Examination Center DGAC

Examination Date _____

Name _____

Firstname _____

Birthday _____

1 For a frequency of 200 KHZ, what is the wavelength; (1.00 P.)

[A] 1500km

[B] 150m

[C] 1500m

[D] 150km

2 An aircraft departs from position A (04°10' S 178°22'W) and flies northward following the meridian for 2950 NM. It then flies westward along the parallel of latitude for 382 NM to position B.
The coordinates of position B are? (1.00 P.)

[A] 53°20'N 169°22W

[B] 45°00'N 172°38'E

[C] 53°20'N 172°38'E

[D] 45°00'N 169°22W

3 The angle between the true great-circle track and the true rhumb-line track joining the following points: A (60° S 165° W) B (60° S 177° E), at the place of departure A, is: (1.00 P.)

[A] 5.2°

[B] 9°

[C] 15.6°

[D] 7.8°

4 The factors that determine the ranges available from the sky waves are: (1.00 P.)

[A] Transmission power, diffraction, critical angle and angle of incidence.

[B] Transmission power, depth of penetration, critical angle and angle of incidence.

[C] Transmission power, conductivity of earth's surface and angle of incidence.

[D] Critical angle, refraction, angle of incidence and diffraction.

5 In aviation, the reflection on ionosphere layers phenomenon is used in the following frequencies: (1.00 P.)

[A] HF

[B] VHF

[C] VLF

[D] UHF

6 The wavelength of a radio transmitted on frequency 121.95 MHz is: (1.00 P.)

[A] 24.60 cm

[B] 2.46 m

[C] 24.60 m

[D] 2.46 cm

7 Skip distance in relation to the sky wave is; (1.00 P.)

[A] distance between the receiver and the transmitter.

[B] distance between the transmitter and the point of first return of the sky wave on the surface.

[C] distance between the point of receiving the surface wave and the first return of the sky wave, where no reception is possible.

[D] distance between the point of receiving and the 1st sky wave return on the surface.

8 Given: Waypoint 1. 60°S 030°W
Waypoint 2. 60°S 020°W
What will be the approximate latitude shown on the display unit of an inertial navigation system at longitude 025°W? (1.00 P.)

[A] 060°11'S

[B] 060°00'S

[C] 060°06'S

[D] 059°49'S

9 What is the time required to travel along the parallel of latitude 60° N between meridians 010° E and 030° W at a groundspeed of 480 kt? (1.00 P.)

[A] 5 HR 00 MIN

[B] 2 HR 30 MIN

[C] 1 HR 45 MIN

[D] 1 HR 15 MIN

10 Night effect when using NDB may be minimized by; (1.00 P.)

[A] use a low frequency NDB, operate at dusk and dawn, use a high powered NDB and utilise NDB's afar off from the aircraft.

[B] using a high frequency NDB, avoid operation at dusk and dawn, use a high powered NDB and utilise NDB's near the aircraft.

[C] use a high frequency NDB, operate at dusk and dawn, use a low powered NDB and utilise NDB's near the aircraft.

[D] use a low frequency NDB, avoid operations at dusk and dawn, use a high powered NDB and utilise NDB's near the aircraft.

11 If a failed RMI rose is stuck on 090° and the ADF pointer indicates 225°, the relative bearing to the station will be: (1.00 P.)

[A] Impossible to read, due to the RMI failure.

[B] 135°.

[C] 315°.

[D] 225°.

12 An aircraft is on Heading 225° (M) ADF RMI reading 315° (M) variation 15° (W), Quadrantal error will be: (1.00 P.)

[A] Zero.

[B] Maximum.

[C] proportional to sine heading times the signal strength.

[D] proportional to the tangent of the RMI reading.

13 An aircraft is maintaining a track outbound from an NDB with a constant relative bearing of 187° and a heading of 060° M. .To return to the NDB, the relative bearing to maintain is; (1.00 P.)

[A] 247°

[B] 007°

[C] 067°

[D] 353°

14 An aircraft is following the 45°N parallel of latitude.
The track followed is a: (1.00 P.)

[A] constant-drift track

[B] constant-heading track

[C] great circle

[D] rhumb line

15 An aircraft on heading 040° M has an ADF reading of 060° Relative. The alteration of heading to intercept the 120° Track inbound to the NDB at 50° in zero wind conditions is; (1.00 P.)

[A] 40° Right.

[B] 50° Right.

[C] 30° Right.

[D] 20° Right.

16 Position A is located on the equator at longitude 130°00E.
Position B is located 100 NM from A on a bearing of 225°(T).
The coordinates of position B are: (1.00 P.)

[A] 01°11'S 131°11'E

[B] 01°11'N 131°11'E

[C] 01°11'S 128°49'E

[D] 01°11'N 128°49'E

17 The ICAO NDB frequency band is; (1.00 P.)

[A] 200 khz to 800 khz.

[B] 200 khz to 1750 khz.

[C] 200 khz to 112 Mhz.

[D] 200 khz to 500 khz.

18 In order to fly from position A (10°00'N, 030°00'W) to position B (30°00'N, 050°00'W), maintaining a constant true course, it is necessary to fly: (1.00 P.)

[A] a rhumb line track

[B] the constant average drift route

[C] the great-circle route

[D] a straight line plotted on a Lambert chart

19 The advantages of Single Side-Band Transmissions as compared with Double Side- Band Transmissions are: (1.00 P.)

[A] Power is concentrated on frequency.

[B] Transmitter power is concentrated on three frequencies.

[C] Long range transmission and narrow band width.

[D] Narrow band width in the frequency band.

20 The purpose of Beat Frequency Oscillator (BFO) in ADF receiver is to; (1.00 P.)

[A] Remove oscillations of the bearing indicator.

[B] Make the incoming signal audible .

[C] Remove noise from the incoming signal .

[D] Improve the strength of the incoming signal .

21 The rhumb line track between position A (45°00'N, 010°00'W) and position B (48°30'N, 015°00'W) is approximately: (1.00 P.)

[A] 300

[B] 330

[C] 315

[D] 345

22 When there is a significant fault in the transmission of the ILS, the following will happen; (1.00 P.)

[A] The needle moves to the centre and the flag appears in the appropriate window .

[B] No indication.

[C] The alarm flag showing 'ON' appears in the appropriate window.

[D] A flag alarm showing 'off' appears on the appropriate window.

23 The diameter of the Earth is approximately: (1.00 P.)

[A] 12 700 km

[B] 40 000 km

[C] 6 350 km

[D] 18 500 km

24 The Glipe Path angle of an ILS is 3°. What is the elevation coverage? (1.00 P.)

[A] 0.45° below the GP to 1.75 above the ILS reference point.

[B] 1.35° from the horizontal to 5.25° from the horizontal.

[C] 8° either side of the ILS reference point.

[D] 0.45° below GP to 1.75° above GP.

25 With reference to VOR the cone of confusion is; (1.00 P.)

[A] an area around a VOR station where the signals radiate in a confused pattern.

[B] an area around a VOR station where the reading is zero.

[C] an area overhead a VOR station in form of a cone with a vertical angle of about 80° where the VOR indications are undetermined.

[D] an area overhead a VOR station in the form of an inverted cone which has 10 degrees either side of the vertical where the VOR indications are undetermined.

26 The nominal scale of a Lambert conformal conic chart is the: (1.00 P.)

[A] mean scale between the parallels of the secant cone

[B] mean scale between pole and equator

[C] scale at the equator

[D] scale at the standard parallels

27 DME signals are affected by: (1.00 P.)

[A] night effect and propagation errors.

[B] thunderstorm and propagation errors.

[C] none of the responses

[D] static and night effect.

28 The chart that is generally used for navigation in polar areas is based on a: (1.00 P.)

[A] Stereographical projection

[B] Lambert conformal projection

[C] Gnomonic projection

[D] Direct Mercator projection

29 A Mercator chart has a scale at the equator = 1: 3 704 000.
What is the scale at latitude 60° S? (1.00 P.)

[A] 1: 185 200

[B] 1: 7 408 000

[C] 1: 3 208 000

[D] 1: 1 852 000

30 What circumstances would cause a warning shortly after take-off when using Ground Proximity Warning System (GPWS)? (1.00 P.)

[A] Height loss between 50 ft - 700 ft.

[B] Height loss between 200 ft - 700 ft.

[C] Height loss between 100 ft - 500 ft.

[D] Height loss between 100 ft - 700 ft.

31 The distance measured between two points on a navigation map is 42 mm (millimetres). The scale of the chart is 1:1 600 000.
The actual distance between these two point is approximately: (1.00 P.)

[A] 370.00 NM

[B] 36.30 NM

[C] 3.69 NM

[D] 67.20 NM

32 In a Doppler display in an aircraft the distance to go on the stage is usually more accurate than the distance left/right of the desired track because: (1.00 P.)

[A] The heading input is the main source of error and it affects the across track accuracy.

[B] The Doppler computer is much more accurate when computing distance to go.

[C] none of the above.

[D] The land/sea switch enhances sensitivity and therefore ground speed input for the calculation of distance to G is very accurate.

33 The standard parallels of a Lambert's conical orthomorphic projection are 07°40'N and 38°20' N.
The constant of the cone for this chart is: (1.00 P.)

[A] 0.39

[B] 0.60

[C] 0.92

[D] 0.42

34 The maximum range of a Radar is governed by; (1.00 P.)

[A] Pulse interval.

[B] Pulse repetition frequency and pulse interval.

[C] Pulse repetition frequency.

[D] Pulse width.

35 On a Lambert conformal conic chart the convergence of the meridians: (1.00 P.)

[A] is the same as earth convergency at the parallel of origin

[B] varies as the secant of the latitude

[C] is zero throughout the chart

[D] equals earth convergency at the standard parallels

36 With respect to Secondary Surveillance Radar (SSR), Mode C provides; (1.00 P.)

[A] Radio failure when coupled with code A 7600.

[B] The range of the Aircraft.

[C] Automatic Pressure Attitude Information.

[D] Normal Identification of Aircraft.

37 State three uses of weather radar in addition to the cloud detection; (1.00 P.)

[A] ground mapping, detection of Clear Air Turbulence (CAT) determination of approximate cloud heights.

