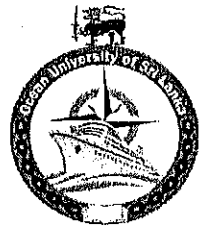




Ocean University of Sri Lanka



Aptitude Test 2023

B.Sc. (Hons) in Marine Engineering

NIC NO:

INDEX NO:

Time Allowed: Two hours (02 hours)

Date: 09/12/2023

INSTRUCTIONS:

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

SECTION A – GENERAL KNOWLEDGE [25 marks]

- Which ocean is known for the "Bermuda Triangle"?
(a) Indian (b) Pacific
(c) Arctic (d) Atlantic
- An Astronomical Unit (AU) is the average distance between the Earth and the Sun. What is the value of 1AU?
(a) 109.5×10^5 km (b) 129.5×10^5 km
(c) 149.5×10^5 km (d) 179.5×10^5 km
- What is the purpose of the International Maritime Organization (IMO)?
(a) Marine life conservation (b) Weather forecasting
(c) Navigation mapping (d) Maritime safety and security
- In which year the Ocean University of Sri Lanka Act came in to power?
(a) 2012 (b) 2013
(c) 2014 (d) 2015
- In Marine Engineering "IMO number" stand for;
(a) Unique identification number for the ship
(b) Engine model of the ship
(c) Radio frequency for communication
(d) Maximum cargo capacity

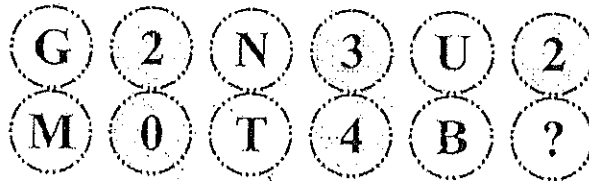
6. What is the primary focus of Engineering Economics?
 - (a) Minimizing production or the service costs
 - (b) Maximizing profits
 - (c) Increasing market share
 - (d) Balancing social, environmental, and economic factors
7. What is the goal of Sustainable Engineering Economics?
 - (a) Ignoring economic factors
 - (b) Minimizing environmental impact
 - (c) Maximizing short-term profits
 - (d) Reducing social considerations
8. Which economic indicator reflects the overall health of a country's economy and influences on Engineering decisions?
 - (a) Gross Domestic Product (GDP)
 - (b) Inflation rate
 - (c) Unemployment rate
 - (d) Consumer Price Index (CPI)
9. In which ocean the Mariana Trench, the deepest part of the world's oceans, is located?
 - (a) Atlantic
 - (b) Southern
 - (c) Indian
 - (d) Pacific
10. In which ocean the world's largest coral reef system, 'Great Barrier Reef' is located?
 - (a) Pacific
 - (b) Atlantic
 - (c) Indian
 - (d) Southern
11. Which economic concept is concerned with the measurement of changes in the general price level of goods and services?
 - (a) Interest rate
 - (b) Inflation
 - (c) Depreciation
 - (d) Opportunity cost
12. What is the primary purpose of a "sonar" in the context of oceans?
 - (a) Communication
 - (b) Measurement of ocean depth
 - (c) Harvesting seafood
 - (d) Navigation
13. What is the primary purpose of the Automatic Identification System (AIS) in Marine Engineering?
 - (a) Communication with shore stations
 - (b) Cargo tracking
 - (c) Monitoring marine life
 - (d) Navigation and collision avoidance
14. What is the primary cause of coral bleaching in oceans?
 - (a) Rising sea temperatures
 - (b) Pollution
 - (c) Tsunamis
 - (d) Overfishing
15. What is the cause of ocean pollution?
 - (a) Industrial waste
 - (b) Oil spills
 - (c) Plastic
 - (d) All of the above

