



Negombo Education zone

Second Term Evaluation 2024

Grade 10 - Science

Paper I



2024-09

Admission Number

Time Duration 01 Hour

Instructions:

- Answer all the questions. 40 marks for this paper.
- Select the correct answer from the answers 1, 2, 3, 4 to questions 1 to 40.

(1) . The structural and functional unit of life is

- 1) Cell 2) Tissue 3) Organ 4) System

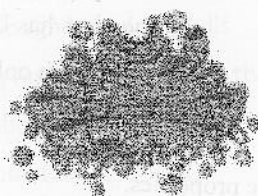
(2) Which of the following instances is used to reduce friction?

- 1) Application of roll bearings 2) Cutting grooves in tires
3) Use of a ring when climbing trees 4) Cutting grooves in shoes

(3). What is the molecule with the highest number of atoms?

- 1) CCl_4 2) $Ca(OH)_2$ 3) $CO(NH_3)_2$ 4) H_2SO_4

(4) . Two organelles present in a cell are shown in the figure below.



Function of those organelles respectively,

- 1) Protein synthesis, Respiratory reactions
2) Production of secretory substances, Protein synthesis
3) Respiratory reactions, Production of secretory substances
4) Production of secretory substances, Respiratory reactions

(5). ${}_{19}^{39}K^{+}$ The number of electrons and protons in this ion respectively,

- 1) 20 and 19 2) 18 and 19 3) 19 and 19 4) 18 and 20

(6). The formula of the hydroxide of the element X is $X(OH)_2$. What is the formula for chloride of X?

- 1) XCl_2 2) X_2Cl 3) X_2Cl_2 4) XCl

(7) . Some of the organic compounds contained in living matter, the chemicals used to identify them, and the observations obtained are shown in the table below. Choose the option that matches correctly.

	Organic compound	Chemicals used for identification	Observation
1	Starch	Copper sulphate	Dark blue
2	Protein	Iodoine solution	Purple
3	Lipids	Sodium hydroxide	Pink
4	Glucose	Benedict solution	Brick red precipitate

(8). Which of the following oxides is basic?

- 1) Al_2O_3 2) SiO_2 3) SO_2 4) MgO

(9). A vitamin that is necessary for the formation of components needed for blood clotting in the human body is

- 1) Vitamin C 2) Vitamin D 3) Vitamin E 4) Vitamin K

(10). Number of moles in 20g of CaCO_3 (Ca = 40, C = 12, O = 16)

1) 20

2) 2

3) 0.2

4) 0.02

(11). Choose the answer that includes the groups of organisms that contribute to the formation of a lichen

1) Fungi and algae

2) Marchantia and Fungi

3) Algae and Bacteria

4) Marchantia and Algae

(12)

Name of the compound	Boiling point / °C	Melting point / °C
A. Calcium Oxide	2580	2850
B. Sulphur dioxide	-73	-10

Which compound/compounds contain covalent bonds?

1) Sulphur Dioxide

2) Calcium Dioxide

3) Both Sulphur dioxide and Calcium oxide

4) Not in both compounds

(13) The answer containing a pair of bivalent elements is,

1) Al, B

2) Al, O

3) Be, B

4) Be, O

(14) An object is projected vertically upwards with a velocity of 30ms^{-1} . How long does the object take to fall back to the ground? (Gravitational acceleration 10ms^{-2})

1) 3 s

2) 30 s

3) 6 s

4) 10 s

(15) An object has a mass of 600g at sea level. What is its weight when it is taken to the top of Mount Pidurutthalagala? (Gravitational acceleration 10ms^{-2})

1) Less than 6N

2) 6N

3) More than 6N

4) 6N or above

(16). Which of the following is false about viruses?

1) A virus is 1000 times the size of a bacterium.

2) The virus has DNA or RNA

3) Metabolism occurs within the virus

4) A virus can only function inside living cells.

(17). Below is some information about a particular element.

a) Used in welding metals.

b) Shows metallic properties as well as non-metallic properties.

c) Used to make skin creams.