[B] safe terrain clearance, determination of approximate cloud heights, ground mapping.

[C] indicate height, distance and amount of cloud.

[D] safe Terrain Clearance, ground Mapping, Air Traffic Control Separation Purposes.

38 A straight line drawn on a chart measures 4.63 cm and represents 150 NM. The chart scale is: (1.00 P.)

[A] 1: 1 000 000

[B] 1: 5 000 000

[C] 1: 3 000 000

[D] 1: 6 000 000

39 On a Polar Stereographic chart, the initial great circle course from A 70°N 060°W to B 70°N 060°E is approximately: (1.00 P.)

[A] 330° (T)

[B] 210° (T)

[C] 030° (T)

[D] 150° (T)

40 On a Direct Mercator chart, a rhumb line appears as a: (1.00 P.)

[A] small circle concave to the nearer pole

[B] spiral curve

[C] straight line

[D] curve convex to the nearer pole

41 A VOR is sited at position A (45°00'N, 010°00'E). An aircraft is located at position B (44°00'N, 010°00'E). Assuming that the magnetic variation at A is 10°W and at B is 15°W, the aircraft is on VOR radial: (1.00 P.)

[A] 190°

[B] 180°

[C] 195°

[D] 185°

42 If the Barometer reads 1010 hpa at ground level and 1008 hpa at height on top of a building, what is the height of the building? (1.00 P.)

[A] 60 ft.

[B] 120 ft.

[C] 30 ft.

[D] 90 ft.

43 What happens to the capsule in an altimeter as the aircraft gains height? (1.00 P.)

[A] The value of the static and atmospheric pressure equalise within and around the capsule.

[B] The value of the static pressure increases and the capsule contracts under the tension of atmospheric pressure.

[C] The value of static pressure decreases and the capsule expands under the tension of the spring.

[D] The value of the static pressure increases and the capsule contracts under the tension of the spring.

44 The great circle distance between position A (59°34.1'N 008°08.4'E) and B (30°25.9'N 171°51.6'W) is: (1.00 P.)

[A] 2 700 NM

[B] 10 800 km

[C] 10 800 NM

[D] 5 400 NM

45 Under what conditions are altimeters, calibrated? (1.00 P.)

[A] MSL pressure 1020 hpa, MSL Temp + 15°C Lapse rate 2° per 1 000 ft from MSL to 20,000 ft etc.

[B] MSL pressure 1013.0 hpa, MSL Temp O°C lapse rate 1.98° per 1000 ft from MSL to 10,000 ft. etc.

[C] MSL pressure 10 1 3.2 hpa MSL Temp + 15°C Lapse rate 1.98° per I 000 ft from MSL to 36,000 etc.

[D] MSL pressure 1020 hpa, MSL temp O°C Lapse rate 2° per 1000 ft from MSL to 55000 ft etc.

46 On a Lambert Conformal Conic chart great circles that are not meridians are: (1.00 P.)

[A] straight lines regardless of distance

[B] curves concave to the parallel of origin

[C] curves concave to the pole of projection

[D] straight lines within the standard parallels

47 What is the cause of pressure error in an altimeter? (1.00 P.)

[A] Position of the pitot tube.

[B] Position of the Aircraft in flight.

[C] Position of the altimeter.

[D] Position of the static vent.

48 On a direct Mercator projection, at latitude 45° North, a certain length represents 70 NM.
At latitude 30° North, the same length represents approximately: (1.00 P.)

[A] 70 NM

[B] 86 NM

[C] 57 NM

[D] 81 NM

49 When flying from an area of high pressure to an area of low pressure, what indication does the altimeter give in relation to the height AGL? (1.00 P.)

[A] Height change not indicated.

[B] Under-reads.

[C] Over-reads

[D] Zero.

50 Given:
Position A 45°N, ?°E
Position B 45°N, 45°15'E
Distance A-B = 280 NM
B is to the East of A
Required: longitude of position A? (1.00 P.)

[A] 49°57'E

[B] 51°51'E

[C] 38°39'E

[D] 40°33'E

51 On a polar stereographic projection chart showing the South Pole, a straight line joins position A (70°S 065°E) to position B (70°S 025°W).
The true course on departure from position A is approximately: (1.00 P.)

[A] 315°

[B] 225°

[C] 135°

[D] 250°

52 On a direct Mercator projection, the distance measured between two meridians spaced 5° apart at latitude 60°N is 8 cm.
The scale of this chart at latitude 60°N is approximately: (1.00 P.)

[A] 1: 3 500 000

[B] 1: 6 000 000

[C] 1: 7 000 000

[D] 1: 4 750 000

53 On a Mercator chart, a great circle is represented as a: (1.00 P.)

[A] Curve concave to the meridians.

[B] Curve concave to the Equator.

[C] Straight line.

[D] Curve concave to the nearer pole.

54 Two positions plotted on a polar stereographic chart, A (80°N 000°) and B (70°N 102°W) are joined by a straight line whose highest latitude is reached at 035°W. At point B, the true course is: (1.00 P.)

[A] 305°

[B] 247°

[C] 023°

[D] 203°

55 What is the meaning of the word "wave length" in relation to radio signals? (1.00 P.)

[A] The maximum displacement or value a radio signal attains from its mean position during a cycle.

[B] The physical distance traveled by the radio wave during one complete cycle of transmission.

[C] The number of cycles occurring in one second expressed in Hertz.

[D] One complete series of values or one complete process.

56 How does the scale vary in a Direct Mercator chart? (1.00 P.)

[A] The scale increases south of the Equator and decreases north of the Equator.

[B] The scale is constant.

[C] The scale decreases with increasing distance from the Equator.

[D] The scale increases with increasing distance from the Equator.

57 The frequency of a radio wave is : (1.00 P.)

[A] the distance travelled during the transmission of one cycle

[B] the rate of chnage of a wave

[C] the number of cycles in one second

[D] one complete change of direction of current

58 Given:
Magnetic heading 311°
Drift angle 10° left
Relative bearing of NDB 270°
What is the magnetic bearing of the NDB measured from the aircraft? (1.00 P.)

[A] 211°

[B] 180°

[C] 208°

[D] 221°

59 With reference to basic radio theory, the amplitude of a radio wave is: (1.00 P.)

[A] one complete change of direction:

[B] the peak value of the current in either direction

[C] the longitudial dispalcement of a sine wave

[D] the number of cycles in one second

60 A DME station is located 1000 feet above MSL.
An aircraft flying at FL 370 in ISA conditions which is 15 NM away from the DME station, will have a DME reading of: (1.00 P.)

[A] 16 NM

[B] 14 NM

[C] 17 NM

[D] 15 NM

61 The frequency which corresponds to a wavelength of 12 cm is ; (1.00 P.)

[A] 2 500 MHz

[B] 250 GHz

[C] 2 500 kHz

[D] 2 500 Hz

62 Given the following:
True track: 192°
Magnetic variation: 7°E
Drift angle: 5° left
What is the magnetic heading required to maintain the given track? (1.00 P.)

[A] 190°

[B] 194°

[C] 180°

[D] 204°

63 The frequency which corresponds to a wavelength of 1500 metres is (1.00 P.)

[A] 400 Hz

[B] 200 KHz

[C] 2 000 GHz

[D] 400 MHz

64 Given the following:
Magnetic heading: 060°
Magnetic variation: 8°W
Drift angle: 4° right
What is the true track? (1.00 P.)

[A] 072°

[B] 048°

[C] 056°

[D] 064°

65 If the transmission frequency is 75 MHz, the wavelength is (1.00 P.)

[A] 4 km

[B] 800 m

[C] 8 cm

[D] 4 metres

66 An aircraft is following a true track of 048° at a constant TAS of 210 kt.
The wind velocity is 350° / 30 kt.
The GS and drift angle are: (1.00 P.)

[A] 192 kt, 7° left

[B] 200 kt, 3.5° right

[C] 192 kt, 7° right

[D] 225 kt, 7° left

67 If the frequency of a raio aid is 1 439 kHz, the wavelength is (1.00 P.)

[A] 2.0847 cm

[B] 208.47 metres

[C] 208.47 cm

[D] 0.20847 metres

68 Given:
FL 350,
Mach 0.80,
OAT -55°C.
Calculate the values for TAS and local speed of sound (LSS)? (1.00 P.)

[A] 461 kt , LSS 576 kt

[B] 237 kt, LSS 296 kt

[C] 461 kt , LSS 296 kt

[D] 490 kt, LSS 461 kt

69 Given:
Magnetic heading = 255°
VAR = 40°W
GS = 375 kt
W/V = 235°(T) / 120 kt
Calculate the drift angle? (1.00 P.)

[A] 3° left

[B] 6° right

[C] 6° left

[D] 9° left

70 The wavelength of a radio wave transmission is: (1.00 P.)

[A] one complete change of direction of current

[B] the lateral dispalcement of a wave

[C] the distance travelled during the transmission of one cycle

[D] the number of cycles in one second

71 Given:
True Heading = 180°
TAS = 500 kt
W/V 225° / 100 kt
Calculate the GS? (1.00 P.)

[A] 535 kt

[B] 450 kt

[C] 435 kt

[D] 600 kt

72 Given:
True heading = 310°
TAS = 200 kt
GS = 176 kt
Drift angle 7° right.
Calculate the W/V? (1.00 P.)

[A] 360° / 33 kt

[B] 270° / 33 kt

[C] 180° / 33 kt

[D] 090° / 33 kt

73 Which of the following will give the most accurate calculation of aircraft ground speed? (1.00 P.)

[A] A DME station sited across the flight route

[B] A VOR station sited on the flight route

[C] A DME station sited on the flight route

[D] An ADF sited on the flight route

74 Polarisation is the term used to describe the plane of oscillation of the; (1.00 P.)

[A] the magnetic field of an electromagnetic wave

[B] electrical field of an electromagnetic wave

[C] the electrical and magnetic field of an electromagnetic wave

[D] none of the above

75 If an aeroplane was to circle around the Earth following parallel 60°N at a ground speed of 480 kt. In order to circle around the Earth along the equator in the same amount of time, it should fly at a ground speed of: (1.00 P.)

