



Ocean University of Sri Lanka
Aptitude Test 2022/2023
B.Sc. in Marine Engineering



NIC No. :

Index No. :

Time Allowed: **TWO hours**

Date: 12/11/2022

Instructions:

- Answer all the questions on this paper itself.
- Use a dark pencil/ black or blue ball point pen to mark the answers.
- Calculators are not allowed.

SECTION A - GENERAL KNOWLEDGE - [25 Marks]

1. What is measured by an Echo Sounder?

a) Distance to a star	b) Speed of a vessel
c) Speed of an oceanic wave	d) Depth of an ocean
2. What will be the colour of the sky for an astronaut in outer space?

a) Green	b) Purple	c) Blue	d) Black
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3. What does IMO stand for?

a) International Marketing Orientation	b) Intergovernmental Marine Opportunity
c) International Maritime Organization	d) Innovation Marquip Organization
4. What was the discovery which achieved the 2001 Nobel prize for Physics?

a) Bose-Einstein condensation	b) Theory of superconductors and super fluids
c) Cosmic X-ray sources	d) Quantum theory of optical coherence
5. One nautical mile equals?

a) 1.852 km/h	b) 1.852 km	c) 1.852 m/h	d) 1.89 km/h
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6. What is the year the Ocean University of Sri Lanka Act come into power?

a) 2014	b) 2010	c) 2016	d) 2015
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7. The purpose of choke in tube light is?

a) To decrease the current	b) To increase the current
c) To decrease the voltage momentarily	d) To increase the voltage momentarily
8. Nuclear sizes are expressed in a unit named

a) Fermi	b) Angstrom	c) Candel	d) Tesla
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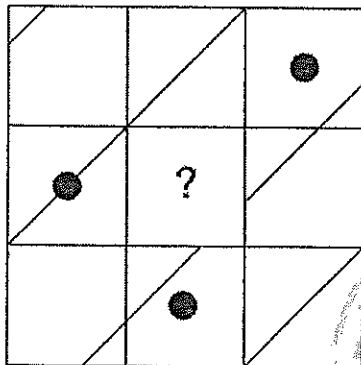
9. Who invented Internal Combustion Engine?
a) Roger Bacon b) Karl Benz c) Alan M. Turing d) Nikolaus Otto
10. Gravity-setting chambers are used in industries to remove
a) SO_x b) NO_x c) CO d) suspended particulate matter
11. Light from the Sun reaches earth nearly?
a) 2 minutes b) 4 minutes c) 8 minutes d) 16 minutes
12. Planets do not twinkle because
a) They emit light of a constant intensity
b) Their distance from the earth does not change with time
c) They are very far away from the earth resulting in a decrease in the intensity of light
d) They are nearer to earth and hence we receive a greater amount of light and therefore minor variations in the intensity are not noticeable
13. Let a thin capillary tube be replaced with another tube of insufficient length then, we find water
a) Will overflow b) Will not rise c) Depressed d) Change its meniscus
14. If two bodies of different masses, initially at rest, are acted upon by the same force for the same time, then both bodies acquire the same
a) Velocity b) Momentum c) Acceleration d) Kinetic energy
15. Which of the following properties of a wave is independent of others?
a) Amplitude b) Velocity c) Wavelength d) Frequency
16. What does the term PLC stand for?
a) Programmable Lift Computer b) Program List Control
c) Programmable Logic Controller d) Piezo Lamp Connector
17. What do we call a network whose elements may be separated by some distance? It usually involves two or more small networks and dedicated high-speed telephone lines.
a) URL (Universal Resource Locator) b) LAN (Local Area Network)
c) WAN (Wide Area Network) d) World Wide Web
18. It takes much longer to cook food in the hills than in the plains, because
a) In the hills, the atmospheric pressure is lower than that in the plains and therefore water boils at a temperature lower than 100°C causing an increase in cooking time
b) Due to low atmospheric pressure on the hills, the water boils at a temperature higher than 100°C and therefore water takes longer to boil
c) In the hills the atmospheric density is low and therefore a lot of heat is lost to the atmosphere
d) In the hills the humidity is high and therefore a lot of heat is absorbed by the atmosphere leaving very little heat for cooking
19. Inside an aeroplane, flying at a high altitude,
a) The pressure is the same as that outside
b) Normal atmospheric pressure is maintained by the use of air pumps

