GUÍA DE ESTUDIOS - TITULACIÓN PILOTO NAVAL					
Q. Number	**Question**	**A**	**B**	**C**	**D**
Plan and conduct a passage - Celestial Navigation					
1	The magnitude of a star is a measure of its...	absolute brightness.	relative brightness.	diameter.	semi-diameter.
2	The true zenith distance of the Sun when on the observer's meridian bearing North is 46° 23.9' and the declination is 9° 15'.0 S. Calculate the observer's latitude.	37° 08.9' N	37° 08.9' S	55° 38.9' S	64° 23.2' S
3	The true zenith distance of the Sun when on the observer's meridian bearing South is 54° and the declination is 4° S. Calculate the observer's latitude.	50° N	58° N	50° S	58° S
4	Given that the True Zenith Distance is 36° 22.0' and that the Calculated Zenith Distance is 36° 24.8', find and name the intercept, with respect to the direction of the observed body.	2.8' Away	4.0' Away	2.8' Towards	4.0' Towards
5	Which one of the following errors of the sextant would you be unable to adjust or minimise?	Perpendicularity.	Centering.	Side.	Index.
6	The earth is said to be in "aphelion" on approximately...	1st January.	21st January.	21st June.	4th July.
7	From those listed, how can the index error be detected in a marine sextant?	Clamp the index somewhere on the arc; hold the sextant horizontally with the arc away and look at the arc and its reflection in the index glass.	Clamp the index at zero; hold the sextant horizontally and observe true and reflected horizon through the telescope.	Clamp the index at zero; hold the sextant vertically and observe true and reflected image of a star through the telescope.	Clamp the index somewhere on the arc; hold the sextant vertically and observe the sun (using shades) through the telescope.
8	The true zenith distance of the Sun when on the observer's meridian bearing North is 6° 57.4' and the declination is 21° 28'.4 S. Calculate the observer's latitude.	28° 25.8' N	14° 31.0' N	28° 25.8' S	14° 31.0' S
9	A first observation of the Sun was taken at 0815 Local Time. If the vessel is steaming at 14 knots, how far should the position line be moved along the couse made good to find the position at 1200?	48.3 miles	49 miles	52.5 miles	56 miles

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Plan and conduct a passage - Celestial Navigation					
10	Stars tabulated in the nautical almanac which have a negative magnitude (e.g.-1.4)...	should only be used for navigation in exceptional circumstances.	are only visible in the southern hemisphere.	are very bright.	are only visible with the aid of the sextant telescope.
11	The earth rotates around the sun approximately every...	360 days.	365 days.	366 days.	367 days.
12	A position line drawn in the direction 045°/225° could correspond to an azimuth of the observed body of...	155° True	045° True	315° True	325° True
13	The true zenith distance of the Sun when on the observer's meridian bearing South is 6° 57.4' and the declination is 14° 36'.2 S. Calculate the observer's latitude.	21° 33.6' N	07° 38.8' S	07° 38.8' N	21° 33.6' S
14	The times of civil twilight are tabulated in the Nautical Almanac. These times are...	the LMT when the sun's centre reaches 12° below the visible horizon before sunrise and after sunset.	the LMT when the sun's centre reaches 6° below the visible horizon before sunrise and after sunset.	the LAT when the sun's centre reaches 12° below the visible horizon before sunrise and after sunset.	the LAT when the sun's centre reaches 6° below the visible horizon before sunrise and after sunset.
15	Sidereal hour angle is defined as the angular distance of an hour circle...	west of the First Point of Aries.	west of the observer's meridian.	west of the prime (Greenwich) meridian.	east of a reference hour circle.
16	Which one of the following errors of the sextant would you attempt to remove?	Centering error.	Shade error.	Prismatic error.	Perpendicularity.
17	A position line drawn in the direction 070°/250° could correspond to an azimuth of the observed body of...	050° True	070° True	250° True	160° True
18	If a ship is in 150°E longitude and the equation of time is +6 minutes, what is the GMT of noon at the ship?	O154	O206	2154	2206
19	The summer solstice in the northern hemisphere is approximately on...	1st June.	21st June.	1st July.	21st July.
20	Given that the true altitude is 57° 24.9' calculate the True Zenith Distance	46° 20.2'	57° 24.9'	32° 35.1'	55° 53.6'