[A] 240 kt

[B] 550 kt

[C] 480 kt

[D] 960 kt

76 Polarisation is the term used to describe the plane of oscillation of the; (1.00 P.)

[A] electrical field of an electromagnetic wave

[B] the electrical and magnetic field of an electromagnetic wave

[C] the magnetic field of an electromagnetic wave

[D] none of the above

77 Given:
True Heading = 090°
TAS = 180 kt
GS = 180 kt
Drift 5° right
Calculate the W/V? (1.00 P.)

[A] 005° / 15 kt

[B] 190° / 15 kt

[C] 355° / 15 kt

[D] 185° / 15 kt

78 Given:
True Heading = 090°
TAS = 200 kt
W/V = 220° / 30 kt.
Calculate the GS? (1.00 P.)

[A] 220 kt

[B] 230 kt

[C] 180 kt

[D] 200 kt

79 Radio waves travel at the speed of light which is taken to be constant at (1.00 P.)

[A] 3 x 120nm/s

[B] 3 x 1010 km/sec

[C] 3 x 108 m/sec

[D] 3 x 105 cm/sec

80 Radio waves travel at the speed of light which is taken to be constant at (1.00 P.)

[A] 3 x 108 m/sec

[B] 3 x 1010 km/sec

[C] 3 x 120nm/s

[D] 3 x 105 cm/sec

81 An aeroplane is flying at TAS 180 kt on a track of 090°.
The W/V is 045° / 50kt.
How far can the aeroplane fly out from its base and return in one hour? (1.00 P.)

[A] 85 NM

[B] 176 NM

[C] 88 NM

[D] 56 NM

82 The following information is displayed on an Inertial Navigation System:
GS 520 kt,
True HDG 090°,
Drift angle 5° right,
TAS 480 kt.
SAT (static air temperature) -51°C.
The W/V being experienced is: (1.00 P.)

[A] 225° / 60 kt

[B] 220° / 60 kt

[C] 325° / 60 kt

[D] 320° / 60 kt

83 The frequency corresponding to a wavelength of 750 metres is (1.00 P.)

[A] 400 KHz

[B] 400 MHz

[C] 400 GHz

[D] 400 Hz

84 The reported surface wind from the Control Tower is 240°/35 kt. Runway 30 (300°).
What is the cross-wind component? (1.00 P.)

[A] 27 kt

[B] 24 kt

[C] 21 kt

[D] 30 kt

85 An aircraft passes position A (60°00'N 120°00'W) on route to position B (60°00'N 140°30'W).
What is the great circle track on departure from A? (1.00 P.)

[A] 279°

[B] 261°

[C] 270°

[D] 288°

86 A great circle track joins position A (59°S 141°W) and B (61°S 148°W).
What is the difference between the great circle track at A and B? (1.00 P.)

[A] It decreases by 6°

[B] It increases by 3°

[C] It increases by 6°

[D] It decreases by 3°

87 What is the longitude of a position 6 NM to the east of 58°42'N 094°00'W? (1.00 P.)

[A] 093°53.1'W

[B] 094°12.0'W

[C] 093°54.0'W

[D] 093°48.5'W

88 If the frequency of a radar set is 13 500 MHz, the wavelength is (1.00 P.)

[A] 2.22 metres

[B] 2.22 cm

[C] 0.22 cm

[D] 0.22 metres

89 An aircraft is maintaining a 5.2% gradient is at 7 NM from the runway, on a flat terrain; its height is approximately: (1.00 P.)

[A] 2210 FT

[B] 680 FT

[C] 3640 FT

[D] 1890 FT

90 The amplitude modulation and the colour of an outer marker (OM) is: (1.00 P.)

[A] 3000 Hz, blue

[B] 400 Hz, amber

[C] 1300 Hz, blue

[D] 400 Hz, blue

91 An RMI indicates aircraft heading and bearing. To convert the RMI bearings of NDBs and VORs to true bearings the correct combination for the application of magnetic variation is: (1.00 P.)

[A] NDB: aircraft position
VOR: aircraft position

[B] NDB: beacon position
VOR: beacon position

[C] NDB: aircraft position
VOR: beacon position

[D] NDB: beacon position
VOR: aircraft position

92 Radio intelligence and information are relayed from a transmitter to a receiver by; (1.00 P.)

[A] phase difference

[B] polarisation

[C] line-of-sight

[D] modulation

93 An aircraft is flying on the true track 090° towards a VOR station located near the equator where the magnetic variation is 15°E. The variation at the aircraft position is 8°E.
The aircraft is on VOR radial: (1.00 P.)

[A] 285°

[B] 255°

[C] 278°

[D] 262°

94 Given:
Magnetic heading 280°
VOR radial 090°
What bearing should be selected on the omni-bearing selector in order to centralise the VOR deviation needle with a "TO" indication? (1.00 P.)

[A] 280°

[B] 270°

[C] 100°

[D] 090°

95 Amplitude modulation is; (1.00 P.)

[A] All of the options

[B] varying the amplitude of the audio frequency in accordance with the change in amplitude of the carrier, keeping the frequency of the carrire constant

[C] varying the frequency of the carrier in accordance with the change in the amplitude of the audio, keeping the amplitude of the carrier constant

[D] varying the amplitude of the carrier wave in accordance with the change in amplitude of the audio modulating signal keeping the carrier frequency constant

96 A VOR is sited at position 58°00'N 073°00'W where the magnetic variation equals 32°W.
An aircraft is located at position 56°00'N 073°00'W where the magnetic variation equals 28°W.
The aircraft is on VOR radial: (1.00 P.)

[A] 212

[B] 360

[C] 208

[D] 180

97 In order to plot a bearing from a VOR station, a pilot needs to know the magnetic variation: (1.00 P.)

[A] at the half-way point between the aircraft and the station

[B] at the aircraft location

[C] at both the VOR and aircraft

[D] at the VOR

98 Amplitude modulation is; (1.00 P.)

[A] All of the options

[B] varying the amplitude of the carrier wave in accordance with the change in amplitude of the audio modulating signal keeping the carrier frequency constant

[C] varying the amplitude of the audio frequency in accordance with the change in amplitude of the carrier, keeping the frequency of the carrire constant

[D] varying the frequency of the carrier in accordance with the change in the amplitude of the audio, keeping the amplitude of the carrier constant

99 An aeroplane flies over position A which is due North of a VOR station sited at position B.
The magnetic variation at A is 18°W, and at B is 10°W.
What radial from B is the aircraft on? (1.00 P.)

[A] 018°

[B] 342°

[C] 350°

[D] 010°

100 Two advantages of single side band transmissions are; (1.00 P.)

[A] narrower bandwidth and transmitting power concentrated in two frequencies instead of three

[B] narrower bandwidth and transmitting power concentrated in three frequencies instead of two

[C] broader bandwidth and transmitting power concentrated in two frequencies instead of three

[D] none of the above

101 An aircraft DME receiver does not lock on to its own transmissions reflected from the ground because: (1.00 P.)

[A] DME transmits twin pulses

[B] the pulse recurrence rates are varied

[C] they are not on the receiver frequency

[D] DME uses the UHF band

102 The DME (Distance Measuring Equipment) operates within the following frequencies: (1.00 P.)

[A] 329 to 335 MHz

[B] 962 to 1213 kHz.

[C] 962 to 1213 MHz

[D] 108 to 118 MHz

103 A DME is located at MSL.
An aircraft passing vertically above the station at flight level FL 360 will obtain a DME range of approximately: (1.00 P.)

[A] 8 NM

[B] 11 NM

[C] 6 NM

[D] 7 NM

104 During a flight at FL 210, a pilot does not receive any DME distance indication from a DME station located approximately 220 NM away.
The reason for this is that the: (1.00 P.)

[A] range of a DME system is always less than 200 NM

[B] altitude is too high

[C] aeroplane is below the 'line of sight' altitude

[D] aeroplane is circling around the station

105 When considering factors affecting radio wave propagation it can be said that; (1.00 P.)

[A] as frequency is increased ionospheric attenuation increases

[B] as frequency is increased surface attenuation decreases

[C] as frequency is increased surface attenuation increases

[D] as frequency is increased ionospheric attenuation decreases

106 What is the approximate angular coverage of reliable navigation information for a 3° ILS glide path out to a minimum distance of 10 NM? (1.00 P.)

[A] 1.35° above the horizontal to 5.25° above the horizontal and 8° each side of the localiser centreline

[B] 3° above and below the glide path and 10° each side of the localiser centreline

[C] 0.45° above the horizontal to 1.75° above the glide path and 8° each side of the localiser centreline

[D] 0.7° above and below the glide path and 2.5° each side of the localiser centreline

107 An aircraft is descending down a 6% slope whilst maintaining a G/S of 300 kt. The rate of descent of the aircraft is approximately: (1.00 P.)

[A] 1800 FT/MIN

[B] 3600 FT/MIN

[C] 900 FT/MIN

[D] 10800 FT/MIN

108 Skip distance is the distance between; (1.00 P.)

[A] successive sky wave touchdown points

[B] the transmitter and the first point of sky wave touchdown

[C] the end of the ground wave and the first point of touchdown

[D] the distance of a wave from the surface to the ozonosphere

109 When Mode C is selected on the aircraft SSR transponder the additional information transmitted is: (1.00 P.)

[A] altitude based on regional QNH

[B] flight level based on 1013.25 hPa

[C] height based on QFE

[D] aircraft height based on sub-scale setting

110 Assuming sufficient transmission power, the maximum range of a ground radar with a pulse repetition frequency of 450 pulses per second is: (Given: velocity of light is 300 000 km/second) (1.00 P.)

[A] 1333 km

[B] 333 km

[C] 150 km

[D] 666 km

111 Skip distance is the distance between; (1.00 P.)

[A] the distance of a wave from the surface to the ozonosphere

[B] the transmitter and the first point of sky wave touchdown

[C] successive sky wave touchdown points

[D] the end of the ground wave and the first point of touchdown

112 The duration of civil twilight is the time: (1.00 P.)

[A] agreed by the international aeronautical authorities which is 12 minutes

[B] between sunset and when the centre of the sun is 12° below the true horizon

[C] between sunset and when the centre of the sun is 6° below the true horizon

[D] needed by the sun to move from the apparent height of 0° to the apparent height of 6°

113 On the 27th of February, at 52°S and 040°E, the sunrise is at 0243 UTC.
On the same day, at 52°S and 035°W, the sunrise is at: (1.00 P.)