- c) The pressure inside is less than the pressure outside
d) Normal humidity and partial vacuum are maintained
20. The ozone layer restricts which one substance below?
a) Visible light
b) Infrared radiation
c) X-rays and gamma rays
d) Ultraviolet radiation
21. For safety, the fuse wire used in the mains for household supply of electricity must be made of metal having
a) low melting point
b) high resistance
c) high melting point
d) low specific heat
22. What inspired reflecting road lights to be invented?
a) Car door reflecting mirrors
b) The light a cat's eyes gave off on a fence
c) Sun light on steel posts on road sides
d) The sun light on the windshield
23. Who is the English inventor is known as the 'Father of Computing.'
a) Philo Farnsworth
b) J. Presper Eckert
c) John Mauchly
d) Charles Babbage
24. Which explains the concept of the Free market?
a) A condition in the international market where nations do not impose customs duty or other taxes on the import of goods
b) A market where the price of a commodity is determined by the free play of the forces of supply and demand
c) Ports that are exempted from payment of customs duty on articles of commerce, primarily to encourage tourism
d) None of the above
25. Radioactive substances can be produced readily in
a) An electron gun
b) An atomic pile
c) A transistor
d) A Wilson cloud chamber

SECTION B - IQ TEST - [50 Marks]

1. Sound travels at a different speed in media. In what order does the velocity of sound increase in these media?
a) Water, iron and air
b) Iron, air and water
c) Air, water and iron
d) Iron, water and air
2. A Sound produced at a point is heard by a person after 5 seconds, while the same sound is heard by another person after 6 seconds. If the speed of sound is 300 m/s, what could be the maximum and minimum distances between the two persons?
a) 1.8 km, 0.15 km
b) 2.2 km, 0.20 km
c) 2.8 km, 0.25 km
d) 3.3 km, 0.30 km

3. By working 5 hours/day, 4 waiters can serve 250 dishes in 8 days. 2 waiters would require how many hours/day to serve 500 dishes in 20 days?
 a) 8 hours/day b) 6 hours/day c) 7 hours/day d) 9 hours/day
4. A two-digit number is such that the product of the digit 8. When 18 is added to the number the digit are reversed. What is the number?
 a) 81 b) 42 c) 24 d) 18
5. What is the probability that a chosen number is a perfect cube if it is chosen at random from the set {1, 2, 3, ..., 100}?
 a) 1/25 b) 1/2 c) 4/13 d) 1/10
6. John, David and Linda can do a work in 90, 30 and 45 days respectively. If they work together, in how many days will they complete the work?
 a) 15 b) 10 c) 20 d) 25
7. What percent is 2 minutes 24 seconds of an hour?
 a) 8% b) 4% c) 2% d) 6%
8. Draw the contents of the middle tile following the rules of logic already established.



9. Insert numbers into the remaining blank squares so that the equals in each row and column are correct. All numbers to be inserted are less than 10 and mathematical operations are performed from left to right in rows and from top to bottom in columns.

9	÷		×		=	6
+		-		×		+
	+		-	4	=	
÷		+		-		÷
	×	3	-		=	3
=		=		=		=
5	÷		+		=	3

10. The top set of six numbers has a relationship to the set of six numbers below. The two sets of six boxes on the left have the same relationship as the two sets of six boxes on the right. Which set of numbers should therefore replace the question marks?

14	27	56	18	76	32		68	64	71	19	25	49
5	9	11	9	13	5		?	?	?	?	?	?