GUÍA DE ESTUDIOS - TITULACIÓN PILOTO NAVAL					
Q. Number	**Question**	**A**	**B**	**C**	**D**
Plan and conduct a passage - Celestial Navigation					
21	The index error of a marine sextant read as 35° 25'.3 is known to be 2' off the arc. Find the observed altitude.	35° 25.3'	35° 27.3'	35° 23.3'	35° 29.3'
22	If a star has a northerly declination and the observer is in north latitude, which of the statements listed is true?	The star will be above the horizon for more than 12 hours.	The star must be circumpolar.	The star will be above the horizon for less than 12 hours.	The bearing of the star must be south when on the meridian.
23	A first observation of the Sun was taken at 0815 Local Time. If the vessel is steaming at 12 knots, how far should the position line be moved along the couse made good to find the position at 1200.	45 miles	36 miles	48 miles	42 miles
24	If a ship is in 90°E longitude and the equation of time is -4 minutes, what is the GMT of noon at the ship?	0556	0604	1756	1804
25	Given that the True Zenith Distance is 64° 44.0' and that the Calculated Zenith Distance is 64° 53.0', find and name the intercept, with respect to the direction of the observed body.	9.0' Away	11.0' Away	2.8' Towards	9.0' Towards
26	Which error exists when the axis of the telescope of a sextant is not parallel to the plane of the instrument?	Collimation.	Side.	Prismatic.	Parallelism.
27	The times of sunrise and sunset are tabulated in the Nautical Almanac. These times are...	the LMT when the upper limb is on the visible horizon for an observer at sea level.	the LAT when the upper limb is on the visible horizon for an observer at sea level.	the LMT when the lower limb is on the visible horizon for an observer at sea level.	the LAT when the lower limb is on the visible horizon for an observer at sea level.
28	Given that the True Zenith Distance is 17° 44.0' and that the Calculated Zenith Distance is 17° 46.0', find and name the intercept, with respect to the direction of the observed body.	2.0' Away	4.0' Away	2.0' Towards	4.0' Towards
29	Which of the statements listed about the first point of Aries is true?	It is a fixed point in space.	It moves slowly westwards.	It moves slowly eastwards.	It rotates on the celestial sphere once each year.

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Q. Number	**Question**	**A**	**B**	**C**	**D**
Plan and conduct a passage - Celestial Navigation					
30	The declination of a celestial body is the...	angle, measured at the centre of the earth, between the observer and the body.	angle, measured at the centre of the earth, between the body and the ecliptic.	arc of the celestial meridian between the equinoctial and the parallel of declination passing through the body.	arc of the celestial meridian between the ecliptic and the parallel of declination passing through the body.
31	Given that the True Zenith Distance is 36° 24.8' and that the Calculated Zenith Distance is 36° 22.0', find and name the intercept, with respect to the direction of the observed body.	2.8' Away	4.0' Away	2.8' Towards	4.0' Towards
32	The true zenith distance of the Sun when on the observer's meridian bearing South is 15° 23.6' and the declination is 22° 19.5' N. Calculate the observer's latitude.	6° 55.9' N	6° 55.9' S	17° 43.1' N	37° 43.1' N
33	A position line drawn in the direction 150°/330° could correspond to an azimuth of the observed body of...	240° True	230° True	250° True	150° True
34	At the winter solstice, the sun will not rise at all in higher latitudes than...	23.5°	66.5°	72.5°	90°
35	For a circumpolar star, which, from those listed, is NOT true?	The declination and latitude of the observer must be the same name (both north or both south).	The LHA of the star will always be less than 90°.	The polar distance of the star must be less than the observer's latitude.	The star is above the horizon for 24 hours of the day.
36	What do you call the error in the observed altitude of the sun, which results from the observer being on the surface of the earth not at its centre?	Dip.	Semi-diameter.	Parallax.	Refraction.
37	The true zenith distance of the Sun when on the observer's meridian bearing South is 15° and the declination is 22° N. Calculate the observer's latitude.	7° N	37° S	7° S	37° N