[A] 0243 UTC

[B] 0523 UTC

[C] 0743 UTC

[D] 2143 UTC

114 An aeroplane flies from A (59°S 142°W) to B (61°S 148°W) with a TAS of 480 kt.
The autopilot is engaged and coupled with an Inertial Navigation System in which AB track is active.
On route AB, the true track: (1.00 P.)

[A] increases by 5°

[B] varies by 4°

[C] varies by 10°

[D] decreases by 6°

115 When using HF communications at night the best frequency is one which is; (1.00 P.)

[A] twice the day frequency

[B] the same as the frequency for day operation

[C] thrice the day frequency

[D] half the day frequency

116 The rhumb-line distance between points A (60°00'N 002°30'E) and B (60°00'N 007°30'W) is: (1.00 P.)

[A] 600 NM

[B] 450 NM

[C] 150 NM

[D] 300 NM

117 An aircraft is over position HO (55°30'N 060°15'W), where YYR VOR (53°30'N 060°15'W) can be received. The magnetic variation is 31°W at HO and 28°W at YYR.
What is the radial from YYR? (1.00 P.)

[A] 028°

[B] 332°

[C] 031°

[D] 208°

118 When using HF communications at night the best frequency is one which is; (1.00 P.)

[A] twice the day frequency

[B] half the day frequency

[C] the same as the frequency for day operation

[D] thrice the day frequency

119 Given:
TAS = 485 kt,
OAT = ISA +10°C,
FL 410.
Calculate the Mach Number? (1.00 P.)

[A] 0.87

[B] 0.90

[C] 0.825

[D] 0.85

120 An aircraft at FL100 should be able to communicate with a VHF ground station at 100 ft amsl at an approximate maximum range of (1.00 P.)

[A] 137.5 nm

[B] 25 nm

[C] 112.5 nm

[D] 123.2 nm

121 060-001.jpg
Assume a North polar stereographic chart whose grid is aligned with the Greenwich meridian.
An aircraft flies from the geographic North pole for a distance of 480 NM along the 110°E meridian, then follows a grid track of 154° for a distance of 300 NM.
Its position is now approximately: (1.00 P.)

Siehe Anlage 1

[A] 78°45'N 087°E

[B] 70°15'N 080°E

[C] 80°00'N 080°E

[D] 79°15'N 074°E

122 Given:
A polar stereographic chart whose grid is aligned with the zero meridian.
Grid track 344°,
Longitude 115°00'W,
Calculate the true course? (1.00 P.)

[A] 049°

[B] 279°

[C] 099°

[D] 229°

123 The ionosphere is split into three distinct layers during day time which are; (1.00 P.)

[A] E layer, Appleton layer, F layer

[B] D layer, Appleton layer, F layer

[C] E layer, Kennelley Heaviside layer, D layer

[D] D layer, Kennelley Heaviside layer , Appleton layer

124 060-002.jpg
1300 UTC DR position 37°30'N 021°30'W alter heading
PORT SANTO NDB (33°03'N 016°23'W)
TAS 450 kt,
Forecast W/V 360°/30kt.
Calculate the ETA at PORT SANTO NDB? (1.00 P.)

Siehe Anlage 2

[A] 1344

[B] 1341

[C] 1354

[D] 1348

125 For a distance of 1860 NM between Q and R, a ground speed "out" of 385 kt, a ground speed "back" of 465 kt and an endurance of 8 HR (excluding reserves) the distance from Q to the point of safe return (PSR) is: (1.00 P.)

[A] 1532 NM

[B] 1865 NM

[C] 1685 NM

[D] 930 NM

126 The aircraft aerial(s) used to determine the direction of an NDB beacon is/are (1.00 P.)

[A] sense aerial

[B] loop and sense aerials

[C] omni-directional aerials

[D] loop aerial

127 Two points A and B are 1000 NM apart. TAS = 490 kt.
On the flight between A and B the equivalent headwind is -20 kt.
On the return leg between B and A, the equivalent headwind is +40 kt.
What distance from A, along the route A to B, is the Point of Equal Time (PET)? (1.00 P.)

[A] 455 NM

[B] 470 NM

[C] 530 NM

[D] 500 NM

128 Given:
AD = Air distance
GD = Ground distance
TAS = True Airspeed
GS = Groundspeed
Which of the following is the correct formula to calculate ground distance (GD) gone? (1.00 P.)

[A] GD = (AD - TAS)/TAS

[B] GD = TAS/(GS X AD)

[C] GD = (AD X GS)/TAS

[D] GD = AD X (GS -TAS)/GS

129 An aircraft is flying with the aid of an inertial navigation system (INS) connected to the autopilot. The following two points have been entered in the INS computer:
WPT 1: 60°N 030°W
WPT 2: 60°N 020°W
When 025°W is passed the latitude shown on the display unit of the inertial navigation system will be: (1.00 P.)

[A] 60°11.0'N

[B] 60°00.0'N

[C] 59°49.0'N

[D] 60°05.7'N

130 The drift of the azimuth gyro on an inertial unit induces an error in the position given by this unit. "t" being the elapsed time.
The total error is: (1.00 P.)

[A] proportional to t/2

[B] sinusoîdal

[C] proportional to the square of time, t^2

[D] proportional to t

131 When determining the direction of an NDB station, the 180? ambiguity is resolved by using a; (1.00 P.)

[A] loop aerial

[B] sense aerial and then a loop aerial

[C] guyed aerial

[D] sense aerial

132 With reference to inertial navigation systems, a TAS input is: (1.00 P.)

[A] required for Polar navigation

[B] not required

[C] required for rhumb line navigation

[D] required to provide a W/V read out

133 The platform of an inertial navigation system (INS) is maintained at right angles to the local vertical by applying corrections for the effects of: (1.00 P.)

[A] movement in the yawing plane, secondary precession and pendulous oscillation

[B] aircraft manoeuvres, earth rotation, transport wander and coriolis

[C] vertical velocities, earth precession, centrifugal forces and transport drift

[D] gyroscopic inertia, earth rotation and real drift

134 An aircraft travels from point A to point B, using the autopilot connected to the aircraft's inertial system. The coordinates of A (45°S 010°W) and B (45°S 030°W) have been entered.
The true course of the aircraft on its arrival at B, to the nearest degree, is: (1.00 P.)

[A] 263°

[B] 277°

[C] 284°

[D] 270°

135 NDB bearings displayed on an ADF are relative bearings with reference to; (1.00 P.)

[A] true North

[B] magnetic North

[C] aircraft track

[D] aircraft heading

136 Some inertial reference and navigation systems are known as "strapdown". This means that: (1.00 P.)

[A] gyros and accelerometers are mounted on a stabilised platform in the aircraft

[B] the gyroscopes and accelerometers become part of the unit's fixture to the aircraft structure

[C] only the gyros, and not the accelerometers, become part of the unit's fixture to the aircraft structure

[D] gyros and accelerometers need satellite information input to obtain a vertical reference

137 As the INS position of the departure aerodrome, coordinates 35°32.7'N 139°46.3'W are input instead of 35°32.7'N 139°46.3'E. When the aircraft subsequently passes point 52°N 180°W, the longitude value shown on the INS will be: (1.00 P.)

[A] 080° 27.4'W

[B] 080° 27.4'E

[C] 099° 32.6'W

[D] 099° 32.6'E

138 In order to maintain an accurate vertical using a pendulous system, an aircraft inertial platform incorporates a device: (1.00 P.)

[A] without damping and a period of 84.4 MIN

[B] without damping and a period of 84.4 SEC

[C] with damping and a period of 84.4 SEC

[D] with damping and a period of 84.4 MIN

139 The cardoid polar diagram resulting from the resolution of the 180? ambiguity has; (1.00 P.)

[A] two nulls and one maximum, giving the direction of the station

[B] two maxima and non nulls

[C] one null giving the direction of the station

[D] four nulls

140 What is the approximate maximum theoretical range at which an aircraft at FL130 could receive information from a VDF facility which is sited 1024 FT above MSL? (1.00 P.)

[A] 220 NM

[B] 150 NM

[C] 180 NM

[D] 120 NM

141 In ISA conditions, what is the maximum theoretical range at which an aircraft at FL80 can expect to obtain bearings from a ground VDF facility sited 325 ft above MSL ? (1.00 P.)

[A] 158 NM

[B] 114 NM

[C] 107 NM

[D] 134 NM

142 The aerials used when an ADF operates on "Automatic Direction Finding" are; (1.00 P.)

[A] loop and sense aerials together

[B] loop aerial only

[C] sense aerial only

[D] omni-directional aerials

143 A radio beacon has an operational range of 10 NM. By what factor should the transmitter power be increased in order to achieve an operational range of 20 NM? (1.00 P.)

[A] Four

[B] Eight

[C] Two

[D] Six

144 'Night Effect' which causes loss of signal and fading, resulting in bearing errors from NDB transmissions, is due to: (1.00 P.)

[A] skywave distortion of the null position and is maximum at dawn and dusk

[B] static activity increasing at night particularly in the lower frequency band

[C] the effect of the Aurora Borealis

[D] interference from other transmissions and is maximum at dusk when east of the NDB

145 Quadrantal errors associated with aircraft Automatic Direction Finding (ADF) equipment are caused by: (1.00 P.)

[A] signal bending caused by electrical interference from aircraft wiring

[B] skywave/groundwave contamination

[C] misalignment of the loop aerial

[D] signal bending by the aircraft metallic surfaces

146 Errors caused by the effect of coastal refraction on bearings at lower altitudes are maximum when the NDB is: (1.00 P.)

[A] near the coast and the bearing crosses the coast at an acute angle

[B] near the coast and the bearing crosses the coast at right angles

[C] inland and the bearing crosses the coast at an acute angle

[D] inland and the bearing crosses the coast at right angles

147 The four factors affecting the accuracy of NDB's are; (1.00 P.)

[A] quadrantal error, mountain effect, night effect and static interference

[B] quandrantal error,night effect, pilotage error and aggregate error

[C] thunderstorm effect, night effect, slant range error,and station interference

[D] all of the options.