This element can be,

1) Aluminium

2) Silicon

3) Boron

4) Carbon

(18). The total number of atoms in one mole of H_2O

1) $6.022 \times 10^{23} \times 3$

2) $6.022 \times 10^{23} \times 2$

3) $6.022 \times 10^{23} \times 1$

4) $6.022 \times 10^{23} \times \frac{1}{3}$

(19) For two forces to be in equilibrium, what is not a characteristic of the two forces?

1) The two forces are equal in the magnitude

2) The two forces are equal in the direction

3) The two forces act along the same line

4) The two forces are coplanar

(20) When forming an ionic bond, atoms are

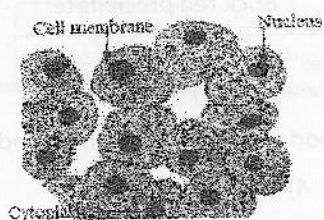
1) Giving and gaining protons

2) Giving and gaining electrons

3) Sharing protons

4) Sharing electrons

(21) The below figure shows



1) Plant cells as seen through a light microscope.

2) Animal cells as seen through a light microscope.

3) Plant cells as seen through an electron microscope.

4) Animal cells as seen through an electron microscope.

(22) A meter ruler is hung in the middle and a mass of 500g is hung at the 30cm mark. What mass should be hung at the 100cm mark to balance the meter ruler?

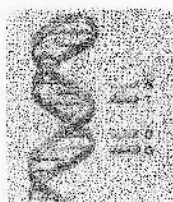
- 1) 100g 2) 200g 3) 300g 4) 400g

(23) Given below are some properties of covalent compounds.

- A) Most of the compounds are liquids or gases at room temperature
B) Have low melting and boiling points.
C) Their aqueous solutions conduct electricity.
Which of the above statements is true?

- 1) Only A and B 2) Only A and C 3) Only B and C 4) A, B and C

(24) The structure of the DNA molecule is shown in the figure below.



Choose the **false** statement from the given statements.

- 1) This molecule contains the elements carbon, hydrogen, oxygen, nitrogen, and phosphorus.
2) Its building unit is ribonucleotide
3) These store the genetic information of organisms.
4) It contains the information that controls the biological functions in the cell.

(25) Which factor does not affect the limiting frictional force?

- 1) Nature of the surface 2) Surface area of the contact surface
3) Normal reaction acting between surfaces 4) Smoothness of the contact surface

(26) Which of the following is an instance of collinear force acting in the same direction?

- 1) Pulling a rope by two groups of people 2) A group of fishermen pulling a fishing net
3) Pushing a plough by pair of bulls 4) Pushing a vehicle by several people

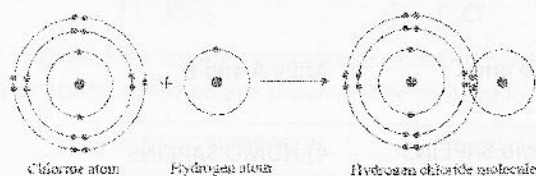
(27) The collection of building and breaking down that occurs in living cells is

- 1) called metabolism 2) called differentiation
3) called combination 4) called growth

(28) A force of 60N is applied to the east and 55N to the west on a trolley. The direction and magnitude of the resultant force is,

- 1) 5N to east 2) 5N to west 3) 10N to east 4) 10N to west

(29) The bond arrangement of the hydrogen chloride molecule (HCl) is shown in the figure below



The number of lone pairs of electrons in this molecule

- 1) 1 2) 2 3) 3 4) 4

(30). Consider the following statements regarding tissue culture

- A= Separating the plantlets and placing them in test tubes to grow further
B = Allowing the new roots and buds to be developed from the callus.
C = Introducing the part of vegetative tissue obtained from the mother plant into the culture medium.
D = Let the new plantlets to get adapted to natural conditions to be cultivated in the field.