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Q. Number	**Question**	**A**	**B**	**C**	**D**
Plan and conduct a passage - Celestial Navigation					
38	A first observation of the Sun was taken at 0915 Local Time. If the vessel is steaming at 16 knots, how far should the position line be moved along the couse made good to find the position at 1200?	48 miles	44 miles	50 miles	51 miles
39	At the summer solstice, the altitude of the sun at noon to an observer at the pole would be...	0°	23.5°	66.5°	90°
40	If a ship is in 30°W longitude and the equation of time is -4 minutes, what is the GMT of noon at the ship?	0956	1004	1356	1404
41	Which of the statements listed is true in relation to the magnitude of stars?	A 1st magnitude star is 100 times brighter than a 6th magnitude star.	A 6th magnitude star is 100 times brighter than a 1st magnitude star.	A 1st magnitude star is 6 times brighter than a 6th magnitude star.	A 6th magnitude star is 6 times brighter than a 1st magnitude star.
42	The sun is at the first point of Aries on the celestial sphere at approximately...	21st March.	21st June.	21st September.	21st December.
43	The plane of the index mirror of the sextant is at an angle of 20° to the plane of the horizon mirror. What is the reading on the arc?	60°	80°	20°	40°
44	Given that the true altitude is 46° 20.2' calculate the True Zenith Distance.	43° 39.8'	72° 16.0'	34° 06.4'	46° 20.2'
45	The true altitude of Canopus is 64° 52'.4. Find the true zenith distance.	15° 07.6'	25° 07.6'	25° 06.7'	15° 06.7'
46	To an observer in longitude 65°W, the LHA of a star is 48°. If the SHA of the star is 217°, what is the GHA of Aries?	104°	160°	256°	304°
47	The true zenith distance of the Sun when on the observer's meridian bearing North is 6° and the declination is 16° N. Calculate the observer's latitude.	10° N	10° S	22° N	22° S
48	A position line drawn in the direction 085°/265° could correspond to an azimuth of the observed body of...	355° True	085° True	005° True	265° True

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Q. Number	**Question**	**A**	**B**	**C**	**D**
Plan and conduct a passage - Celestial Navigation					
49	If the Azimuth of a body is found to be 305° True, the position line would be drawn through the Intercept Terminal Position in a direction of...	085°/265°	095°/275°	035°/215°	075°/255°
50	The true altitude of Arcturus is 42° 28'.4. Find the true zenith distance.	47° 31.6'	57° 31.6'	47° 36.1'	46° 31.6'
51	To an observer at the south pole, at the beginning of September...	the sun will be above the horizon throughout the day.	there will be a period of twilight for a few hours only around noon.	there will be twilight throughout the day.	the sun will rise for a short period around noon.
52	The true zenith distance of the Sun when on the observer's meridian bearing North is 39° 14.3' and the declination is 17° 22'.1 N. Calculate the observer's latitude.	21° 52.2' S	24° 52.2' S	56° 36.4' N	56° 36.4' S
53	The moon spins on its axis approximately every...	1 day.	7 days.	28 days.	1 year.
54	The path of the earth's rotation around the sun, relative to the plane of the equator, is...	parallel.	at right angles.	at an angle of 5°.	at an angle of 23.5°.
55	What is the "error of perpendicularity" on a marine sextant?	When the index mirror and the horizon glass/mirror are not parallel at all times.	When the telescope collar is not perpendicular to the plane of the sextant.	When the index mirror is not perpendicular to the plane of the sextant.	When the horizon glass/mirror is not perpendicular to the plane of the sextant.
56	After all the adjustments have been made to the sextant, any remaining error is called...	index error.	personal error.	instrument error.	summation error.
57	Latitude on the terrestrial sphere is comparable with what on the celestial sphere?	Declination.	Celestial meridian.	Altitude.	Celestial hour circle.
58	If the Azimuth of a body is found to be 222° True, the position line would be drawn through the Intercept Terminal Position in a direction of...	122°/322°	132°/312°	112°/292°	042°/222°

