GUÍA DE ESTUDIOS - TITULACIÓN PILOTO NAVAL					
Q. Number	**Question**	**A**	**B**	**C**	**D**
Plan and conduct a passage - Compasses: Magnetic and Gyro and Steering Control Systems.					
1	How often should the magnetic compass error be checked ?	Once a day.	Once a watch and after a major course alteration.	Twice a day.	After each major alteration of course.
2	The "magnetic variation" is the angle between...	the geographic meridian and compass north.	the geographic and magnetic meridians.	the magnetic meridian and compass north.	the vessel's head by gyro and the vessel's head by standard compass.
3	Magnetic variation changes its value with...	the vessel's trim or heel.	the location of the compass within the vessel.	the change in direction of the vessel's heading.	the vessel's position on the earth.
4	When soft iron is induced by the earth's magnetism.....	there are no poles to consider as the magnetism dies when the induction ceases.	there is said to be a red pole at the end directed towards the north.	there is said to be a blue pole at the end directed towards the north.	the poles are said to be distributed throughout the iron.
5	If a ship has permanent magnetism with a blue pole to port, the deviation caused will be...	zero on north and south, west on easterly, east on westerly courses.	zero on north and south, east on easterly, west on westerly courses.	zero on east and west, west on northerly, east on southerly courses.	zero on east and west, east on northerly, west on southerly courses.
6	The deviation of a compass produced by a disturbing magnet varies...	inversely with the distance from the magnet.	inversely with the square of the distance from the magnet.	directly with the distance from the magnet.	inversely with the cube of the distance from the magnet.
7	Latitude error means that, in the northern hemisphere, the north end of a gyro compass (damped in tilt) settles...	to the east of the meridian and above the horizontal.	to the west of the meridian and above the horizontal.	to the east of the meridian and below the horizontal.	to the west of the meridian and below the horizontal.
8	Damping in tilt in a gyro compass produces...	a settling position exactly on the meridian.	an error which varies with latitude.	an error which is constant.	an error which varies with longitude.
9	Heeling error is at its maximum when the courses are...	north or south.	east or west.	NE, SE, SW or NW.	any course - the effects are independent of the course.

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10	Who is authorised to carry out repairs to a ship's magnetic compass?	Only a certified compass adjuster.	The Master only.	Any officer with a Master's certificate of competency.	Any officer with a deck certificate of competency.
11	The principle of a fibre-optic "gyro" compass relies on...	a fibre-optic aerial, which detects signals from a satellite and computes the direction of north.	three fibre-optic rings, mounted on a platform, which sense the rotations of the platform due to ship and earth movement.	two fibre-optic sensors, which measure the accelerations of the ship and compares these to the movement of the earth.	a spinning fibre-optic wheel, which operates like a conventional gyro, but is much lighter.
12	A gyro compass on a high-speed craft often takes time to settle correctly when altering course. What causes this problem?	The change in the (large) value of the latitude course and speed error when altering course.	The accelerations of high speed craft, producing additional errors.	The vibrations caused by light displacement ships at high speed.	The unsteadiness of high-speed craft, due to heel when altering course at high speed.
13	Latitude , course and speed error of a gyro compass...	applies only to gyros which are damped in tilt.	applies only to gyros which are damped in azimuth.	does not occur in a properly set up gyro compass.	applies to all gyro compasses.
14	From those listed, which of the statements about magnetic variation is true?	The value of variation at a particular place is always the same.	The value of variation varies according to the magnetic influences of the ship.	The value of variation at a place changes slowly.	The value of variation is due to the combined influences of the ship and the earth.
15	How many degrees are there in each point of the compass?	15	11.25	17.5	12
16	In what direction (approximately) does the axis of the gyro compass wheel point?	True North	Magnetic North	East/West	North Relative
17	Free gyroscopes are turned into gyro compasses by utilising...	gravity.	the spin of the earth.	the torque of the wheel.	the rate of spin of the wheel.