The correct sequence to be followed in tissue culture is,

- 1) A, B, C, D 2) B, A, C, D 3) C, B, A, D 4) C, B, D, A

(31) Which of the following is the most accurate definition of resultant force?

- 1) The value obtained by the difference between two forces
- 2) The force applied as a sum of several forces
- 3) A single force that gives the result of several forces
- 4) The highest force selected from among several forces.

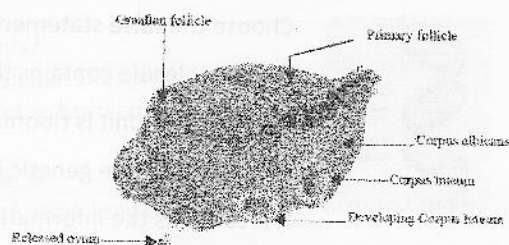
(32) Molar mass of H_2S and H_2O respectively (H = 1, O = 16, S = 32)

- 1) 18, 34
- 2) 18gmol^{-1} , 34gmol^{-1}
- 3) 34, 18
- 4) 34gmol^{-1} , 18gmol^{-1}

(33) A cross-section of an ovary with different stages of an ovum is shown in the figure below.

At which stage in the ovary does a primary follicle gradually become a mature graafian follicle?

- 1) Luteal phase and Follicular phase
- 2) Secretory phase
- 3) Luteal phase
- 4) Follicular phase



(34) A hormone produced by the male reproductive system.

- 1) Oestrogen
- 2) Progesterone
- 3) Testosterone
- 4) FSH Hormone

(35) Below are 3 facts presented by three students to define a couple of forces.

- a. A pair of forces of equal magnitude.
- b. A pair of forces opposite in direction.
- c. A couple of forces cause the object to rotate around a point between the two forces.

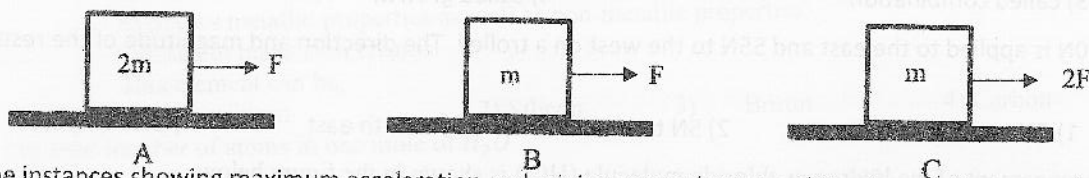
The correct statements are,

- 1) Only a and b
- 2) Only b and c
- 3) Only a and c
- 4) All a, b, c

(36) Which of the following is not a major biomolecule in living matter?

- 1) Carbohydrate
- 2) Lipid
- 3) Vitamin
- 4) Protein

(37) The figure shows 3 instances where 3 objects A, B, and C are placed on the same surface and different forces are applied.



The instances showing maximum acceleration and minimum acceleration of the above objects are shown respectively,

- 1) By C and B
- 2) By C and A
- 3) By B and C
- 4) By A and B

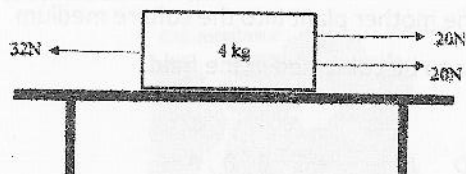
(38) The correct scientific name for man is,

- 1) Homo Sapiens
- 2) Homo sapiens
- 3) Homo SAPEINS
- 4) HOMO SAPEINS

(39) A pair of organelles that can be observed with a light microscope.