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Q. Number	**Question**	**A**	**B**	**C**	**D**
Plan and conduct a passage - Celestial Navigation					
59	To an observer in longitude 164°E, the LHA of the sun is 26°. What is the GHA of the sun?	138°	170°	190°	222°
60	When the index mirror and the horizon mirror of the sextant are parallel, the sextant should read...	90°	60°	0°	120°
61	The path of the moon's rotation around the earth, relative to the plane of the earth's rotation around the sun, is...	parallel.	at right angles.	at an angle of 5°.	at an angle of 23.5°.
62	The true altitude of the suns lower limb is 74° 45'.4. Find the true zenith distance.	14° 14.6'	16° 14.6'	25° 14.6'	15° 14.6'
63	The correction for atmospheric refraction as applied to the observed altitude of a body...	increases with altitude.	depends only on atmospheric conditions, and is independent of altitude.	decreases with altitude.	is negligible and can be ignored.
64	What is "side error" on a marine sextant?	When the index mirror and the horizon glass/mirror are not parallel at all times.	When the telescope collar is not perpendicular to the plane of the sextant.	When the index mirror is not perpendicular to the plane of the sextant.	When the horizon glass/mirror is not perpendicular to the plane of the sextant.
65	The index error of a marine sextant read as 48° 25'.3 is known to be 5' on the arc. Find the observed altitude.	48° 20.3'	48° 30.3'	48° 25 .3'	48° 35.3'
66	If the GHA of the sun is 173° and the LHA is 358°, what is the longitude?	5°E	5°W	175°E	175°W
67	To an observer in longitude 75°W, the LHA of the sun is 327°. What is the GHA of the sun?	042°	108°	252°	318°
68	To an observer in longitude 172°E, the LHA of a star is 315°. If the SHA of the star is 036°, what is the GHA of Aries?	091°	107°	127°	143°

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Q. Number	**Question**	**A**	**B**	**C**	**D**
Plan and conduct a passage - Celestial Navigation					
69	The true zenith distance of the Sun when on the observer's meridian bearing North is 6° 57.4' and the declination is 16° 25'.4 N. Calculate the observer's latitude.	09° 28.0' N	09° 28.0' S	23° 22.8' N	23° 22.8' S
70	The magnitude of a star which can only just be seen with the naked eye on a clear, dark night is...	1st magnitude.	3rd magnitude.	4th magnitude.	6th magnitude.
71	The true zenith distance of the Sun when on the observer's meridian bearing South is 31° 30' and the declination is 16° 25'.4 N. Calculate the observer's latitude.	15° 04.6' N	16° 25.4' N	15° 04.6' S	47° 55.4' N
72	If the Azimuth of a body is found to be 069° True, the position line would be drawn through the Intercept Terminal Position in a direction of...	149°/329°	169°/349°	069°/249°	159°/339°
73	The sidereal hour angle of a celestial body is the...	arc of the equinoctial (measured westwards from the first point of Aries) to the celestial meridian through the body.	arc of the equinoctial (measured eastwards from the first point of Aries) to the celestial meridian through the body.	angle at the celestial pole between the meridian through Greenwich and the meridian through the body (measured westwards).	angle at the celestial pole between the meridian through Greenwich and the meridian through the body (measured eastwards).
74	What is the angle between the ecliptic and the equinoctial?	0°	23.5°	66.5°	90°
75	From those listed, how can the error of perpendicularity be detected in a marine sextant?	Clamp the index somewhere on the arc; hold the sextant horizontally with the arc away and look at the arc and its reflection in the index glass.	Clamp the index at zero; hold the sextant horizontally and observe true and reflected horizon through the telescope.	Clamp the index at zero; hold the sextant vertically and observe true and reflected image of the horizon through the telescope.	Clamp the index somewhere on the arc; hold the sextant vertically and observe the sun (using shades) through the telescope.
76	If the GHA of the sun is 315° and the LHA is 36°, what is the longitude?	9°E	59°W	81°E	121°W