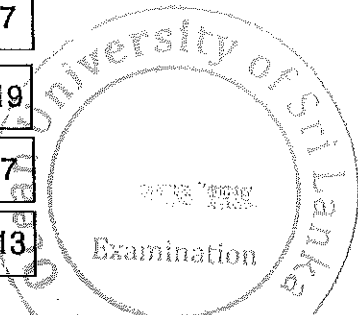
- a)

14	4	8	8	5	7
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- b)

12	9	4	18	6	19
----	---	---	----	---	----
- c)

12	10	9	8	5	7
----	----	---	---	---	---
- d)

14	10	8	10	7	13
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11. Which is the missing section in the number puzzle?

50	51	49	52	48
46	47	45	48	44
49	50		51	
47		46		45
48		47	50	46

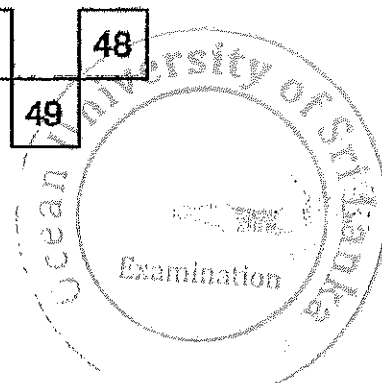
- a)

	49		47
49		48	
48			
- b)

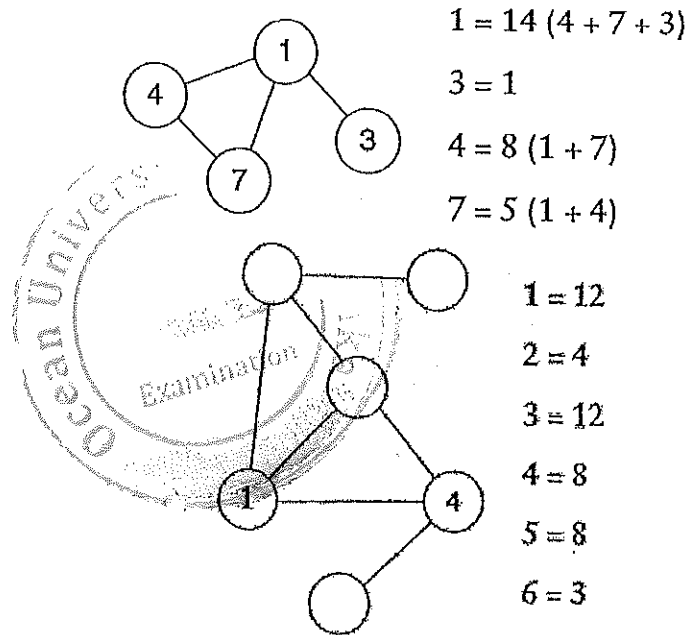
	46		48
48		49	
49			
- c)

	49		48
48		49	
47			
- d)