148 The principle used in VOR bearing measurement is: (1.00 P.)

[A] beat frequency discrimination

[B] phase comparison

[C] difference in depth of modulation

[D] envelope matching

149 Which frequency band is used by VOR transmissions? (1.00 P.)

[A] SHF

[B] VHF

[C] HF

[D] UHF

150 Precautions to reduce the effect of night effect on ADF bearings are to; (1.00 P.)

[A] use the transmitter/receiver intermittently by switching "on" and "off"

[B] choose the nearest station and only use the ADF within one hour of sunrise and sunset

[C] avoid use the ADF within one hour of sunrise and sunset and use a weaker beacon to eliminate skywaves

[D] use a more powerfull beacon and bearings taken well within the surface wave range

151 Transmissions from VOR facilities may be adversely affected by: (1.00 P.)

[A] uneven propagation over irregular ground surfaces

[B] night effect

[C] quadrantal error

[D] static interference

152 If VOR bearing information is used beyond the published protection range, errors could be caused by: (1.00 P.)

[A] interference from other transmitters

[B] noise from precipitation static exceeding the signal strength of the transmitter

[C] sky wave interference from the same transmitter

[D] sky wave interference from distant transmitters on the same frequency

153 An aircraft is 100 NM from a VOR facility. Assuming no error when using a deviation indicator where 1 dot = 2° deviation, how many dots deviation from the centre line of the instrument will represent the limits of the airway boundary? (Assume that the airway is 10 NM wide) (1.00 P.)

[A] 3.0

[B] 4.5

[C] 6.0

[D] 1.5

154 An airway 10 NM wide is to be defined by two VORs each having a resultant bearing accuracy of plus or minus 5.5°.
In order to ensure accurate track guidance within the airway limits the maximum distance apart for the transmitter is approximately: (1.00 P.)

[A] 210 NM

[B] 105 NM

[C] 50 NM

[D] 165 NM

155 The time between two relative bearings of 075 and 090 is 7 minutes 45 seconds and groundspeed is 130 kts. The time and distance to the beacon is; (1.00 P.)

[A] 67.2 minutes - 31 nm

[B] 31 minutes - 67.2 nm

[C] 150.7 minutes - 50.5 nm

[D] 116.1 minutes - 251.6 nm

156 An aircraft is required to approach a VOR via the 104° radial. Which of the following settings should be made on the VOR/ILS deviation indicator? (1.00 P.)

[A] 104° with the FROM flag showing

[B] 284° with the TO flag showing

[C] 104° with the TO flag showing

[D] 284° with the FROM flag showing

157 The time between two relative bearings of 075 and 090 is 7 minutes 45 seconds and groundspeed is 130 kts. The time and distance to the beacon is; (1.00 P.)

[A] 116.1 minutes - 251.6 nm

[B] 67.2 minutes - 31 nm

[C] 31 minutes - 67.2 nm

[D] 150.7 minutes - 50.5 nm

158 An aircraft, on a heading of 180°M is on a bearing of 270°M from a VOR. The bearing you should select on the OMNI bearing selector to centralise the VOR/ILS left/right deviation needle is: (1.00 P.)

[A] 090°

[B] 270°

[C] 360°

[D] 180°

159 An aircraft is required to approach a VOR station via the 244° radial. In order to obtain correct sense indications the deviation indicator should be set to: (1.00 P.)

[A] 244° with the TO flag showing

[B] 064° with the TO flag showing

[C] 244° with the FROM flag showing

[D] 064° with the FROM flag showing

160 What is the maximum theoretical range that an aircraft at FL150 can receive signals from a VOR situated 609 feet above MSL? (1.00 P.)

[A] 220 NM

[B] 147 NM

[C] 156 NM

[D] 184 NM

161 An aircraft heading 200?M receives a bearing of 190R from an NDB. ATC instructs the pilot to intercept the 250 QDR outbound from the NDB at 30?. The intercept heading and the relative bearing at intercept are; (1.00 P.)

[A] 280?M/150

[B] 280?M/330

[C] 220?M/210

[D] 220?M/160

162 A typical frequency employed in Distance Measuring Equipment (DME) is: (1.00 P.)

[A] 1000 MHz

[B] 100 MHz

[C] 10 MHz

[D] 100 GHz

163 Distance Measuring Equipment (DME) operates in the: (1.00 P.)

[A] VHF band and uses the principle of phase comparison

[B] UHF band and uses one frequency

[C] SHF band and uses frequency modulation techniques

[D] UHF band and uses two frequencies

164 An aircraft on a constant heading with 8? right drift is tracking parallel to and 5 nm left of the centre line of an airway. The ADF reading of an NDB on the centre line 42 nm ahead is; (1.00 P.)

[A] 286?R

[B] 011?R

[C] 359?R

[D] 015?R

165 For a conventional DME facility 'Beacon Saturation' will occur whenever the number of aircraft interrogations exceeds: (1.00 P.)

[A] 100

[B] 80

[C] 60

[D] 200

166 An aircraft on a constant heading with 8? right drift is tracking parallel to and 5 nm left of the centre line of an airway. The ADF reading of an NDB on the centre line 42 nm ahead is; (1.00 P.)

[A] 015?R

[B] 011?R

[C] 359?R

[D] 286?R

167 The aircraft DME receiver is able to accept replies to its own transmissions and reject replies to other aircraft interrogations because: (1.00 P.)

[A] aircraft interrogation signals and transponder responses are 63 MHz removed from each other

[B] pulse pairs are amplitude modulated with the aircraft registration

[C] the time interval between pulse pairs is unique to that particular aircraft

[D] transmission frequencies are 63 MHz different for each aircraft

168 The aircraft DME receiver cannot lock on to interrogation signals reflected from the ground because: (1.00 P.)

[A] reflections are subject to doppler frequency shift

[B] DME transmits twin pulses

[C] DME pulse recurrence rates are varied

[D] aircraft transmitter and DME ground station are transmitting on different frequencies

169 An aircraft is tracking 065?T, variation 22?W and drift 9? right with an ADF indication of 237?R. The aircraft heading and indication on an RMI are; (1.00 P.)

[A] heading 078?M/315?

[B] heading 088?M/326

[C] heading 096?M/333?

[D] heading 034?M/271?

170 The design requirements for DME stipulate that, at a range of 100 NM, the maximum systematic error should not exceed: (1.00 P.)

[A] + or - 0.25 NM

[B] + or - 1.5 NM

[C] + or - 1.25 NM

[D] + or - 3 NM

171 In which situation will speed indications on an airborne Distance Measuring Equipment (DME) most closely represent the groundspeed of an aircraft flying at FL400? (1.00 P.)

[A] When overhead the station, with no change of heading at transit

[B] When passing abeam the station and within 5 NM of it

[C] When tracking directly towards the station at a range of 100 NM or more

[D] When tracking directly away from the station at a range of 10 NM

172 In order to maintain a track of 165?T away from an NDB (variation 16?W) with a drift 8? left, the ADF reading required is; (1.00 P.)

[A] 188? relative

[B] 352? relative

[C] 172? relative

[D] 259? relative

173 The time taken for the transmission of an interrogation pulse by a Distance Measuring Equipment (DME) to travel to the ground transponder and return to the airborne receiver was 2000 micro-second, including time delay. The slant range from the ground transponder was: (1.00 P.)

[A] 330 NM

[B] 296 NM

[C] 158 NM

[D] 186 NM

174 The reason why pre take-off holding areas are sometimes further from the active runway when ILS Category 2 and 3 landing procedures are in progress than during good weather operations is: (1.00 P.)

[A] heavy precipitation may disturb guidance signals

[B] aircraft manoeuvring near the runway may disturb guidance signals

[C] to increase aircraft separation in very reduced visibility conditions

[D] to increase distance from the runway during offset approach operations

175 Which of the following correctly describes the Instrument Landing System (ILS) localiser radiation pattern? (1.00 P.)

[A] Two overlapping lobes on the same VHF carrier frequency

[B] A pencil beam comprising a series of smaller beams each carrying a different modulation

[C] Two overlapping lobes on different radio carrier frequencies but with the same modulation

[D] Two overlapping lobes on the same UHF carrier frequency

176 The principle of operation of a VOR is bearing measurement by; (1.00 P.)

[A] modulation comparison

[B] phase comparison

[C] polarisation comparison

[D] de-modulation comparison

177 An aircraft tracking to intercept the Instrument Landing System (ILS) localiser inbound on the approach side, outside the published ILS coverage angle: (1.00 P.)

[A] only glide path information is available

[B] may receive false course indications

[C] will receive signals without identification coding

[D] can expect signals to give correct indications

178 The MIDDLE MARKER of an Instrument Landing System (ILS) facility is identified audibly and visually by a series of: (1.00 P.)

[A] two dashes per second and a blue light flashing

[B] dots and a white light flashing

[C] dashes and an amber light flashing

[D] alternate dots and dashes and an amber light flashing

179 The OUTER MARKER of an Instrument Landing System (ILS) facility transmits on a frequency of: (1.00 P.)

[A] 200 MHz and is modulated by alternate dot/dash in morse

[B] 75 MHz and is modulated by alternate dot/dash in morse

[C] 75 MHz and is modulated by morse at two dashes per second

[D] 300 MHz and is modulated by morse at two dashes per second

180 The two modulations from which bearing information is obtained in a VOR are (1.00 P.)

[A] reference signal frequency modulated and directional signal apparent amplitude modulated

[B] reference signal apparent amplitude modulated and directional signal frequency modulated

[C] both frequency modulated at the transmitter

[D] none of the options are correct

181 What approximate rate of descent is required in order to maintain a 3° glide path at a groundspeed of 120 kt? (1.00 P.)

[A] 550 FT/MIN

[B] 950 FT/MIN

[C] 800 FT/MIN

[D] 600 FT/MIN

182 The outer marker of an ILS with a 3° glide slope is located 4.6 NM from the threshold. Assuming a glide slope height of 50 FT above the threshold, the approximate height of an aircraft passing the outer marker is: (1.00 P.)