16. Which country is not belonging to the Organization of the Petroleum Exporting Countries (OPEC)?
- (a) Angola (b) Saudi Arabia
(c) Thailand (d) Kuwait
17. What is the last capital of 'Maya rata' which was located in the Southwestern part of Sri Lanka?
- (a) Anuradhapura (b) Polonnaruwa
(c) Parakramapura (d) Magapura
18. Who was the king in the last Sinhala Kingdom ruled by when it was came to the end in 1815?
- (a) Kithsiri Mewan (b) Sri Wickrama Rajasinghe
(c) Maha Parakkramabahu (d) Rajadhi Rajasinha
19. How many districts and provinces in Sri Lanka?
- (a) 24 Districts and 9 provinces (b) 25 Districts and 9 provinces
(c) 23 Districts and 8 provinces (d) 26 Districts and 10 provinces
20. The term "Maritime Pollution" primarily refers to;
- (a) Noise pollution from ships (b) Oil spills and chemical discharges
(c) Light pollution in coastal areas (d) Air pollution caused by ship engines
21. What is the purpose of an echo sounder in Marine Engineering?
- (a) Depth measurement (b) Engine performance monitoring
(c) Weather forecasting (d) Communication with other ships
22. Which organization sets global standards for the design, construction, and maintenance of ships?
- (a) Institute of Marine Engineering, Science and Technology (IMarEST)
(b) Society of Naval Architects and Marine Engineers (SNAME)
(c) International Maritime Organization (IMO)
(d) Marine Engineers' Beneficial Association (MEBA)
23. What is the term for a giant sea wave caused by an underwater earthquake or volcanic eruption?
- (a) Tsunami (b) High tide
(c) Typhoon (d) Hurricane
24. According to their surface temperature, the warmest to coldest oceans are;
- (a) Indian & Pacific (b) Atlantic & Indian
(c) Indian & Arctic (d) Pacific & Atlantic

25. The main cause for tides is;
- (a) Earth quick
 - (b) Storm
 - (c) Gravitational forces exerted on the earth by the sun
 - (d) Gravitational forces exerted on the earth by the moon

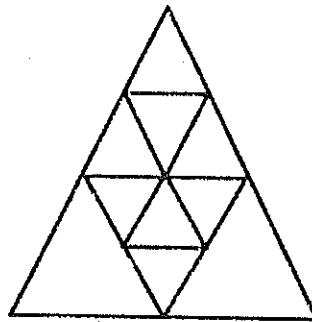
SECTION B – IQ TEST [25marks]

1. Which number completes the sequence.



- (a) 2
- (b) 1
- (c) 3
- (d) 4

2. How many triangles do you see in the picture?

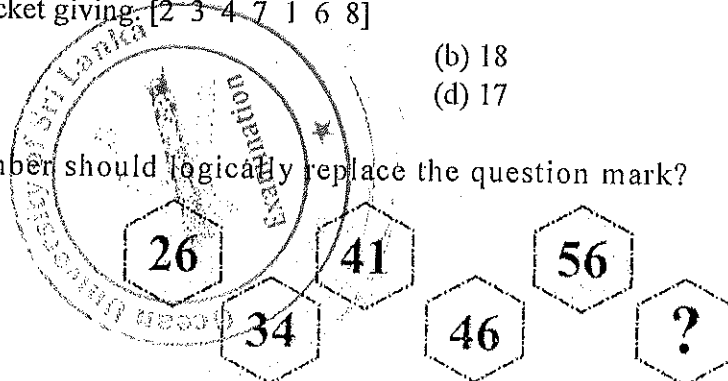


- (a) 9
- (b) 13
- (c) 11
- (d) 12

3. Multiplying the second-highest odd number and the second lowest even number in the square bracket giving: [2 3 4 7 1 6 8]

- (a) 20
- (b) 18
- (c) 19
- (d) 17

4. What number should logically replace the question mark?

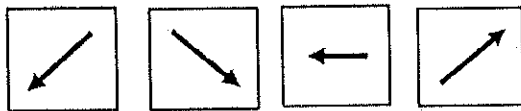
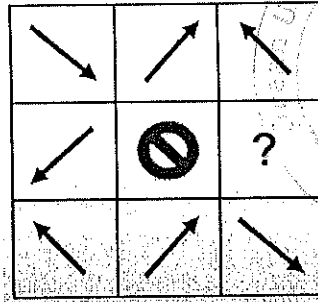


- (a) 34
- (b) 67
- (c) 64
- (d) 57

5. You have accidentally left the plug out of the bath and are attempting to fill the bath with both taps full on. The hot tap takes three minutes to fill the bath and the cold tap takes two minutes, and the water empties through the plughole in six minutes. In how many minutes will the bath be filled?