	48		47
48		49	
49			

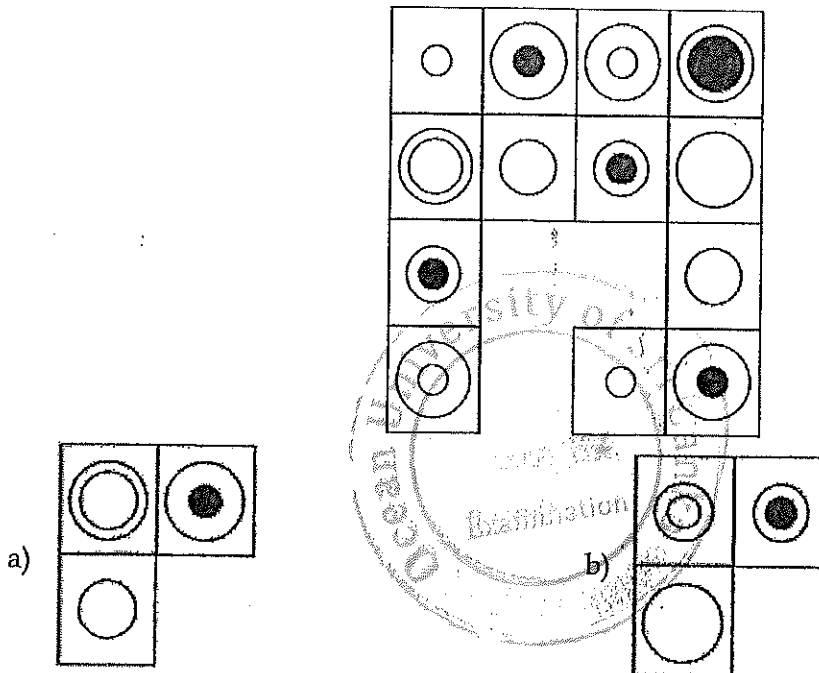


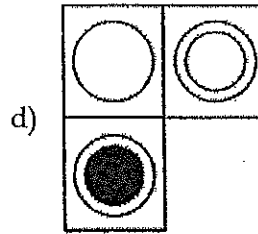
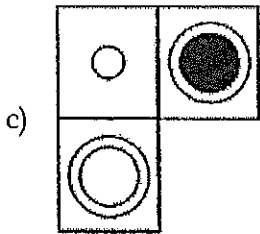
12. Insert the numbers listed into the circles so that for any particular circle the sum of the numbers in the circles connected to it equals the value corresponding to that circled number in the list. For example:



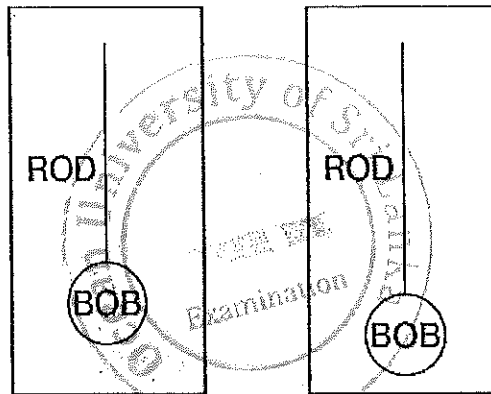
13. What number is, logically, missing from the sequence below?
 348269, 284315, _____, 8438, 4811, 842, 86 Answer:

14. Which is the missing section?





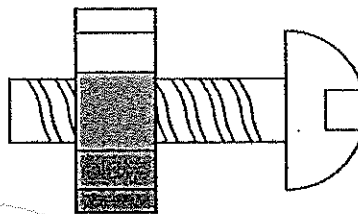
15. Referring to the pendulum figure given below



Which of the following factors is most likely to determine that the pendulums on the two clocks will swing back and forth at the same rate?

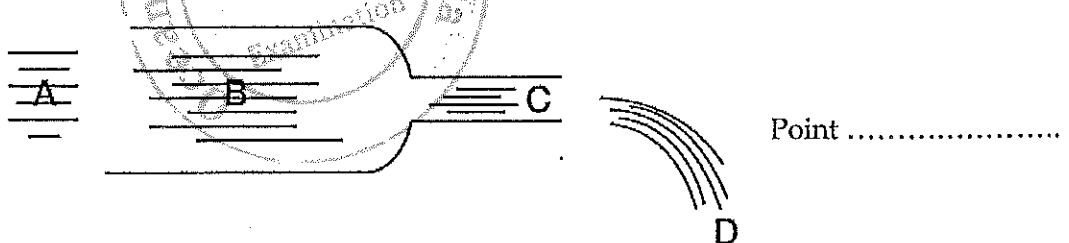
- a) The size of the pendulum arc
- b) The length of the rod or string
- c) The weight of the bob
- d) The synchronicity of the timekeeping of the two clocks

16. A nut is so tight on a screwed bolt you are having great difficulty unscrewing it. Which of the following is the most effective in freeing it?