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Q. Number	**Question**	**A**	**B**	**C**	**D**
Plan and conduct a passage - Celestial Navigation					
77	The value of the "equation of time" is...	between zero and about 17 minutes.	between zero and about 30 minutes.	dependent upon the observer's longitude.	dependent upon the observer's latitude.
78	The summer solstice in the southern hemisphere is approximately on...	1st January.	21st January.	1st December.	21st December.
79	A position line drawn in the direction 095°/275° could correspond to an azimuth of the observed body of...	355° True	005° True	095° True	275° True
80	The earth spins on its axis approximately every...	23 hours.	23.5 hours.	24 hours.	24.5 hours.
81	The first point of Aries is the point on the celestial sphere where...	the sun crosses the ecliptic when going from south to north.	the sun crosses the equinoctial when going from north to south.	the ecliptic cuts the equinoctial on the sun's apparent path from south to north.	the prime meridian cuts the equinoctial.
82	What would you adjust in an attempt to eliminate index error of a sextant?	The telescope.	The horizon glass.	The tangent screw.	Nothing; the sextant should be sent ashore for re-calibration.
83	The true zenith distance of the Sun when on the observer's meridian bearing South is 54° 28'.6 and the declination is 4° 28'.4 S. Calculate the observer's latitude.	50° 00.2' N	58° 57.0' N	50° 00.0' N	58° 28.6' N
84	The earth is said to be in "perihelion" on approximately...	1st January.	21st January.	21st June.	4th July.
85	The "equation of time" is...	the formula for calculating the time of noon.	the formula for determining local time from Greenwich time.	the interval between apparent time and mean time.	the difference between a lunar day and a solar day.
86	Given that the true altitude is 61° 47.9' calculate the True Zenith Distance	46° 20.2'	28° 12.1'	43° 39.8'	32° 35.1'
87	Given that the true altitude is 17° 44.0' calculate the True Zenith Distance.	32° 35.1'	43° 39.8'	34° 06.4'	72° 16.0'

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Plan and conduct a passage - Celestial Navigation					
88	What is the "error of collimation" on a marine sextant?	When the telescope and/or mirrors causes distortion.	When the telescope is not parallel to the plane of the sextant.	When the arc has been incorrectly graduated or has been damaged.	When the vernier or micrometer scals are incorrect.
89	The moon rotates around the earth approximately every...	1 day.	7 days.	28 days.	1 year.
90	If the Azimuth of a body is found to be 355° True, the position line would be drawn through the Intercept Terminal Position in a direction of...	085°/265°	095°/275°	355°/175°	075°/255°
91	At sunrise and sunset, the effect of atmospheric refraction is to...	reduce the sun's apparent horizontal diameter.	make the sun appear to change altitude more slowly.	make the sun appear smaller overall.	reduce the sun's apparent vertical diameter.
92	The true zenith distance of the Sun when on the observer's meridian bearing North is 6° and the declination is 21° S. Calculate the observer's latitude.	27° N	15° N	27° S	15° S

GUÍA DE ESTUDIOS PILOTO NAVAL	
Plan and conduct a passage - Celestial Navigation	
ANSWERS	
1	B
2	C
3	A
4	C
5	B
6	D
7	C
8	C
9	C
10	C
11	B
12	C
13	B
14	B
15	A
16	D
17	D
18	B
19	B
20	C
21	B
22	A
23	A
24	A
25	D
26	A
27	A
28	C
29	B
30	C
31	A

GUÍA DE ESTUDIOS PILOTO NAVAL	
Plan and conduct a passage - Celestial Navigation	
ANSWERS	
32	D
33	A
34	B
35	B
36	C
37	D
38	B
39	B
40	C
41	A
42	A
43	D
44	A
45	B
46	C
47	A
48	A
49	C
50	A
51	C
52	A
53	C
54	D
55	C
56	A
57	A
58	B
59	D
60	C
61	C
62	D

GUÍA DE ESTUDIOS PILOTO NAVAL	
Plan and conduct a passage - Celestial Navigation	
ANSWERS	
63	C
64	D
65	A
66	D
67	A
68	B
69	A
70	D
71	D
72	D
73	A
74	B
75	A
76	C
77	A
78	D
79	B
80	C
81	C
82	B
83	A
84	A
85	C
86	B
87	D
88	B
89	C
90	A
91	D
92	C

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ANSWERS