- 1) Mitochondria, Chloroplast
- 2) Ribosome, Golgi complex
- 3) Vacuole, Ribosome
- 4) Nucleus, Vacuole

(40) Three forces applied on a 4 kg object are shown in the figure below. At this time the acceleration of the object is,



- 1) 4 ms^{-2}
- 2) 8 ms^{-2}
- 3) 0.5 ms^{-2}
- 4) 2 ms^{-2}

2024-09



Negombo Education Zone
Second Term Evaluation 2024
Grade 10 - Science
Paper II



Admission No

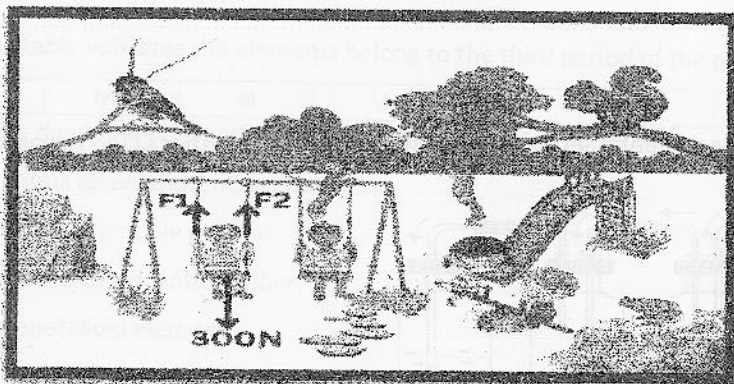
Time Duration 03 Hours

Instructions :

- Answer all four questions in Part A within the space provided.
- Answer only three of the five questions in Part B.
- After providing the answers, submit the Part A and answer sheets of Part B together.

Part A – Structured Essay

1. Following picture shows a playground.



(A)

(i) Name an organism that can be identified from the above picture of a playground which belongs to each of the following group.

- a) Aves
 b) Mammalia

(02 marks)

(ii) Write down a similar and dissimilar characteristic can be seen in Aves and Mammalia.

(02 marks)

(iii) A child in this diagram ran away from a dog running towards him. What is the characteristic of organisms relevant to the above incident? (01 mark)

(B) Following elements are the most commonly found elements in living organisms.

C, H, O, N

Provide answers for the questions based on the above elements.

- (i) What is the element found in the form of an atomic lattice? (01 mark)
 (ii) What is the element which forms a homo atomic molecule with a triple bond? (01 mark)
 (iii) Following isotopes are the element isotopes of oxygen.



a) Define isotopes.

b) What is the type of sub atomic particle different in isotopes?

(C)

(I) If the weight of the child on the swing is 300N, what are the values of F_1 and F_2 forces?

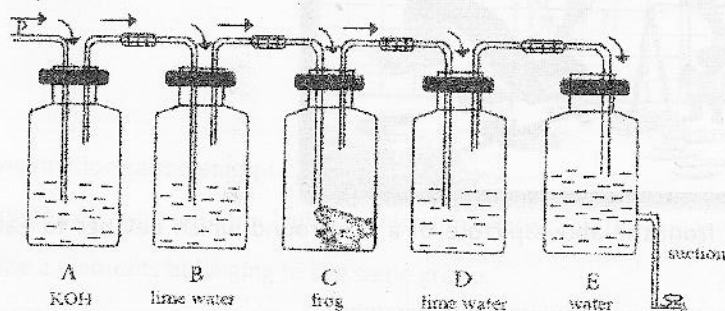
(II) Write down a characteristic can be seen in the forces W and F_1 , F_2 when the child is in equilibrium on the swing.

(III) The mass of a child on the sea-saw is 30kg. This child is 150cm away from the axis of rotation of the sea-saw. What is the moment of force exerted on the sea-saw by this child?

(IV) There should be a less friction on the inclined surface of a slider. Mention a measure can be taken to reduce the friction in an above instance.

(02)

(A) Following diagram shows an experimental setup arranged to experiment whether CO_2 is released during respiration.



(I) What is the initial step that should be followed when this experiment is done?

(II) What is the use of the solution in A vessel?

(III) What could be observed in D vessel?

(IV) Mention another specimen that can be replaced instead of the frog in the vessel C.

(V) Mention a change that should be done in the above experiment, if a control experiment should be arranged.

(B) Carbohydrates, Proteins, Lipids and nucleic acids are the bio molecules in organisms.

(I) What is the common formula of carbohydrates?