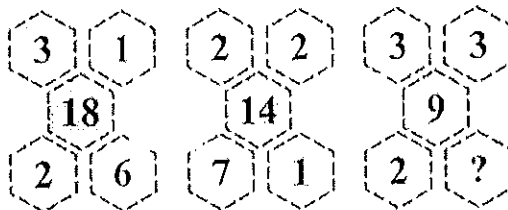
(a) 1.0 (b) 3.0
(c) 5.0 (d) 1.5

6. Determine the missing part of the figure given bellow.



(A) (B) (C) (D)
(a) C (b) B
(c) A (d) D

7. Which number is missing from the last grid?



(a) 1 (b) 5
(c) 6 (d) 8

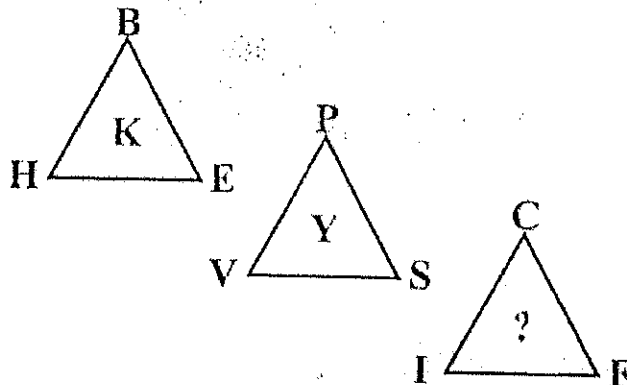
8. Add all the odd numbers together that are immediately followed by an even number given in the square bracket. [629473168274923]

(a) 23 (b) 20
(c) 26 (d) 25

9. If the word SIDE is written under the word BOAR, the word CALM is written above the word BOAR and the word DOME is written under the word SIDE, what word is produced reading diagonally from the top left-hand corner to the bottom right-hand corner?

(a) CODE (b) BODE
(c) LOAD (d) MODE

10. If I walk 2 miles east, then 1 mile south, then 1 mile east, then 2 miles north and finally 3 miles west, how far am I, and in what direction, from my starting point?
 (a) 1 mile East (b) 1 mile North
 (c) 2 mile North (d) 2 mile North
11. Select the correct number at the question mark given bellow.
 7 9 5 11 4 15 12 7 13 8 11 ?
 (a) 8 (b) 10
 (c) 11 (d) 13
12. A car travels at a speed of 40 m/hr over a certain distance and then returns over the same distance at a speed of 60 m/hr. What is the average speed for the total journey?
 (a) 30 m/hr (b) 40 m/hr
 (c) 60 m/hr (d) 48 m/hr
13. Mary spends $\frac{1}{3}$ of her 24-hour day at work. Meetings take $\frac{1}{4}$ of her work day. How many hours does she spend in meetings?
 (a) 1 hr 30 min (b) 2 hr
 (c) 2 hr 30 min (d) 3 hr
14. Which letter goes in the middle of the third triangle



- (a) K (b) L
 (c) Y (d) Z
15. If two people eat 2 slices of pizza in 2 minutes, how many people will it take to eat 18 pieces of pizza in 6 minutes?
 (a) 4 (b) 5
 (c) 6 (d) 7
16. The store reduces the price of one product by 20 percent. How many percent do you need to raise to the percentage to get the original price?
 (a) 25 (b) 27
 (c) 30 (d) 35

