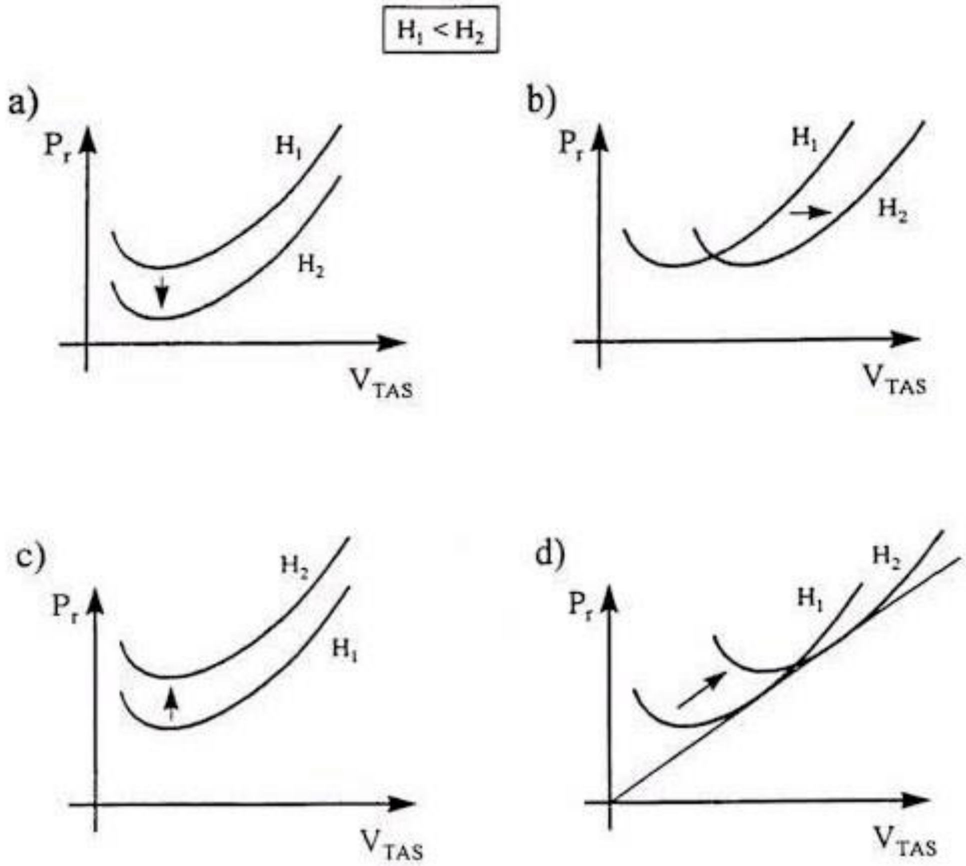
ITEM	MASS	ARM (IN)	MOMENT X100
1. BASIC EMPTY CONDITION			
2. FRONT SEAT OCCUPANTS		79	
3. THIRD & FOURTH SEAT PAX		117	
4. BAGGAGE ZONE 'A1		108	
5. FIFTH & SIXTH SEAT PAX		152	
6. BAGGAGE ZONE 'B'		150	
7. BAGGAGE ZONE 'C1		180	
SUB - TOTAL = ZERO FUEL MASS			
8. FUEL LOADING			
SUB -TOTAL = RAMP MASS			
9. SUBTRACT FUEL FOR START, TAXI & RUN UP. (SEE NOTE)			
SUB- TOTAL = TAKE OFF MASS			
10. TRIP FUEL			
SUB -TOTAL = LANDING MASS			

NB. FUEL FOR START TAXI AND RUN UP IS NORMALLY 13 LBS AT AN AVERAGE ENTRY OF 10 IN THE COLUMN HEADED **MOMENT (X 100)**

Anlage 8 zu Aufgabe 65

Titel: Anlage 1

Anlagen zu den Aufgaben



Anlage 9 zu Aufgabe 77

Titel: Anlage 1

Anlagen zu den Aufgaben

CIVILAVIATION AUTHORITY
PERFORMANCE - AEROPLANES

DATA SHEET
SEP 1

Figure 2.4 Landing

LANDING DISTANCE

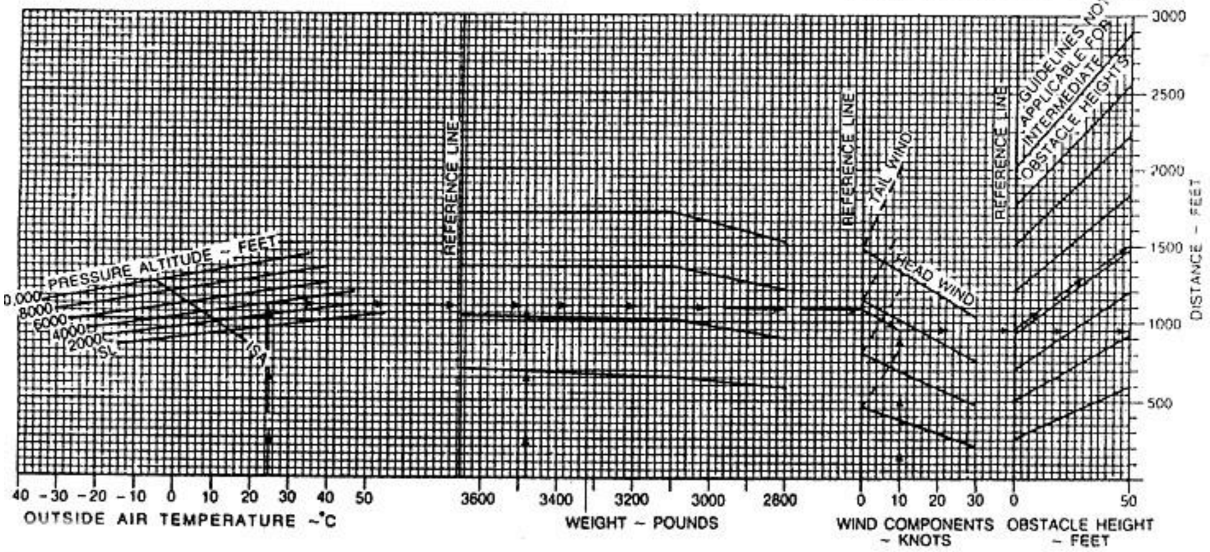
ASSOCIATED CONDITIONS:

POWER	RETARDED TO MAINTAIN 900 FT/MIN ON FINAL APPROACH
FLAPS	DOWN (AMBER)
LANDING GEAR	DOWN
RUNWAY	PAVED, LEVEL, DRY SURFACE
APPROACH SPEED	IAS AS TABULATED
BRAKING	MAXIMUM

WEIGHT ~ POUNDS	SPEED AT 50 FT KNOTS
3650	79
3400	80
3200	81
3000	81
2800	78

EXAMPLE:

OAT	25°C
PRESSURE ALTITUDE	3965 FT
WEIGHT	3479 LBS
HEADWIND COMPONENT	10 KTS
GROUND ROLL	960 FT
TOTAL OVER 50 FT OBSTACLE	1515 FT
APPROACH SPEED	80 KTS



Vom Teilnehmer auszufüllen

Name:	Prüf.-Nr.:
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1.	A	B	C	D	**2.**	A	B	C	D	**3.**	A	B	C	D
4.	**A**	**B**	**C**	**D**	**5.**	**A**	**B**	**C**	**D**	**6.**	**A**	**B**	**C**	**D**
7.	**A**	**B**	**C**	**D**	**8.**	**A**	**B**	**C**	**D**	**9.**	**A**	**B**	**C**	**D**
10.	**A**	**B**	**C**	**D**	**11.**	**A**	**B**	**C**	**D**	**12.**	**A**	**B**	**C**	**D**
13.	**A**	**B**	**C**	**D**	**14.**	**A**	**B**	**C**	**D**	**15.**	**A**	**B**	**C**	**D**
16.	**A**	**B**	**C**	**D**	**17.**	**A**	**B**	**C**	**D**	**18.**	**A**	**B**	**C**	**D**
19.	**A**	**B**	**C**	**D**	**20.**	**A**	**B**	**C**	**D**	**21.**	**A**	**B**	**C**	**D**
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31.	**A**	**B**	**C**	**D**	**32.**	**A**	**B**	**C**	**D**	**33.**	**A**	**B**	**C**	**D**
34.	**A**	**B**	**C**	**D**	**35.**	**A**	**B**	**C**	**D**	**36.**	**A**	**B**	**C**	**D**
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40.	**A**	**B**	**C**	**D**	**41.**	**A**	**B**	**C**	**D**	**42.**	**A**	**B**	**C**	**D**
43.	**A**	**B**	**C**	**D**	**44.**	**A**	**B**	**C**	**D**	**45.**	**A**	**B**	**C**	**D**
46.	**A**	**B**	**C**	**D**	**47.**	**A**	**B**	**C**	**D**	**48.**	**A**	**B**	**C**	**D**
49.	**A**	**B**	**C**	**D**	**50.**	**A**	**B**	**C**	**D**	**51.**	**A**	**B**	**C**	**D**
52.	**A**	**B**	**C**	**D**	**53.**	**A**	**B**	**C**	**D**	**54.**	**A**	**B**	**C**	**D**
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58.	**A**	**B**	**C**	**D**	**59.**	**A**	**B**	**C**	**D**	**60.**	**A**	**B**	**C**	**D**
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64.	**A**	**B**	**C**	**D**	**65.**	**A**	**B**	**C**	**D**	**66.**	**A**	**B**	**C**	**D**

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67.	**A**	**B**	**C**	**D**	**68.**	**A**	**B**	**C**	**D**	**69.**	**A**	**B**	**C**	**D**
70.	**A**	**B**	**C**	**D**	**71.**	**A**	**B**	**C**	**D**	**72.**	**A**	**B**	**C**	**D**
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94.	**A**	**B**	**C**	**D**	**95.**	**A**	**B**	**C**	**D**	**96.**	**A**	**B**	**C**	**D**
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100.	**A**	**B**	**C**	**D**										

Nur für den internen Gebrauch	
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1.			C		**2.**			C		**3.**			C	
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7.			**C**		**8.**			**C**		**9.**				**D**
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22.		**B**			**23.**	**A**				**24.**			**C**	
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28.		**B**			**29.**		**B**			**30.**			**C**	
31.			**C**		**32.**	**A**				**33.**	**A**			
34.		**B**			**35.**				**D**	**36.**				**D**
37.				**D**	**38.**			**C**		**39.**	**A**			
40.			**C**		**41.**	**A**				**42.**			**C**	
43.				**D**	**44.**			**C**		**45.**	**A**			
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52.				**D**	**53.**				**D**	**54.**			**C**	
55.	**A**				**56.**	**A**				**57.**		**B**		
58.		**B**			**59.**				**D**	**60.**			**C**	
61.			**C**		**62.**			**C**		**63.**	**A**			
64.		**B**			**65.**	**A**				**66.**			**C**	

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85.		**B**			**86.**		**B**			**87.**			**C**	
88.	**A**				**89.**				**D**	**90.**			**C**	
91.	**A**				**92.**			**C**		**93.**				**D**
94.	**A**				**95.**	**A**				**96.**			**C**	
97.	**A**				**98.**	**A**				**99.**			**C**	
100.	**A**													