Minuwangoda Education Zone

Second Term Test - 2023

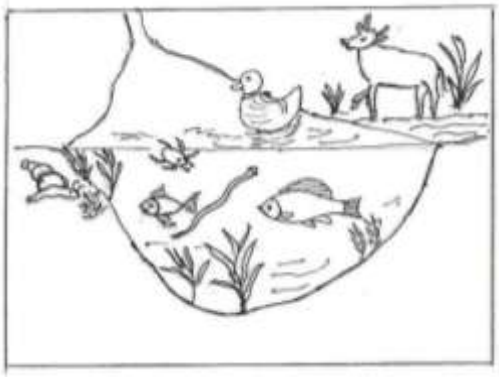
Grade 11

Science II Time : 3 hours

$Part - A$

∗ **Answer for all questions.**

(1) The following diagram shows a picture of a fresh water ecosystem.



(i) When classifying the organisms in the picture, name the group which they belong to,

A Snail ……

B Fish ……

C Spider ……

D Duck ……

(2 marks)

(ii) Select and write the organisms that have the following characteristics.

(a) Possess ear lobes ……

(b) Invertebrate ……

(c) Eyes are without eye lids ……

(d) Cold-blooded and laying eggs ……

(2 marks)

(iii) The following biochemical reaction takes place in living organisms.

$C_6H_{12}O_6 + 6O_2 \longrightarrow$ Gas + Water + Energy

(a) Name the biochemical process involved in the above reaction (1 mark)

……

(b) Write the balanced chemical equation for this process. (2 marks)

……

(c) A player was given 270g of glucose before the start of the game. How many moles of glucose did he get? $(C - 12,\ O - 16,\ H - 1)$ (2 marks)

……

……

(d) He performed sports with energy derived from the burning of glucose.
Find the number of moles of CO_2 gas released during the game. (2 marks)

……

……

(iv) (a) If the athlete takes part in a 1000m race and finishes the race in 3 minutes, Find his speed in meter per second (2 marks)

……...

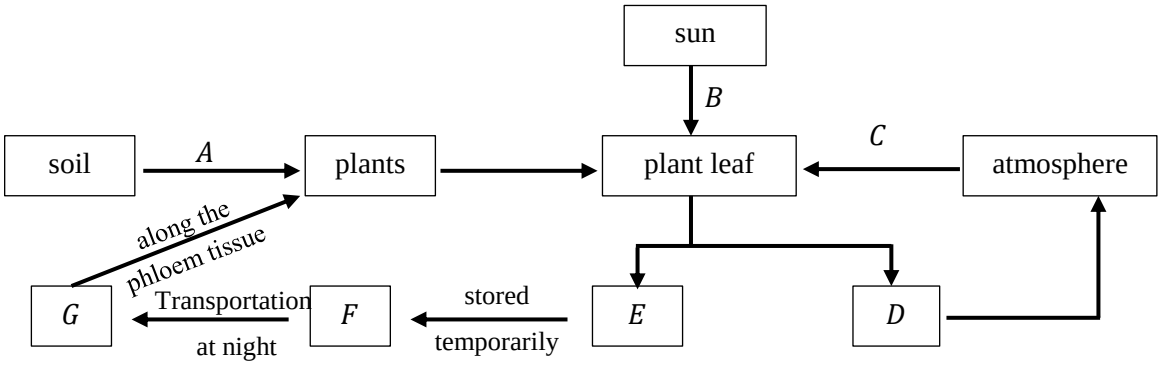
……...

(b) What is the force require to given an acceleration of $12\ ms^{-2}$ to a 500g mass? (2 marks)

……...

……...

(2) (A) The interrelationships between the biological activities of plants are shown in the following diagram.



(i) Name the things the plant gets as A, B, C

A. ……..... C. …….....

B. ……

(ii) Name the things which are produced in the plant as D, E, F, G

A. …… C. ……..……

B. …… D. …….....

(iii) Name the group of organic compound of E, F, G (1 mark)

……..

(iv) (a) Name the process of transportation of soil water to the plant body. (1 mark)

……...

(b) Name the tissue which transports 'A' into the plant leaf. (1 1/2 marks)

……...

(c) Name a non-living cell in the above tissue. (1 1/2 marks)

……...