17. A patch of lily pads covers an area within a lake, and the patch doubles its size every day. If it takes 48 days for the lilies to cover the entire lake, how long does it take to cover half the lake ?
- (a) 12 days (b) 24 days
(c) 47 days (d) 96 days
18. Assume you're driving the bus from New York to Boston. Fifteen people get on the bus in New York, and only one person gets off the bus when you reach your destination in Boston. What's the name of the bus driver ?
- (a) Driver's name lives in New York (b) Boston
(c) Cannot say (d) My name
19. A bag contains 4 red balls and 6 blue balls. Two balls are drawn at random. What is the probability that both balls are red?
- (a) $\frac{4}{5}$ (b) $\frac{1}{3}$
(c) $\frac{6}{23}$ (d) $\frac{2}{15}$
20. Mary is 16 years old. She is 4 times older than her brother. How old will Mary be when he is twice his age?
- (a) That is impossible (b) 20
(c) 24 (d) 28
21. Which number should appear at the end in the sequence?
- 11 12 14 18 26 ?
- (a) 34 (b) 42
(c) 54 (d) 66
22. There are 5 machines that make 5 parts in 5 minutes. How long does it take to make 100 parts on 100 machines?
- (a) 5 (b) 10
(c) 15 (d) 30
23. How many bricks, each measuring 25 cm x 11.25 cm x 6 cm, will be needed to build a wall of 8 m x 6 m x 22.5 cm?
- (a) 5600 (b) 6000
(c) 6428 (d) 6200

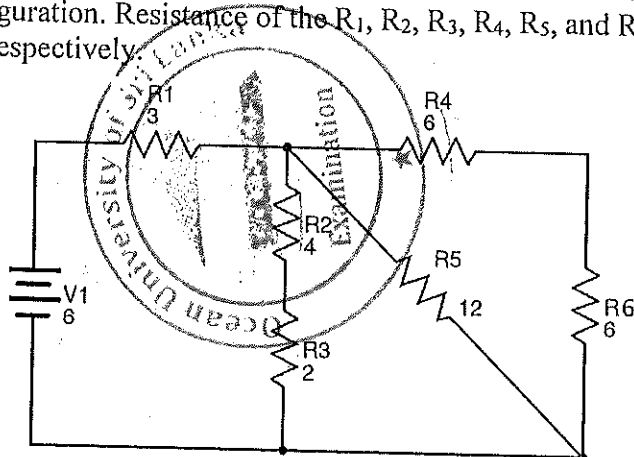
24. I picked a basket full of apples from my orchard. By the time I arrived home, I had given away 75 percent to my son, 0.625 of the remainder to my son's neighbor and then eaten one of the remainders: I arrived home with just two apples. How many apples did I originally pick from my orchard?
- (a) 32 (b) 28
(c) 30 (d) 33
25. Two people can make two bicycles in 2 hours. How many people are required to make 12 bicycles in 6 hours?
- (a) 1 (b) 2
(c) 4 (d) 6

SECTION C – SUBJECT (ENGINEERING) KNOWLEDGE [25marks]

1. A Newton is equal to;
- (a) Kilogram-meter per second (b) Meter per second squared
(c) Kilogram-meter per second squared (d) Kilogram per meter-second
2. Electric current may be measured in which one of the following units?
- (a) Coulombs/volt (b) Joules/coulomb
(c) Coulombs/second (d) Ohms/second
3. For an object moving in a uniform circular motion, the direction of the instantaneous acceleration vector is
- (a) Directed radially outward (b) Directed radially inward
(c) Tangent to the path of motion (d) Equal to zero
4. A pendulum which is suspended from the ceiling of a railroad car is observed to hang at an angle of 10 degrees to the right of the vertical. Which of the following answers could explain this phenomena?
- (a) The railroad car is at rest.
(b) The railroad car is accelerating to the left.
(c) The railroad car is moving with a constant velocity to the right.
(d) The railroad car is accelerating to the right.
5. A ball leaves a girl's hand with an upward velocity of 6 m/s. What is the maximum height of the ball above the girl's hand and the velocity of the ball at 1 m displacement from the girl's hand?
- (a) 1.8 m, and 16 m/s (b) 1.8 m, and 4 m/s
(c) 18 m, and 4 m/s (d) 18 m, and 16 m/s