[A] 1350 FT

[B] 1300 FT

[C] 1450 FT

[D] 1400 FT

183 Airborne weather radar systems use a wavelength of approximately 3 cm in order to: (1.00 P.)

[A] obtain optimum use of the Cosecant squared beam

[B] transmit at a higher pulse repetition frequency for extended range

[C] detect the smaller cloud formations as well as large

[D] detect the larger water droplets

184 The VOR frequency range is; (1.00 P.)

[A] 108 - 112 MHz

[B] 108 - 136 MHz

[C] 108 - 118 MHz

[D] 106 - 136 MHz

185 The frequency which corresponds to a wavelength of 12 cm is: (1.00 P.)

[A] 2500 kHz.

[B] 3600 MHz.

[C] 360 MHz.

[D] 2500 MHz.

186 The frequency which corresponds to a wavelength of 12 cm is: (1.00 P.)

[A] 360 MHz.

[B] 2500 kHz.

[C] 3600 MHz.

[D] 2500 MHz.

187 The ISO-ECHO facility of an airborne weather radar is provided in order to: (1.00 P.)

[A] detect areas of possible severe turbulence in cloud

[B] inhibit unwanted ground returns

[C] give an indication of cloud tops

[D] extend the mapping range

188 The wavelength of a radio signal transmitted at the frequency of 75 MHz is: (1.00 P.)

[A] 7.5 m.

[B] 75 m.

[C] 40 m.

[D] 4 m.

189 In the MAPPING MODE the airborne weather radar utilises a: (1.00 P.)

[A] pencil beam effective from zero to 150 NM

[B] fan shaped beam effective up to a range of 150 NM

[C] fan shaped beam effective up to a maximum of 50 NM to 60 NM range

[D] pencil beam to a maximum range of 60 NM

190 The wavelength of a radio signal transmitted at the frequency 118.7 MHz is: (1.00 P.)

[A] 25.3 cm.

[B] 2.53 m.

[C] 25.3 m.

[D] 2.53 cm.

191 Which of the following cloud types is most readily detected by airborne weather radar when using the 'weather beam'? (1.00 P.)

[A] cumulus

[B] cirrocumulus

[C] altostratus

[D] stratus

192 Why is a secondary radar display screen free of storm clutter? (1.00 P.)

[A] The principle of 'echo' return is not used in secondary radar

[B] The frequencies employed are too high to give returns from moisture sources

[C] A moving target indicator facility suppresses the display of static or near static returns

[D] The frequencies employed are too low to give returns from moisture sources

193 If the directional signal leads the reference signal by 30? the magnetic bearing to the VOR station will be (1.00 P.)

[A] 30?

[B] 210?

[C] 150?

[D] 330?

194 In order to indicate radio failure the aircraft SSR transponder should be selected to code: (1.00 P.)

[A] 7700

[B] 7000

[C] 7600

[D] 7500

195 In order to indicate unlawful interference with the planned operation of the flight, the aircraft Secondary Surveillance Radar (SSR) transponder should be selected to: (1.00 P.)

[A] 7000

[B] 7700

[C] 7600

[D] 7500

196 With an omni-selector of 090? on a VOR indicator and the directional phase lagging the reference pahse by 280°, the VOR indicator will show (1.00 P.)

[A] fly right - FROM

[B] fly left - TO

[C] fly right -- FROM

[D] fly right - TO

197 A ground feature appears 30° to the left of the centre line of the CRT of an airborne weather radar. If the heading of the aircraft is 355° (M) and the magnetic variation is 15° East, the true bearing of the aircraft from the feature is: (1.00 P.)

[A] 130°

[B] 160°

[C] 220°

[D] 310°

198 An apparent increase in the transmitted frequency in doppler which is proportional to the transmitter velocity will occur when: (1.00 P.)

[A] the receiver moves towards the transmitter

[B] both transmitter and receiver move towards each other

[C] the transmitter moves towards the receiver

[D] the transmitter moves away from the receiver

199 Which is the highest latitude listed below at which the sun will rise above the horizon and set every day? (1.00 P.)

[A] 68°

[B] 66°

[C] 62°

[D] 72°

200 060-003.jpg
The UTC of sunrise on 6 December at WINNIPEG (Canada) (49°50'N 097°30'W) is: (1.00 P.)