(II) What are the constituent elements always found in proteins

(III) Mention a significance of lipids

(IV) To which process of organisms, do the variations occurred due to mutations of DNA contribute? (01 mark)

(C) Scientists Introduced cell theory based on the facts revealed by observing different live tissues through the microscope. (01 mark)

(I) Mention a statement of the cell theory.

(II) Name the scientists who put forward the cell theory. (01 mark)

(III) Name the specimen you have used to observe the following cells under the light microscopes. (01 mark)

(a) Animal cell -

(b) Plant cell -

(02 marks)

(IV) What is meant by the typical cell?

(01 mark)
(15 marks)

3) (A) The following table indicates the elements belong to the third period of the periodic table.

Na	Mg	Al	Si	P	S	Cl	Ar
----	----	----	----	---	---	----	----

Write down the relevant element suitable for the following statements.

(a) Forms an amphoteric oxide.

(b) Exists as a noble gas.

(c) Is used to vulcanize rubber.

(d) A metalloid element.

(e) Shows least electronegativity.

(01 mark x 5)

(B) Complete the following table relevant to the X and Y elements.

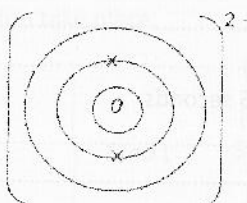
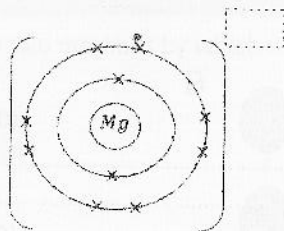
(01 mark x 5)

Element	Number of neutrons in the atom	Number of protons in the atom	Mass number	The period of the element	The group of the element	Valency
X	14	13	a)	3	b)	3
Y	18	c)	35	d)	VII	e)

(C) (I) Magnesium oxide is an ionic compound which is formed by magnesium and oxygen.

(a) State the charge of magnesium of magnesium oxide in the square given. (01 mark)

(b) Mark the electrons of the last shell of the oxide ion in the diagram. (01 mark)



(II) Write down an observation can be seen when magnesium is burnt in air.

(01 mark)

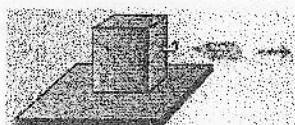


(III) The product formed when the magnesium was burnt in air was collected and added some water into it. After that the solution was tested with blue and red litmus papers. Mention your observations here and the reason for that observation.

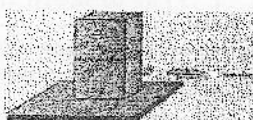
Observation :- (01 mark)

Reason :- (01 mark) (15 marks)

4) A) Following figures show how the forces are exerted by a spring balance towards uniform cuboid shaped objects, which each one of it weighs 20N. ($g = 10\text{ms}^{-2}$)



A



B



C

(I). According to the situations A and B, is the force exerting to move the object B, less or greater than the force exerting to move the object A? (01 mark)

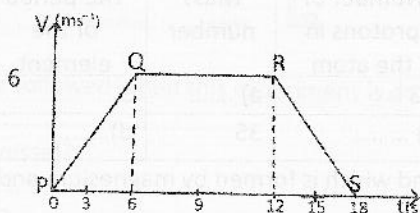
(II). What is the relationship between the mass and acceleration of the object according to the situations A and B? (02 marks)

(III). If the force exerted on the object in situation C is 60N, calculate the acceleration of the object in that instance. (02 marks)

(IV). When considering about the motion of situations A and B, What is the relationship between the normal reaction and the limiting frictional force? (01 mark)

(V). There is no notable change among the fibers of a coir rope although a huge force is applied. What is the reason for this? (01 mark)

(B) Following velocity time graph shows a motion of an object of a linear road.