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18	Compass error is...	the angle between the heading by gyro and the heading by standard compass.	the angle between magnetic and true north.	the angle between magnetic compass and true north.	the angle between magnetic and compass north.
19	What is meant by "retentive magnetism" with regard to a ship's magnetic compass?	The compass needle retains induced magnetism if the ship has been heading in the same direction for a considerable period.	The ship retains induced magnetism if the ship has been heading in the same direction for a considerable period.	The compass retains a "magnetic memory" of the previous course when the ship changes to a new one.	The correctors retain magnetism from magnetic objects placed near to the compass.
20	What is the main advantage of a liquid compass over a dry card compass?	It is steadier than a dry card compass.	It is more easily adjusted than a dry card compass.	It has a slower period of oscillation than a dry card compass.	It is more accurate than a dry card compass.
21	From those listed, which of the statements about magnetic variation is NOT true?	Variation is the angle between the true and magnetic meridians at any place.	Variation can be any value between 180°E and 180°W.	Variation is at its maximum value at the magnetic equator.	Variation is due to the true and magnetic poles not being in the same place.
22	Curves on charts showing values of equal variation are called...	isogonic.	isobaric.	isothermal.	isopharic.
23	If the axis of a free gyroscope on the equator is horizontal, the northerly end of the spin axis will...	drift west and tilt up.	tilt up if to the east of the meridian.	tilt up if to the west of the meridian.	drift east and tilt up.
24	When a force is applied at right angles to the spin axis of a free gyroscope, the axis moves...	at 90° to the torque in the opposite direction to the spin.	at 180° to the torque in the opposite direction to the spin.	at 90° to the torque in the direction of the spin.	at 90° to the torque in the direction of the spin.

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25	If a ship is built in a yard while heading south, the poles of permanent magnetism will be...	if built in the northern hemisphere, red to the bow, but built in the southern hemisphere blue to the bow.	red to the bow and blue to the stern.	blue to the bow and red to the stern.	if built in the northern hemisphere, blue to the bow, but built in the southern hemisphere red to the bow.
26	A ship which has discharged cargo using electromagnets does not necessarily have to have the magnetic compass readjusted. Why not?	Because any induced magnetism will probably decay fairly quickly.	Because, unless the cargo hold is within 3 metres of the compass, no effect will be felt.	Because electromagnetic cargo gear is especially designed not to affect ships' compasses.	Because the correctors compensate for any such effects.
27	If a ship has permanent magnetism with a blue pole forward, the deviation caused will be...	zero on north and south, west on easterly, east on westerly courses.	zero on north and south, east on easterly, west on westerly courses.	zero on east and west, west on northerly, east on southerly courses.	zero on east and west, east on northerly, west on southerly courses.
28	If a ship is built in a yard while heading east, the poles of permanent magnetism will be...	if built in the northern hemisphere, red to port, if built in the southern hemisphere blue to port.	red to port and blue to starboard.	blue to port and red to starboard.	if built in the northern hemisphere, blue to port, if built in the southern hemisphere red to port.
29	How many points of the compass are there?	40	24	32	36
30	The effect of gravity control makes the axis of the gyroscope...	move clockwise around a central position in an ellipse.	move anticlockwise around a central position in an ellipse.	move anticlockwise around a central position in a circle.	move clockwise around a central position in an ellipse.

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31	From those listed, which is NOT a way of destroying magnetism?	Heating the magnet.	Placing another magnet next to it with unlike poles together.	Subjecting the magnet to violent shocks.	Applying alternating current to the magnet.
32	Who is legally responsible for the maintenance of the ship's magnetic compass?	An officer especially trained for that role.	Each officer of the watch shares that responsibility.	The owner and Master jointly.	The compass adjuster nominated by the company.
33	A magnetic compass is subject, if certain objects are placed nearby, to interference which may affect the heading shown. From those listed, which is NOT likely to do so?	Coins (money).	A mobile phone.	A lap-top computer.	A portable radio receiver.
34	If a ship is built in a yard while heading north, the poles of permanent magnetism will be...	if built in the northern hemisphere, red to the bow, if built in the southern hemisphere blue to the bow.	red to the bow and blue to the stern.	blue to the bow and red to the stern.	if built in the northern hemisphere, blue to the bow, if built in the southern hemisphere red to the bow.
35	The gyro course is 332° and the gyro error is 2° High. What is the true course?	330°	332°	334°	It could be any of the other options.
36	How is a ship's permanent magnetism acquired during building?	By the sum of all the magnetic forces of the individual components.	By the insertion of permanent magnets into the structure, to offset the inducing forces.	By the hammering and heating processes while heading in the same direction in the building yard.	By the designers who ensure that the magnetic effects are within limits imposed under the class of the ship.
37	Variation values change for a particular place because...	the magnetic poles are not in the same positions as the geographic poles.	the angle between the magnetic meridian and the meridian at the place varies according to the heading of the ship.	ionospheric changes cause the magnetic poles to move in a random fashion.	the magnetic poles are moving their positions in relation to the geographic poles.