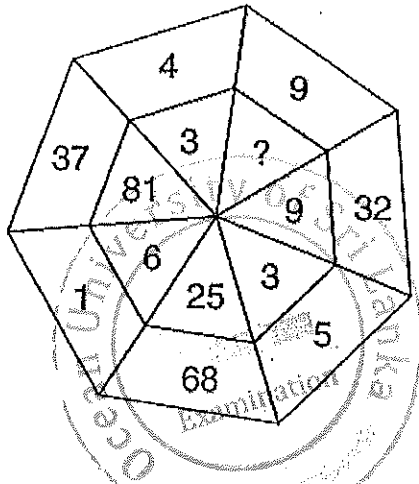


- a) Cooling it
- b) Submerging it in warm water
- c) Heating it
- d) None of the above

17. A large volume of water is gushing through a pipe which narrows at the outlet. At which point, A, B, C or D will the water flow fastest?



18. According to the pattern, what number should replace the question mark?



.....

19. Comparing the linked boxes what should be the numerical value of the question mark?

3829	4873
6952	8176
3521	9632



3235	6912
7669	1825
7338	?

.....

- 20.
- Start with a full cup of black coffee (no milk) and drink one-third of it.
 - Now pour into the cup an amount of milk equal to the coffee you have just drunk, and stir well.
 - Now drink a further half of the resultant mixture.
 - Now pour into the cup a further amount of milk equal to the mixture you have just drunk and stir well again.
 - Now drink one-sixth of the resultant mixture.
 - Now pour into the cup a further amount of milk equal to the mixture you have just drunk, stir well, and finally, drink the whole cup of liquid.

Have you drunk more milk or more coffee in total?

21. What digit should replace the question mark?

48 726 29

73 249 28

53 ? 44

.....

22. Which is the missing section?

A	G	D	K	G	R	K
F	R	N	L	A	B	D
L	B	B	E	F	N	N
K	N	R	A	L	D	B
D	D	G	G	K	K	R
N	K	A			L	G
B	L	F			F	A

a)

D	R
B	N

b)

R	D
N	B

c)

D	R
N	B

d)

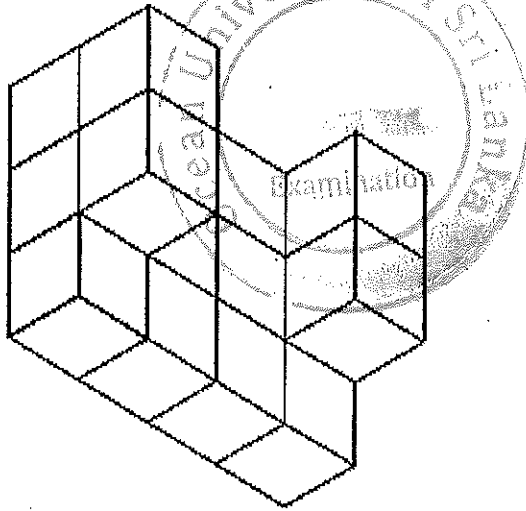
R	D
B	N

23. What numbers should replace a and b?

5	7	8	6	8	6
8	6	3	b	7	4
2	a	7	8	6	8
5	8	6	4	5	7
3	1	7	2	8	6
7	4	8	5	7	8

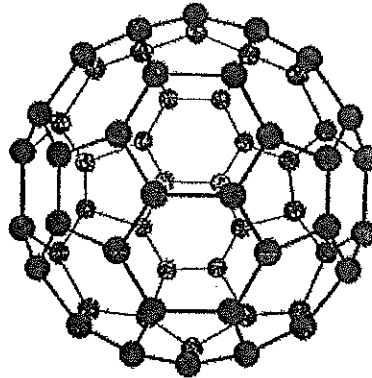
a =, b =

24. If you picked up a single cube, turned it around, and looked at it from all directions, six faces would be visible. If you picked up the figure above and looked at it from all angles and directions, how many faces would be visible?