(I). Mention the type of motion in the following instances of the graph (03 marks)

a) PQ -

b) QR -

c) RS -

(II). Calculate the acceleration of the object in first 6 seconds. (01 mark)

(III). What is the deceleration of the object in first 6 seconds? (01 mark)

(IV). Calculate the displacement of the object in first 6 seconds. (01 mark)

(V).What is the displacement of the object when it moves 18 seconds?

(02 marks)

(15 marks)

Part B

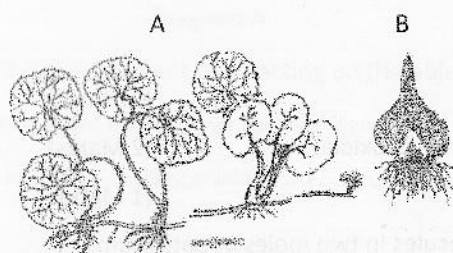
- Answer only three of the five questions in Part B.

5 (A) Given below are a few non-vertebrate animals.

A-Cockroach	B-Leech	C-Sea Anemone	D-Starfish	E-Squid
-------------	---------	---------------	------------	---------

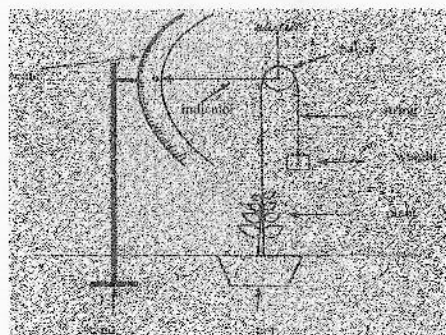
- Name the kingdoms to which A, B, C, D and E belong. (1 Mark)
- Mention the phyla to which C and D belong. (2 Marks)
- Write down the letter of an animal whose body shows bilateral symmetry. (1 Mark)
- Mention the letter of the animal which belongs to phylum Annelida. (1 Mark)

(B) The following diagrams show a few instances where vegetative propagation takes place.



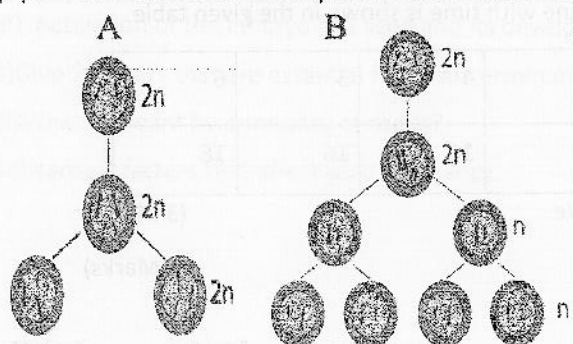
- What plant part is responsible for vegetative propagation in each of the instances given above? (2 Marks)
- Give an advantage and a disadvantage of vegetative propagation. (2 Marks)
- What vegetative propagation method can be used to grow a new plant from a Jasmine twig? (1 Mark)

(C) The apparatus shown below was designed by students to observe the growth of a plant.



- What is the above apparatus called? (1 Mark)
- Write down the importance of the scale of this apparatus. (1 Mark)
- Name 01 thing that you should be concerned about when hanging a weight from this apparatus (1 Mark)
- After a cell grows it is subjected to differentiation. What is meant by differentiation? (2 Marks)

(D).There are two methods by which cell division take place.



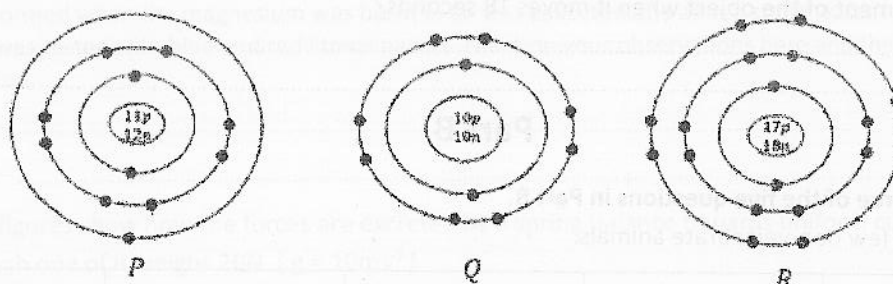
- Name cell division methods A & B. (2 Marks)

- What cell division methods are represented by Step I & II in method B? (2 Marks)

- Write down an importance of cell division Method A and B separately. (1Mark)

(20 Marks)

(6) (A) Shown below are diagrams showing the sub atomic particles of three atoms (Not shown with standard symbols).