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Q. Number	**Question**	**A**	**B**	**C**	**D**
Plan and conduct a passage - Compasses: Magnetic and Gyro and Steering Control Systems.					
38	The ship's magnetic compass should be adjusted following certain circumstances. From those listed, which is NOT one of those circumstances?	When it appears unreliable.	When major structural repairs have been carried out.	When electrical equipment is installed in the vicinity of the compass.	When a new Master joins the ship.
39	From those listed, which is NOT a reason for having the standard magnetic compass high up and on the centreline in the ship?	In order to reduce the chance of damage.	To enable an all-round view of the horizon for taking bearings.	To keep it away from most other sources of magnetism.	So that induced magnetism is balanced as evenly as possible.
40	The proces of turning a gravity controlled gyroscope into a compass is called...	precession.	torque.	tilting.	damping.
41	With reference to magnetism, soft iron...	means that it can change its polarity without change of position.	is iron which retains its magnetism when the inducing field is removed.	cannot be magnetised.	can only be magnetised by a strong inducing field.
42	The vertical force of the earth's magnetism....	causes deviation of the magnetic compass.	influences the values of variation.	does not cause deviation of the magnetic compass.	can be used to calculate the value of variation.
43	Precession in relation to a free gyroscope is...	the change of direction of the spin axis when a force is applied in the direction of the axis.	the rate of change of direction of the spin axis due to the rotation of the earth.	the rate of change of direction and tilt of the spin axis due to the rotation of the earth.	the change of direction of the spin axis when a force is applied at right angles to the axis.
44	From those listed, which of the statements about the dip of a magnet is true?	At the magnetic equator, the dip is zero and the directive force greatest.	At the magnetic equator, the dip is maximum and the directive force the least.	At the magnetic poles, the dip is least and the directive force is the greatest.	At the magnetic poles, the dip is least and the directive force is reduced.
45	Gaussin Error of the magnetic compass is caused by...	the ship swinging quickly from one course to another.	the ship being on the same heading for a long period.	external magnetic influences, such as from magnetic mines.	internal magnetic influences, such as electrical equipment near the compass.

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Q. Number	**Question**	**A**	**B**	**C**	**D**
Plan and conduct a passage - Compasses: Magnetic and Gyro and Steering Control Systems.					
46	If a ship has permanent magnetism with a red pole forward, the deviation caused will be...	zero on north and south, west on easterly, east on westerly courses.	zero on north and south, east on easterly, west on westerly courses.	zero on east and west, west on northerly, east on southerly courses.	zero on east and west, east on northerly, west on southerly courses.
47	Gaussin or Retentive error...	can be calculated and allowed for when setting courses.	can only be approximately calculated by undertaking a swing of the compass.	is uncertain in size, but only affects the compass for a very short period.	is uncertain in size and may take several hours to clear.
48	If the axis of a free gyroscope in a north latitude is horizontal and pointed to the east of north of the meridian, it will...	drift east and tilt up.	drift west and tilt up.	drift east and tilt down.	drift west and tilt down.
49	Damping in azimuth in a gyro compass produces...	a settling position exactly on the meridian.	an error which varies with latitude.	an error which is constant.	an error which varies with longitude.
50	The magnetic equator is...	coincident with the earth's equator.	parallel to the earth's equator, but moves north and south with the seasons.	the line joining places where the dip is zero.	the line joining places where the directive force is least.
51	Magnetic compass deviation changes with....	speed.	draught.	heading.	longitude.
52	A free gyroscope is said to have "three degres of freedom". From those listed, which is NOT one of these?	Latitude axis.	Spin axis.	Altitude axis.	Azimuth axis.
53	The magnetic force exerted at any point in the magnetic field varies...	inversely with the distance from the magnet.	inversely with the square of the distance from the magnet.	directly with the distance from the magnet.	inversely with the cube of the distance from the magnet.
54	All gyro compasses, when on the equator, should have...	an easterly error.	a westerly error.	no latitude error.	an error depending upon the course.
55	From those listed, which are "soft iron" correctors?	The heeling error correctors.	The fore and aft correctors.	The athwartship correctors.	The spheres.