No. of faces =

25. Buckminsterfullerene (as illustrated above) is a natural form, or allotrope, of carbon. It consists of 60 carbon atoms linked together to form an almost spherical C₆₀ molecule. Which of the following does it consist of?



- a) 20 hexagons and 12 pentagons
- b) 12 pentagons and 20 hexagons
- c) 30 hexagons and 10 pentagons
- d) 16 hexagons and 12 pentagons

SECTION C - SUBJECT KNOWLEDGE - [50 Marks]

1. It takes no more than 40 minutes to run a race, but at least 30 minutes. What equation is the willing model this in m minutes?
 - a) $|m - 35| \leq 5$
 - b) $|m + 5| < 5$
 - c) $|m - 35| > 5$
 - d) $|m + 35| \geq 5$
2. Abby works at a car dealership and receives a commission, c . Her commission is a per cent of the profit the dealership makes from the sale, which is the difference between the price of the car, p , and the value of the car, v . How much, in LKR, does the dealership earn per transaction?
 - a) $p(v - 0.01c)$
 - b) $(p - v)(0.01c)$
 - c) $(p - v)(1 - c)$
 - d) $(p - v)(1 - 0.01c)$

3. A solution made up of 40% alcohol by volume is mixed with 4 litres of a solution that is 10% alcohol by volume. How much, in litres, of the 40% alcoholic solution is needed to make a mixture that is 25% alcohol by volume?
 a) 3.2 litres b) 3.5 litres c) 3.8 litres d) 4.0 litres
4. a/b and b/c are integers. Which of the following need not be an integer?
 a) a/c b) $(a+c)/b$ c) $(a+b)/b$ d) $(b-c)/b$
5. Evaluate the following expression. $7((5+2) - (5 \times 8))^2$
 a) -87 b) 16 c) 7623 d) 5242
6. If a student drops a stone from a cliff of a height of 30 m and the time it takes to reach the ground is 3 s, then the acceleration due to gravity is
 a) 20 ms^{-2} b) 10 ms^{-2} c) 4.8 ms^{-2} d) 6.67 ms^{-2}
7. The horizontal distance travelled by a ball if it's thrown with an initial velocity of 20 ms^{-1} at an angle of 30° is
 a) $20\sqrt{3} \text{ m}$ b) 20 m c) 60 m d) $60\sqrt{3} \text{ m}$
8. Equation which measures alternating voltage is
 a) $V \sin(\omega t)$ b) $\sin(t)$ c) $V_m \sin(\omega t)$ d) $V = IR$
9. The average power dissipated in a resistor if a sinusoidal power source of peak value 25 V is connected across a 20Ω resistor is
 a) 15.625 W b) 31.25 W c) 50 W d) 12.5 kW
10. Liquid A and liquid B exert the same amount of pressure on each other, but the density of A is twice the density of B. If the height of liquid B is 10 cm, then the height of liquid A would be
 a) 10 cm b) 5 cm c) 40 cm d) 20 cm
11. The total capacitance of a 300 mF capacitor and a 600 mF in series is
 a) 300 mF b) 500 mF c) 200 mF d) 1000 mF
12. The ideal gas equation is
 a) $PV = \text{constant}$ b) $PT = \text{constant}$ c) V/T d) $PV = nRT$
13. Law which relates pressure and volume of gas is
 a) Charles's law b) Boyle's law c) Avogadro's law d) Ideal gas law
14. Which of the following energy conversion devices convert heat into work?
 a) Electrical Generators b) IC engines c) Condensers d) All of the above
15. The unit of Young's modulus is
 a) kg/cm^2 b) kg/cm c) kg d) N/m^2