Siehe Anlage 3

[A] 1413

[B] 2230

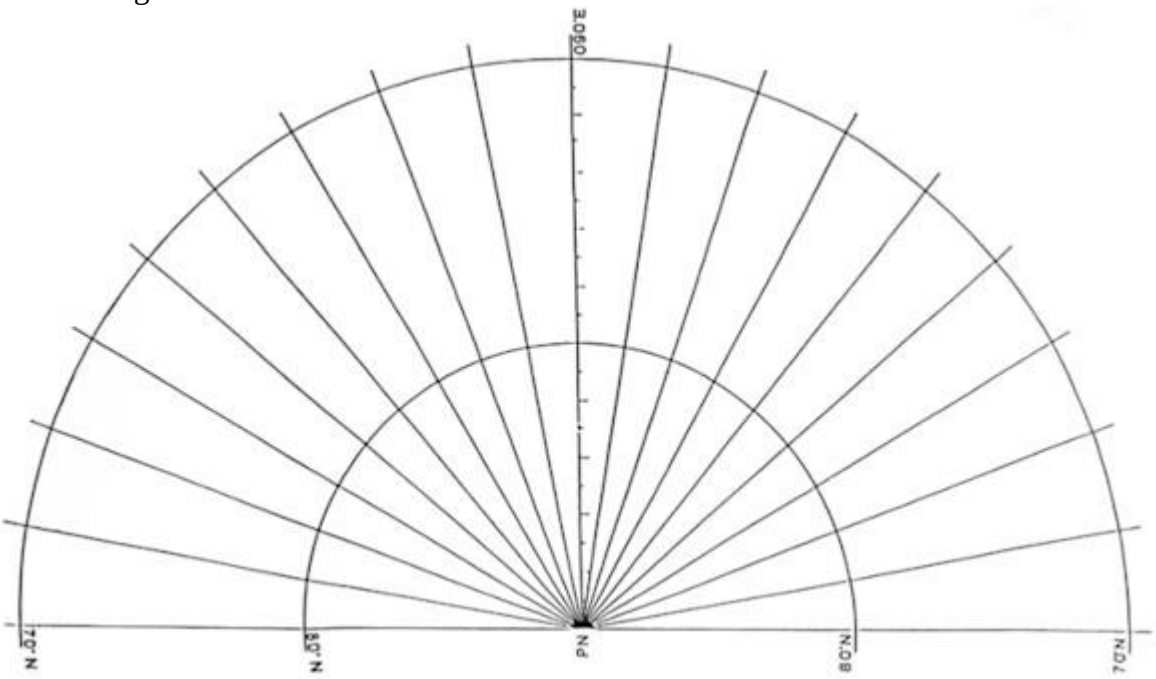
[C] 0113

[D] 0930

Anlagen zu den Aufgaben

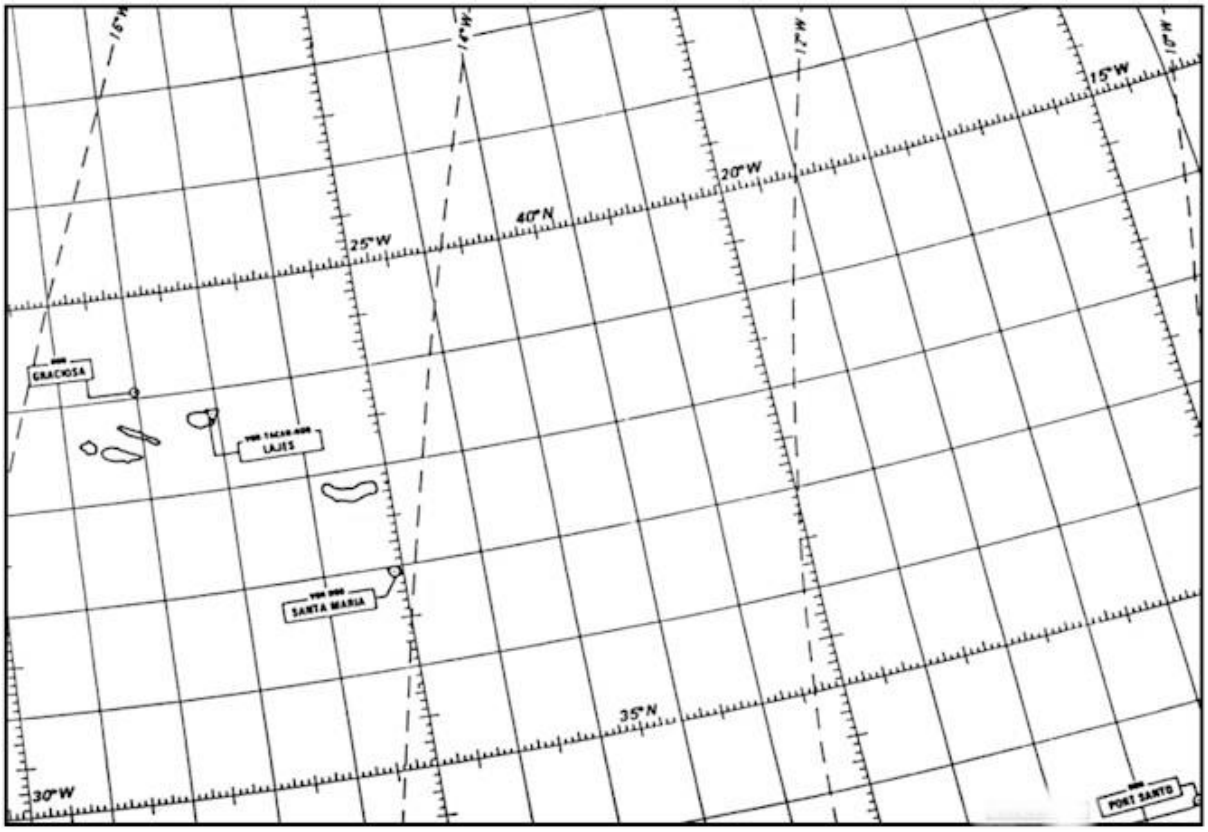
Anlage 1 zu Aufgabe 121

Titel: Anlage 1



Anlage 2 zu Aufgabe 124

Titel: Anlage 1



Anlagen zu den Aufgaben

Anlage 3 zu Aufgabe 200

Titel: Anlage 1

A86

SUNRISE

Lat.	November				December											Jan.
	19	22	25	28	1	4	7	10	13	16	19	22	25	28	31	3
°	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
N 72	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬
70	10 14	10 40	11 19	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬
68	09 30	09 45	10 00	10 16	10 33	10 52	11 14	▬	▬	▬	▬	▬	▬	▬	▬	▬
66	09 01	09 12	09 23	09 34	09 45	09 55	10 05	10 14	10 22	10 28	10 32	10 35	10 35	10 33	10 30	10 25
64	08 39	08 48	08 57	09 06	09 15	09 23	09 30	09 36	09 42	09 47	09 50	09 52	09 53	09 52	09 51	09 48
62	21	29	37	08 45	08 52	08 59	09 05	09 10	09 15	09 19	22	24	24	24	23	22
N 60	08 07	08 14	08 21	08 28	08 34	08 40	08 45	08 50	08 54	08 58	09 00	09 02	09 03	09 03	09 03	09 01
58	07 54	08 01	08 07	13	19	24	29	33	37	40	08 43	08 45	08 46	08 46	08 46	08 45
56	43	07 49	07 55	08 01	08 06	08 11	15	19	23	26	28	30	31	32	32	31
54	34	40	45	07 50	07 55	07 59	08 03	08 07	08 10	13	15	17	19	19	19	19
52	26	31	36	40	45	49	07 53	07 56	07 59	08 02	08 04	08 06	08 07	08 08	08 08	08 08
N 50	07 18	07 23	07 28	07 32	07 36	07 40	07 43	07 47	07 50	07 52	07 54	07 56	07 57	07 58	07 59	07 58
45	07 02	07 06	07 10	07 14	17	21	24	27	29	32	34	35	37	38	38	38
40	06 49	06 53	06 56	06 59	07 02	07 05	07 08	07 10	07 13	15	17	18	20	21	22	22
35	38	41	44	46	06 49	06 52	06 54	06 57	06 59	07 01	07 03	07 04	07 06	07 07	07 08	07 08
30	28	30	33	35	38	40	43	45	47	06 49	06 50	06 52	06 53	06 54	06 55	06 56
N 20	06 11	06 13	06 15	06 16	06 18	06 20	06 22	06 24	06 26	06 28	06 29	06 31	06 32	06 33	06 35	06 36
N 10	05 56	05 57	05 58	06 00	06 01	06 03	06 04	06 06	06 07	06 09	06 10	06 12	06 13	06 15	06 16	17
0	42	42	43	05 44	05 45	05 46	05 48	05 49	05 50	05 52	05 53	05 55	05 56	05 58	05 59	06 01
S 10	28	28	28	28	29	30	31	32	33	34	35	37	39	40	42	05 43
20	05 12	05 12	05 11	05 11	05 12	05 12	05 13	05 13	05 14	05 15	05 17	05 18	05 20	05 21	23	25
S 30	04 54	04 53	04 52	04 52	04 51	04 51	04 51	04 52	04 52	04 53	04 55	04 56	04 58	04 59	05 01	05 03
35	44	42	41	40	39	39	39	39	40	41	42	43	45	46	04 48	04 51
40	32	30	28	27	26	25	25	25	25	26	27	28	29	31	34	36
45	18	04 15	04 13	04 11	04 09	04 08	04 07	04 07	04 07	04 08	04 08	04 10	04 11	04 13	04 16	04 19
50	04 00	03 57	03 54	03 51	03 49	03 47	03 46	03 45	03 45	03 45	03 46	03 47	03 49	03 51	03 54	03 57
S 52	03 52	03 48	03 45	03 42	03 39	03 37	03 36	03 35	03 34	03 34	03 35	03 36	03 38	03 40	03 43	03 46
54	43	39	35	31	29	26	24	23	22	22	23	24	26	28	31	34
56	32	28	23	19	16	03 13	03 11	03 09	03 09	03 08	03 09	03 10	03 12	03 14	17	21
58	21	15	03 10	03 06	03 02	02 58	02 55	02 53	02 52	02 52	02 52	02 53	02 55	02 57	03 01	03 05
S 60	03 06	03 00	02 54	02 49	02 44	02 40	02 37	02 34	02 32	02 31	02 31	02 32	02 34	02 37	02 41	02 45

SUNSET

Lat.	November				December											Jan.
	19	22	25	28	1	4	7	10	13	16	19	22	25	28	31	3
°	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
N 72	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬
70	13 15	12 51	12 13	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬
68	14 00	13 47	13 33	13 19	13 04	12 47	12 27	▬	▬	▬	▬	▬	▬	▬	▬	▬
66	29	14 19	14 10	14 01	13 52	13 44	13 37	13 30	13 26	13 22	13 21	13 21	13 24	13 29	13 35	13 43
64	14 51	14 43	36	29	14 22	14 17	14 12	14 08	14 05	14 04	14 03	14 04	14 06	14 10	14 15	14 21
62	15 09	15 02	14 56	14 50	14 45	14 41	37	34	32	31	32	33	35	38	14 42	14 47
N 60	15 23	15 18	15 12	15 08	15 03	15 00	14 57	14 55	14 54	14 53	14 53	14 55	14 57	14 59	15 03	15 07
58	36	31	26	22	19	16	15 13	15 12	15 11	15 10	15 11	15 12	15 14	15 17	20	24
56	46	42	38	35	32	29	27	26	25	25	26	27	29	31	34	38
54	15 56	15 52	48	45	43	41	39	38	38	38	39	40	42	44	47	15 50
52	16 04	16 01	15 58	15 55	15 53	15 51	50	49	48	49	49	15 51	15 52	15 55	15 58	16 01
N 50	16 12	16 09	16 06	16 03	16 01	16 00	15 59	15 58	15 58	15 58	15 59	16 01	16 02	16 05	16 07	16 10
45	28	26	24	22	21	20	16 19	16 19	16 19	16 19	16 20	21	23	25	28	30
40	41	39	38	37	36	35	35	35	35	36	37	38	40	42	44	16 47
35	16 53	16 51	16 50	16 49	16 49	16 48	16 48	16 48	16 49	16 50	16 51	16 52	16 54	16 56	16 58	17 00
30	17 03	17 01	17 01	17 00	17 00	17 00	17 00	17 01	17 01	17 02	17 04	17 05	17 07	17 09	17 10	13
N 20	17 20	17 19	17 19	17 19	17 19	17 20	17 20	17 21	17 22	17 23	17 25	17 26	17 28	17 29	17 31	17 33
N 10	35	35	35	36	37	37	38	39	41	42	17 43	17 45	17 46	17 48	17 50	17 51
0	17 49	17 50	17 51	17 52	17 53	17 54	17 55	17 56	17 58	17 59	18 01	18 02	18 04	18 05	18 07	18 08
S 10	18 03	18 05	18 06	18 07	18 09	18 10	18 12	18 14	18 15	18 17	18	20	21	23	24	25
20	19	21	23	25	26	28	30	32	34	36	37	18 39	18 40	18 41	18 43	18 44
S 30	18 37	18 39	18 42	18 44	18 47	18 49	18 51	18 54	18 56	18 58	18 59	19 01	19 02	19 03	19 04	19 05
35	47	18 50	18 53	18 56	18 59	19 02	19 04	19 06	19 09	19 11	19 12	14	15	16	17	18
40	18 59	19 03	19 06	19 09	19 13	16	18	21	23	26	27	29	30	31	32	32
45	19 14	18	22	25	29	32	36	19 39	19 41	19 44	19 45	19 47	19 48	19 49	19 50	19 50
50	31	36	41	45	50	19 54	19 57	20 01	20 03	20 06	20 08	20 10	20 11	20 12	20 12	20 11
S 52	19 40	19 45	19 50	19 55	19 59	20 04	20 07	20 11	20 14	20 17	20 19	20 21	20 22	20 22	20 22	20 22
54	19 49	19 55	20 00	20 05	20 10	15	19	23	26	29	31	33	34	34	34	34
56	20 00	20 06	12	18	23	28	33	37	40	20 43	20 45	20 47	20 48	20 49	20 48	20 47
58	12	19	25	32	38	20 43	20 48	20 53	20 57	21 00	21 02	21 04	21 05	21 05	21 05	21 03
S 60	20 26	20 34	20 41	20 48	20 55	21 01	21 07	21 12	21 17	21 20	21 23	21 25	21 25	21 25	21 24	21 22

Vom Teilnehmer auszufüllen	
Name:	**Prüf.-Nr.:**
Prüfungsdatum:	**Unterschrift**

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**
22.	**A**	**B**	**C**	**D**	**23.**	**A**	**B**	**C**	**D**	**24.**	**A**	**B**	**C**	**D**
25.	**A**	**B**	**C**	**D**	**26.**	**A**	**B**	**C**	**D**	**27.**	**A**	**B**	**C**	**D**
28.	**A**	**B**	**C**	**D**	**29.**	**A**	**B**	**C**	**D**	**30.**	**A**	**B**	**C**	**D**
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**
37.	**A**	**B**	**C**	**D**	**38.**	**A**	**B**	**C**	**D**	**39.**	**A**	**B**	**C**	**D**
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**
55.	**A**	**B**	**C**	**D**	**56.**	**A**	**B**	**C**	**D**	**57.**	**A**	**B**	**C**	**D**
58.	**A**	**B**	**C**	**D**	**59.**	**A**	**B**	**C**	**D**	**60.**	**A**	**B**	**C**	**D**
61.	**A**	**B**	**C**	**D**	**62.**	**A**	**B**	**C**	**D**	**63.**	**A**	**B**	**C**	**D**
64.	**A**	**B**	**C**	**D**	**65.**	**A**	**B**	**C**	**D**	**66.**	**A**	**B**	**C**	**D**