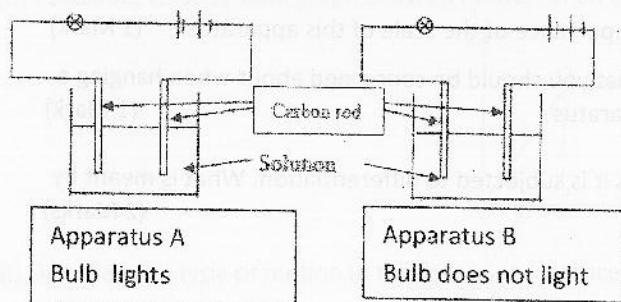
- (I) Name elements P, Q & R. (3 Marks)
- (II) Write the mass number and atomic number of element R in the standard way. (2 Marks)
- (III) Write the electronic configuration of element Q. (1 Mark)
- (IV) Consider element P
 - a) What is its physical state at room temperature? (1 Mark)
 - b) How is it stored in the laboratory? (1 Marks)

(B) Shown below is the label on a package containing Potassium hydroxide.

KOH
K = 39
O = 16
H = 1

- (I) Define relative molecular mass. (2 Marks)
- (II) Calculate the relative molecular mass of potassium hydroxide. (2 Marks)
- (III) What is the molar mass of potassium hydroxide? (1 Mark)
- (IV) What is the number of potassium hydroxide molecules in two moles of potassium hydroxide? (2 Marks)

(C) Given below are two apparatus named A & B used for an activity in the laboratory (Solutions used are Sodium chloride, sugar solution, distilled water and copper sulphate).



- (I) What solutions can be used in apparatus A? (2 Marks)
- (II) What is the type of bond that exists between water molecules? (1 Mark)
- (III) What special characteristics are shown by water due to the bonds you mentioned in II) (2 Marks)

(20 Marks)

(7). (A) The displacement of an object travelling north on a straight line with time is shown in the given table.

Time (s)	0	1	2	3	4	5	6
Displacement (m)	0	4	8	12	16	16	16

- (I) Draw the displacement-time graph for the linear motion given above. (3 Marks)
- (II) Find the velocity during the first 4 seconds. (2 Marks)

- (III). Describe the motion of the object in the time period between 4s-6s. (1 Mark)
- (IV). Draw the velocity-time graph for the motion of this object. (3 Marks)
- (B) A jack fruit weighing 3 kg took 5 s to fall to the ground from a jack tree.
- I. Calculate the velocity of the jack fruit in the moment it hits the ground ($g=10\text{ms}^{-2}$). (2 Marks)
- II. Draw the velocity-time graph for the motion of the jack fruit. (2 Marks)
- III. Calculate the momentum of the jackfruit when it falls to the ground. (2 Marks)
- IV. Calculate the height by which the jack fruit was hanging on the tree. (2 Marks)
- (C) The following diagrams show how a student applied forces on two objects.

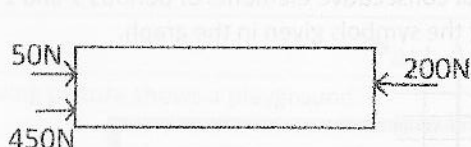


Diagram A

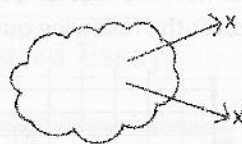
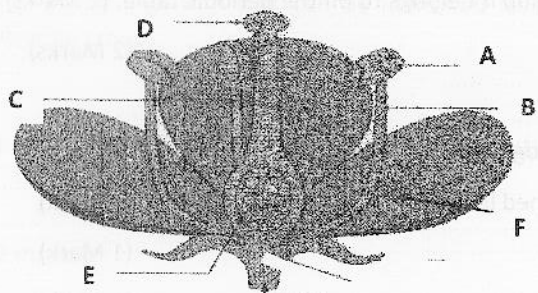