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56	The effect of Gaussin or Retentive error when a ship alters course is to produce a..	westerly error if she swings to starboard and vice versa.	easterly error if she swings to starboard and vice versa.	westerly error in the northern hemisphere and vice versa.	easterly error in the northern hemisphere and vice versa.
57	The ship's magnetic compass should be especially checked for error following certain circumstances. From those listed, which is NOT one of those circumstances?	After carrying cargoes with magnetic properties.	After using electromagnetic lifting appliances to load or discharge.	If the ship has visited an area with a large value of variation.	If the ship has been laid up for a period.
58	With reference to magnetism, hard iron...	means that it can change its polarity without change of position.	is iron which retains its magnetism when the inducing field is removed.	cannot be magnetised.	can only be magnetised by a permanent field.
59	Where do you find a note of the annual rate of change in the magnetic variation at a place?	In the Nautical Ephemeris.	In the compass rose of the charts for the area.	In the latest Notices to Mariners.	In Local Notices to Mariners.
60	If a ship has permanent magnetism with a red pole to port, the deviation caused will be...	zero on north and south, west on easterly, east on westerly courses.	zero on north and south, east on easterly, west on westerly courses.	zero on east and west, west on northerly, east on southerly courses.	zero on east and west, east on northerly, west on southerly courses.
61	The gyro course is 165° and the gyro error is 3° Low. What is the true course?	162°	165°	168°	It could be any of the other options.
62	Gyroscopic inertia means that the spin axis of a free gyroscope...	always points to true north.	always points to the Pole Star.	points to the same place on earth, unless a force is applied.	points in the same direction in space, unless a force is applied.
63	Leading lights are in line bearing 126°T. If the gyro error is 2° Low, what would the gyro bearing of the leading lights be?	124°	126°	128°	It depends upon the heading of the ship.

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64	Fibre-optic compasses have advantages over conventional gyro compasses. From those listed, which is NOT one of those advantages?	They are more accurate.	They have a very short settling time.	They have low maintenance and high reliability.	They can be used in high latitudes and at high speeds.
65	From those listed, which of the statements about the poles of a magnet is true?	The red pole will attract a blue pole and is the south seeking end.	The red pole will attract a blue pole and is the north seeking end.	The red pole will repel a blue pole an is the north seeking end.	The red pole will repel a blue pole and is the south seeking end.
66	The two unique properties of a free gyroscope are...	torque and rigidity in space.	precession and gyroscopic inertia.	gyroscopic inertia and spin.	spin and precession.
67	What is the main purpose of frequently recording deviation of the ship's magnetic compass in a log or compass deviation book?	To provide for accurate planning of courses in passage plans.	To provide evidence in the event of a collision, grounding or other such incident.	To enable unforeseen changes to devaition to be quickly detected.	To enable the compass adjuster to calculate the sizes and locations of the correctors.
68	The axis of a free gyroscope is pointed at a star. From those listed, which is NOT correct?	The axis will stay pointing at the star.	The axis will circle the celestial poles once in 23h56m approximately.	The axis cannot be disturbed from this direction while the rate of spin is maintained.	The axis will circle the north celestial pole in an anti-clockwise direction.
69	The point at which the helm must be applied to achieve a required course alteration is called the	wheel-over position.	way-point.	abort-point.	drift-point.
70	The angle between the magnetic north and the true north is	variation.	deviation.	compass error.	magnetic compass error.
71	How often should the auto pilot be tested in manual mode?	At least once a watch	At least once a day	At least once in a passage	Prior to arrival and departure only
72	To convert a compass course to a magnetic course, it is necessary to apply.....	deviation.	variation.	compass error.	none of the other answers.

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73	To convert a magnetic course to a true course, it is necessary to apply	variation.	deviation.	compass error.	none of the other options.
74	If Var= 8W and Dev =4W, What is the compass error?	12 W	4W	4E	12E
75	If the true transit bearing of two leading lights is read off the chart and the compass bearing of the two lights, when in transit, is taken, then the difference between the two bearings so obtained is the	compass error.	deviation.	variation.	magnetic bearing.
76	Magnetic compass - Var = 7W ; Dev = 12E ; What is the compass error?	5E	5W	19E	19W
77	If ship's head by compass was 045 (C), What is the true course if the variation is 5W and the deviation is 9.5 W?	030.5 (T)	054.5 (T)	059.5 (T)	050 (T)
78	Magnetic Compass - If var =6E ; dev =3W, What is the compass error?	3 E	3W	9E	9W

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ANSWERS	
1	B
2	B
3	D
4	B
5	C
6	D
7	A
8	B
9	A
10	A
11	B
12	A
13	D
14	C
15	B
16	A
17	A
18	C
19	B
20	A
21	C
22	A
23	B
24	C
25	C
26	A
27	B
28	B
29	C
30	B
31	B

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ANSWERS	
32	C
33	A
34	B
35	A
36	C
37	D
38	D
39	A
40	D
41	A
42	C
43	D
44	A
45	B
46	A
47	D
48	A
49	A
50	C
51	C
52	A
53	B
54	C
55	D
56	A
57	C
58	B
59	B
60	D
61	C
62	D

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ANSWERS	
63	A
64	A
65	B
66	B
67	C
68	C
69	A
70	A
71	A
72	A
73	A
74	A
75	A
76	A
77	A
78	A

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ANSWERS