Vom Teilnehmer auszufüllen	
Name:	**Prüf.-Nr.:**
Prüfungsdatum:	**Unterschrift**

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**
73.	**A**	**B**	**C**	**D**	**74.**	**A**	**B**	**C**	**D**	**75.**	**A**	**B**	**C**	**D**
76.	**A**	**B**	**C**	**D**	**77.**	**A**	**B**	**C**	**D**	**78.**	**A**	**B**	**C**	**D**
79.	**A**	**B**	**C**	**D**	**80.**	**A**	**B**	**C**	**D**	**81.**	**A**	**B**	**C**	**D**
82.	**A**	**B**	**C**	**D**	**83.**	**A**	**B**	**C**	**D**	**84.**	**A**	**B**	**C**	**D**
85.	**A**	**B**	**C**	**D**	**86.**	**A**	**B**	**C**	**D**	**87.**	**A**	**B**	**C**	**D**
88.	**A**	**B**	**C**	**D**	**89.**	**A**	**B**	**C**	**D**	**90.**	**A**	**B**	**C**	**D**
91.	**A**	**B**	**C**	**D**	**92.**	**A**	**B**	**C**	**D**	**93.**	**A**	**B**	**C**	**D**
94.	**A**	**B**	**C**	**D**	**95.**	**A**	**B**	**C**	**D**	**96.**	**A**	**B**	**C**	**D**
97.	**A**	**B**	**C**	**D**	**98.**	**A**	**B**	**C**	**D**	**99.**	**A**	**B**	**C**	**D**
100.	**A**	**B**	**C**	**D**	**101.**	**A**	**B**	**C**	**D**	**102.**	**A**	**B**	**C**	**D**
103.	**A**	**B**	**C**	**D**	**104.**	**A**	**B**	**C**	**D**	**105.**	**A**	**B**	**C**	**D**
106.	**A**	**B**	**C**	**D**	**107.**	**A**	**B**	**C**	**D**	**108.**	**A**	**B**	**C**	**D**
109.	**A**	**B**	**C**	**D**	**110.**	**A**	**B**	**C**	**D**	**111.**	**A**	**B**	**C**	**D**
112.	**A**	**B**	**C**	**D**	**113.**	**A**	**B**	**C**	**D**	**114.**	**A**	**B**	**C**	**D**
115.	**A**	**B**	**C**	**D**	**116.**	**A**	**B**	**C**	**D**	**117.**	**A**	**B**	**C**	**D**
118.	**A**	**B**	**C**	**D**	**119.**	**A**	**B**	**C**	**D**	**120.**	**A**	**B**	**C**	**D**
121.	**A**	**B**	**C**	**D**	**122.**	**A**	**B**	**C**	**D**	**123.**	**A**	**B**	**C**	**D**
124.	**A**	**B**	**C**	**D**	**125.**	**A**	**B**	**C**	**D**	**126.**	**A**	**B**	**C**	**D**
127.	**A**	**B**	**C**	**D**	**128.**	**A**	**B**	**C**	**D**	**129.**	**A**	**B**	**C**	**D**
130.	**A**	**B**	**C**	**D**	**131.**	**A**	**B**	**C**	**D**	**132.**	**A**	**B**	**C**	**D**

Vom Teilnehmer auszufüllen	
Name:	**Prüf.-Nr.:**
Prüfungsdatum:	**Unterschrift**

133.	A	B	C	D	134.	A	B	C	D	135.	A	B	C	D
136.	A	B	C	D	137.	A	B	C	D	138.	A	B	C	D
139.	A	B	C	D	140.	A	B	C	D	141.	A	B	C	D
142.	A	B	C	D	143.	A	B	C	D	144.	A	B	C	D
145.	A	B	C	D	146.	A	B	C	D	147.	A	B	C	D
148.	A	B	C	D	149.	A	B	C	D	150.	A	B	C	D
151.	A	B	C	D	152.	A	B	C	D	153.	A	B	C	D
154.	A	B	C	D	155.	A	B	C	D	156.	A	B	C	D
157.	A	B	C	D	158.	A	B	C	D	159.	A	B	C	D
160.	A	B	C	D	161.	A	B	C	D	162.	A	B	C	D
163.	A	B	C	D	164.	A	B	C	D	165.	A	B	C	D
166.	A	B	C	D	167.	A	B	C	D	168.	A	B	C	D
169.	A	B	C	D	170.	A	B	C	D	171.	A	B	C	D
172.	A	B	C	D	173.	A	B	C	D	174.	A	B	C	D
175.	A	B	C	D	176.	A	B	C	D	177.	A	B	C	D
178.	A	B	C	D	179.	A	B	C	D	180.	A	B	C	D
181.	A	B	C	D	182.	A	B	C	D	183.	A	B	C	D
184.	A	B	C	D	185.	A	B	C	D	186.	A	B	C	D
187.	A	B	C	D	188.	A	B	C	D	189.	A	B	C	D
190.	A	B	C	D	191.	A	B	C	D	192.	A	B	C	D
193.	A	B	C	D	194.	A	B	C	D	195.	A	B	C	D
196.	A	B	C	D	197.	A	B	C	D	198.	A	B	C	D

Vom Teilnehmer auszufüllen	
Name:	**Prüf.-Nr.:**
Prüfungsdatum:	**Unterschrift**

199.	**A**	**B**	**C**	**D**		**200.**	**A**	**B**	**C**	**D**

Nur für den internen Gebrauch	
LÖSUNGSBOGEN	**Prüf.-Nr.:**
Prüfungsdatum:	

1.			C		**2.**		B			**3.**				D
4.		**B**			**5.**	**A**				**6.**		**B**		
7.		**B**			**8.**			**C**		**9.**		**B**		
10.				**D**	**11.**		**B**			**12.**	**A**			
13.		**B**			**14.**				**D**	**15.**	**A**			
16.			**C**		**17.**		**B**			**18.**	**A**			
19.			**C**		**20.**		**B**			**21.**			**C**	
22.	**A**				**23.**	**A**				**24.**		**B**		
25.	**A**				**26.**				**D**	**27.**			**C**	
28.	**A**				**29.**				**D**	**30.**	**A**			
31.		**B**			**32.**	**A**				**33.**	**A**			
34.			**C**		**35.**	**A**				**36.**			**C**	
37.		**B**			**38.**				**D**	**39.**			**C**	
40.			**C**		**41.**	**A**				**42.**	**A**			
43.			**C**		**44.**				**D**	**45.**			**C**	
46.		**B**			**47.**				**D**	**48.**		**B**		
49.		**B**			**50.**			**C**		**51.**		**B**		
52.	**A**				**53.**		**B**			**54.**				**D**
55.		**B**			**56.**				**D**	**57.**			**C**	
58.				**D**	**59.**		**B**			**60.**	**A**			
61.	**A**				**62.**	**A**				**63.**		**B**		
64.			**C**		**65.**				**D**	**66.**			**C**	

Nur für den internen Gebrauch	
LÖSUNGSBOGEN	**Prüf.-Nr.:**
Prüfungsdatum:	

67.		**B**			**68.**	**A**				**69.**			**C**	
70.			**C**		**71.**			**C**		**72.**		**B**		
73.			**C**		**74.**		**B**			**75.**				**D**
76.	**A**				**77.**	**A**				**78.**	**A**			
79.			**C**		**80.**	**A**				**81.**	**A**			
82.				**D**	**83.**	**A**				**84.**				**D**
85.	**A**				**86.**			**C**		**87.**				**D**
88.		**B**			**89.**	**A**				**90.**				**D**
91.			**C**		**92.**				**D**	**93.**		**B**		
94.		**B**			**95.**				**D**	**96.**	**A**			
97.				**D**	**98.**		**B**			**99.**				**D**
100.	**A**				**101.**			**C**		**102.**			**C**	
103.			**C**		**104.**			**C**		**105.**			**C**	
106.	**A**				**107.**	**A**				**108.**		**B**		
109.		**B**			**110.**		**B**			**111.**		**B**		
112.			**C**		**113.**			**C**		**114.**	**A**			
115.				**D**	**116.**				**D**	**117.**	**A**			
118.		**B**			**119.**			**C**		**120.**	**A**			
121.			**C**		**122.**				**D**	**123.**				**D**
124.				**D**	**125.**			**C**		**126.**		**B**		
127.			**C**		**128.**			**C**		**129.**				**D**
130.				**D**	**131.**				**D**	**132.**				**D**

Nur für den internen Gebrauch	
LÖSUNGSBOGEN	**Prüf.-Nr.:**
Prüfungsdatum:	

133.		**B**			**134.**		**B**			**135.**				**D**
136.		**B**			**137.**			**C**		**138.**				**D**
139.			**C**		**140.**			**C**		**141.**				**D**
142.	**A**				**143.**	**A**				**144.**	**A**			
145.				**D**	**146.**			**C**		**147.**	**A**			
148.		**B**			**149.**		**B**			**150.**				**D**
151.	**A**				**152.**	**A**				**153.**				**D**
154.		**B**			**155.**		**B**			**156.**		**B**		
157.			**C**		**158.**	**A**				**159.**		**B**		
160.				**D**	**161.**	**A**				**162.**	**A**			
163.				**D**	**164.**				**D**	**165.**	**A**			
166.	**A**				**167.**			**C**		**168.**				**D**
169.	**A**				**170.**		**B**			**171.**			**C**	
172.			**C**		**173.**			**C**		**174.**		**B**		
175.	**A**				**176.**		**B**			**177.**		**B**		
178.				**D**	**179.**			**C**		**180.**	**A**			
181.				**D**	**182.**			**C**		**183.**				**D**
184.			**C**		**185.**				**D**	**186.**				**D**
187.	**A**				**188.**				**D**	**189.**			**C**	
190.		**B**			**191.**	**A**				**192.**	**A**			
193.			**C**		**194.**			**C**		**195.**				**D**
196.				**D**	**197.**		**B**			**198.**			**C**	

Nur für den internen Gebrauch	
LÖSUNGSBOGEN	**Prüf.-Nr.:**
Prüfungsdatum:	

199.		**B**			**200.**	**A**				