Diagram B

- I. Find the resultant force acting on the object shown in diagram A. (1 Mark)
- II. Draw the direction of the resultant force acting on diagram B. (1 Mark)
- III. Name an instance where an object is in equilibrium under three parallel forces. (1 Mark)

(20 Marks)

- 8) (A) The structure that bears the sexual parts of a plant is the flower. The longitudinal section of a typical flower is given below.



- (I) Name the letters that denote the parts of the Gynoecium. (1 Mark)

- (II) Name A & B. (2 Marks)

- (III) Is the flower shown here, a unisexual flower or a bisexual flower? (1 Mark)

- (IV) Explain the answer you provided in (iii) (2 Marks)

- (V) The part denoted by the letter F of the flower shown above is colourful. What would be its agent of pollination? (1 Mark)

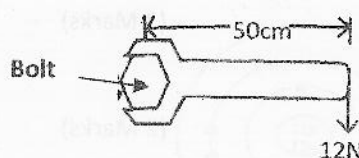
- (B) Activation of the embryo in a seed and its development to form a seedling is known as seed germination.

- (I) Give 2 factors that are essential for seed germination. (2 Marks)

- (II) What is meant by dormancy of seeds? (1 Mark)

- (III) Name 2 factors that affect seed dormancy. (2 Marks)

(C). The following diagram shows an instance where a spanner is being used to tighten a bolt.



(I). Find the moment acting on the handle of the spanner.

(1 Mark)

(II). What is the direction of the bolt's rotation during that instance?

(1 Mark)

(III). Suggest a way to increase the momentum in the instance given above whilst using the same force of 12 N. (2 Marks)

(IV) What is meant by couple of forces?

(2 Marks)

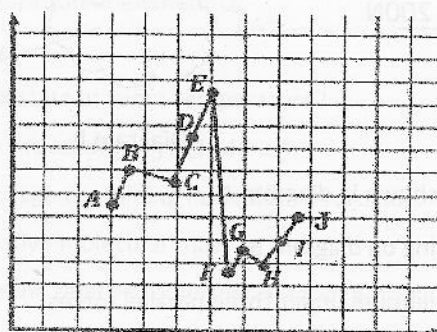
(IV). Name 2 instances where couple of forces are used.

(2 Marks)

(20 Marks)

(9) (A) The graph below illustrates how the first ionisation energy of consecutive elements of periods 1 and 2 vary with their atomic number. Answer the following questions using the symbols given in the graph.

First Ionisation
Energy
(kJmol^{-1})



Atomic No

(I) Define first ionisation energy.

(2 Marks)

(II) Name the element with the highest ionisation energy and the group it belongs to on the periodic table. (2 Marks)

(III) Name 2 elements belonging to the same group.

(2 Marks)

(IV) Consider element B,

(a) Draw the Lewis structure of the compound it forms with hydrogen.

(2 Marks)

(b) What is the type of bond found in the compound you mentioned in (a)

(1 Mark)

(V) Name the element that makes an atomic lattice.

(1 Mark)

(VI) Give an example for an ionic lattice.

(1 Mark)

(B) Drivers should be cautious when riding vehicles and for this it is important to properly follow traffic rules.

(i) Why is it important for the driver to wear the seat belt when driving a vehicle?

(2 Marks)

(ii) Write down the Newton's Law of motion related to the answer you mentioned in (i).

(2 Marks)

(iii) The maximum speed limit at which you can drive your vehicle on days with heavy rainfall is 15ms^{-1} .

(a) What do you think is the reason for this restriction?

(2 Marks)

(b) Explain the answer you mentioned above scientifically.

(2 Marks)

(20 Marks)