6. A certain machine exerts a constant force of 450 N on a box whose mass is 10 kg. The machine moves the box a distance of 20 m along a horizontal rough floor with the friction coefficient of 0.5. What is the velocity of the box at the end of the motion if the initial velocity of the box is zero?
- (a) 42.5 m/s (b) 40 m/s
(c) 37.5 m/s (d) 35 m/s
7. In a certain electronic circuit, the output is positive if input 1 is positive and input 2 is zero. If both inputs are positive the output is zero. This would be;
- (a) an AND gate (b) a NOR gate
(c) an OR gate (d) a High-pass filter
8. The potential difference across a 4Ω resistor is 20 V. Assuming that all of the energy dissipated by this resistor is in the form of heat, how many joules of heat are radiated in 10 seconds?
- (a) 8000J (b) 800 J
(c) 1000 J (d) 100 J
9. When a charge moves through an electric circuit in the direction of an electric force it does one of the following four things. Does it:
- (a) Lose potential energy and gain kinetic energy
(b) Gain potential energy and lose kinetic energy
(c) Lose both potential and kinetic energy
(d) Gain both potential and kinetic energy
10. Gauss' law of electricity, Gauss' law of magnetism, Faraday's law of induction, and Amperes' law form the basic equations of electromagnetism. This combination is collectively known as:
- (a) Coulomb's equations (b) Volta's equations
(c) Fermi's equations (d) Maxwell's equations
11. Which of the following physical properties is TRUE for most dense ceramic materials?
- (a) High tensile strength (b) Good ductility
(c) High compressive strength (d) High electrical conductivity
12. The causes of 'Temporary hardness' and 'Permanent hardness' of water are;
- (a) 'Presence of magnesium sulphate' and 'Presence of calcium carbonate'
(b) Presence of magnesium sulphate and 'Presence of calcium bicarbonate'
(c) 'Presence of sulphates and chlorides of calcium and magnesium' and 'Presence of calcium and magnesium bicarbonates'
(d) 'Presence of calcium and magnesium bicarbonates' and 'Presence of sulphates and chlorides of calcium and magnesium'

13. Find the equivalent resistance and the current drawn from the battery of 6 V of the following configuration. Resistance of the R_1 , R_2 , R_3 , R_4 , R_5 , and R_6 are $3\ \Omega$, $4\ \Omega$, $2\ \Omega$, $6\ \Omega$, $12\ \Omega$, and $6\ \Omega$ respectively.



- (a) $1\ \Omega$, 6 A (b) $3\ \Omega$, 2 A
(c) $6\ \Omega$, 1 A (d) $12\ \Omega$, 0.5 A
14. Which one of the following substances does not have a specific melting point?
(a) Bromine (b) Mercury
(c) Sodium chloride (d) Glass
15. What is the third most abundant gas found in the air we breathe?
(a) Carbon dioxide (b) Argon
(c) Oxygen (d) Hydrogen
16. The purest form of iron is;
(a) Steel (b) Stainless steel
(c) Wrought iron (d) Pig iron
17. Which of the following are chemical changes?
A. Cooking of Food
B. Digestion of Food
C. Freezing of water
D. Heating of water
(a) All the above (b) A & B
(c) C & D (d) A, B & C
18. Permanent Hardness of water can be removed by adding;
(a) Bleaching powder (b) Washing soda or soda ash
(c) Chlorine (d) Potassium permanganate
19. The Statue of Liberty is green because of
(a) Green stone (b) Oxidized brass
(c) Oxidized copper (d) Steel painted green