16. When heat is transferred from one particle of a hot body to another by the actual motion of the heated particles, it is referred to as heat transfer by
 a) conduction b) convection c) radiation d) saturation
17. Heat is closely related with
 a) liquids b) energy c) temperature d) enthalpy
18. The study of force which produces motion in a fluid is called as
 a) fluid statics b) fluid dynamics c) fluid kinematics d) fluid motions
19. The unit of temperature in S.I. units is
 a) Centigrade b) Celsius c) Fahrenheit d) Kelvin
20. The unit of power in S.I. units is
 a) Newton b) Pascal c) Watt d) Joule
21. In a steady, ideal flow of an incompressible fluid, total energy at any point of the fluid is always constant. This theorem is known as
 a) Bernoulli's theorem b) Reynold's theorem
 c) Euler's theorem d) Navier-stokes theorem
22. In an isolated system, _____ can be transferred between the system and its surrounding.
 a) only energy b) only mass
 c) both energy and mass d) neither energy nor mass
23. If a gas is heated against a pressure, keeping the volume constant, then the work done will be equal to
 a) +ve b) -ve c) zero d) pressure x volume
24. Forces are called coplanar when all of them acting on the body lie in
 a) one point b) one plane
 c) different planes d) perpendicular planes
25. The unit of pressure in S.I. units is
 a) kg/cm² b) Pascal c) Bars d) mm

SECTION D - ENGLISH LANGUAGE - [30 Marks]

1. Rewrite the following sentences in Passive Voice.

a) Oil spills cause marine pollution.

b) The captain ordered the crew to muster.

c) Does piracy affect the shipping industry?

d) The watchkeeper did not see the icebergs.

.....
e) They took the injured passenger to the ship's hospital.
.....

2. Combine the following sentences using **the most suitable conjunction** from the brackets. Write the sentence in the space provided.

a) The passenger fell overboard. He was careless. (unless, but, because)
.....

b) We were sailing across the Atlantic Ocean. We saw dolphins. (while, before, if)
.....

c) The cadet was ill. He went on working. (even though, if, for)
.....

d) The motorman saw the fire in the engine room. He ran out of the engine room. (after, while, though)
.....

e) The weather is rough. The journey will be postponed. (if, nor, either)
.....

3. Form questions for the following sentences. Use question words.

a)
It is situated in the Indian Ocean.

b)
The ETA of the CSCL Vancouver is 0200 hrs.

c)
The notice says that the event will begin at 9 am.

d)
The second officer informed them about the incident.

e)
They said that our results have been released.

4. Fill in the blanks using appropriate prepositions.

Discovery of the Titanic Shipwreck

After the sinking of the Titanic (1)(at, on, in) April 15 (2)
..... (at, on, in) 1912, the great ship lay beneath the waters of the
Atlantic Ocean for over 70 years (3) (before, in, between) its
wreckage was discovered. On September 1, 1985, a joint American-French expedition,
headed by famous American oceanographer Dr Robert Ballard, found the Titanic (4)
..... (besides, behind, over) two miles (5)
..... (out of, below, over) the ocean's surface by using an
unmanned submersible called Argo. This discovery gave new meaning to the Titanic's
sinking and gave birth to new dreams in ocean exploration.

Built (6) (under, at, in) Ireland (7)
(from, into, to) 1909 (8) (from, into, to) 1912 on behalf of the
British-owned White Star Line, the Titanic officially left its final European port of

Queenstown, Ireland on April 11, 1912. Carrying (9) (over, from, until) 2,200 passengers and crew, the Titanic began its maiden voyage (10) (into, across, out of) the Atlantic, headed for New York.

5. Underline the correct form of the verb.
- a) I thought Ann (came/has come/was coming) to see me yesterday, but she didn't (came/comes/come).
 - b) I (am writing/will write/have written) for my degree at the end of this year.
 - c) Sandra (go/gone/went) to Spain last week. She (has/had/is having) a good time.
 - d) We (had/have/were having) breakfast after my friend (had come/came/was coming) to see me last morning.
 - e) We were calculating the costs when our boss (was walking/walked/walks) into our office.