20. In Engineering Economics, what does the term "depreciation" refer to?
(a) Increase in project costs
(b) Increase in the value of assets
(c) Profit earned from investments
(d) Reduction in the value of assets over time
21. To convert temperatures from degrees Celsius to Fahrenheit,
(a) Multiply by 5/9 and add 32.
(b) Multiply by 9/5 and add 32.
(c) Divide by 32 and add 9/5.
(d) Divide by 32 and add 5/9.
22. Nitrous oxide, commonly called laughing gas, has been a matter of concern to environmentalists recently because;
(a) It is thought to cause cancer at low concentrations
(b) It produces photochemical smoke
(c) It is a greenhouse gas
(d) None of the above
23. Most commercial nuclear power plants worldwide are cooled by
(a) Water
(b) Mercury
(c) Helium gas
(d) Lubricant oil
24. Hull of the Titanic ship was failed due to the;
(a) Ductile failure under low water temperatures and high impact loading.
(b) Brittle failure under low water temperatures and high impact loading.
(c) Extreme weather conditions.
(d) Sea waves and flooding
25. Which material is commonly used for the construction of ship hulls?
(a) Nickle base super alloys
(b) Fiberglass
(c) Mild Steel
(d) Cast iron

SECTION D – ENGLISH LANGUAGE [25marks]

1. Choose the one that is best from the following sentences.
(a) One of the musicians who is Eric has been looking for a practice room.
(b) Eric, one the musicians, are looking for a practice room.
(c) Eric who is one of the musicians who are looking for a practice room.
(d) Eric, one of the musicians, is looking for a practice room.
2. The workers left early and _____ home.
(a) gone
(b) went
(c) have dinner
(d) drives

3. You are given four choices of how the following two sentences can be combined. Choose the best answer.

The traffic was heavy. I was late to work.

- (a) I was late to work because the traffic was heavy.
(b) I was late to work, so the traffic was heavy.
(c) The traffic was heavy, I was late to work.
(d) The traffic was heavy; and then I was late to work

Read the paragraph and choose the left-out words

It used to be common for dentists to have to remove teeth. However, with modern technology, (4) _____ visits to the dentist's office and good (5) _____ hygiene at home, most people can keep (6) _____ teeth for their entire lives.

4.

- (a) the
(b) frequent
(c) regular
(d) rare

5.

- (a) dental
(b) person
(c) cleaning
(d) brushing

6.

- (a) their
(b) his
(c) front
(d) clean

Select the correct answers in question 7 and 8.

7. Could you please tell me where _____ ?

- (a) the office is located. (b) is located the office.
(c) is the office located. (d) the office locate.

8. Several _____ sent an e-mail to the instructor.

- (a) student (b) of students
(c) of the student (d) of the students

From question 9 to 10, select the incorrect piece in the sentences below.

9. Joe is one of the friend who graduated from college last year.

- (a) (b) (c) (d)

10. I still haven't decide which classes to take next fall.

- (a) (b) (c) (d)

From question 11 to 12, select the correctly joined sentence among the choices below.

11.

- (a) The man was filing a police report who his car had been stolen.
(b) The who was filing a police report, his car had been stolen.
(c) The man whose care had been stolen, he was filing a police report.
(d) The man whose car had been stolen was filing a police report.

12.

- (a) Sam didn't really understand the instructions, however, he did what he was told.
- (b) Not really understanding the instructions, but Sam did what he was told.
- (c) Though he didn't really understand the instructions, Sam did what he was told.
- (d) Even though Sam didn't really understand the instructions, but did what he was told.

From question 13 to 15, fill in the blanks with appropriate articles.

Use 'an', 'a' or 'the' appropriately in the sentences given below.

- 13. ___ Eiffel Tower lights up at night.
- 14. Charles Babbage is considered as ___ father of computers
- 15. Sharon will take ___ train from the next stop.

From question 16 to 20, go through the sentences given below and identify the voice used whether it is active voice or passive voice.

- 16. Shreya Ghoshal sings beautiful songs.
- 17. The Sun sets in the West.
- 18. The boy was being beaten by his teacher.
- 19. Bucky is helped by Steve.
- 20. The carpenter is building the desk.

Fill in the blanks with the correct modals

- 21. I arrange the flowers for the bouquet. (may/can)
- 22. I borrow this pen from you? (may/might)
- 23. The teacher ask you to bring the homework. (might/can)
- 24. According to the weather forecast, it snow heavily tomorrow. (may/shall)
- 25. Raj hasn't studied well. He fail his exam. (might/shall)

-----THE END OF THE PAPER-----