(d) Explain why the above tissue is called a complex tissue. (1 mark)

……...

(v) A sample of the aqueous solution of 'F' was placed on a white porcelain plate and a drop of iodine solution was added to it.

(a) What is the colour of the iodine solution (1 marks)

……...

(b) Mention the colour change that occurs when iodine falls on the 'F' (1 marks)

……...

(c) Name a product formed by hydrolysis of 'G' (1 marks)

……...

(vi) (a) 'F' stored in plants is digested in the human digestive system.
Name the enzyme that helps to the digestion of 'F' Name the gland or organ that secretes above enzyme.

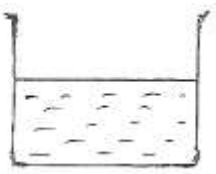
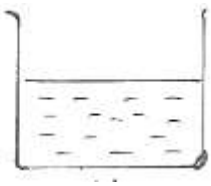
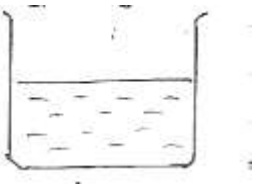
Enzyme - ……

Gland / Organ - …… (2 marks)

(b) Name the special structure in the small intestine for the absorption of end products of digestion in humans. (1 marks)

……...

(3) (A) X, Y, Z are the aqueous solutions. $(C = 12\,, H = 1\,, O = 16\,, Na = 23)$

Ethnanol $5cm^3$ (C_2H_5OH)	Glucose $5g$ $(C_6H_{12}O_6)$	Caustic Soda $5g$ $(NaOH)$
		
x	y	z
$100cm^3$ Solution	$100g$ Solution	$1\,dm^3$ Solution

(i) Select and write the appropriate solutions to express the composition as follows.
(a) Composition of a mixture in terms of mass/volume.
(b) Composition of a mixture as a volume fraction.
(c) Composition of a mixture as a mass fraction.
(3 marks)

(ii) (a) Find the amount of $NaOH$ moles in setup 'Z' (2 marks)

……...

……...

(b) Find the concentration of solution 'Z' (1 mark)

……...

……...

(iii) (a) Which of the above solution conducts electricity? (1 mark)

……...

(b) What is the reason for choosing the above solution to conduct electricity? (1 mark)

……...

……...

(B)

(i) Find in the blanks in the following equation to find the relative atomic mass.

Relative atomic mass $=$ ……

mass of a ${}^{12}_{6}C$ atom $\times$ ……

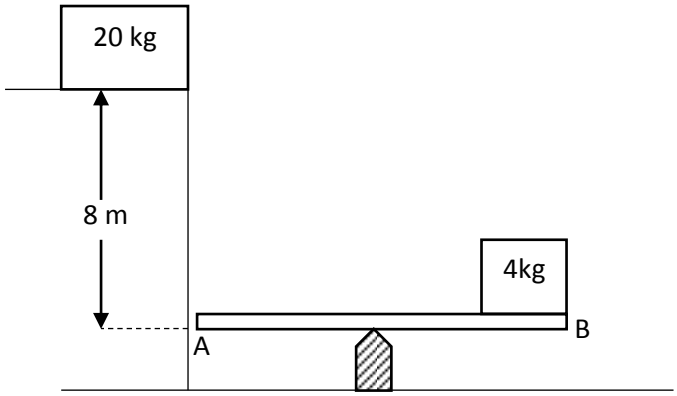
(ii) Draw the dot-cross diagram for the compound CH_4. (2 marks)

(iii) Write two characteristics by which the above compound differs from an ionic compound. (2 marks)

……..

……..

(4) A mass of 20kg is placed 8m above a see saw. It was made to fall to the 'A' edge of the seesaw as shown in the figure. Then the object of mass 4kg at end 'B' moves upwards.(g $= 10ms^{-2}$)



(A)

(i) Find the potential energy of the object of mass 20kg at the height of 8m. (1 mark)

……..

……..

(ii) When the object hits on the edge 'A' half of its kinetic energy is transferred to the mass of 4kg and it moves upwards.

(a) Find the kinetic energy when the mass of 20kg hits on the edge 'A' (1 mark)

……...

……...

(b) Find the velocity of 4kg. (2 marks)

……...

……...

(c) Find the time taken by the object to reach its maximum height. ($g = 10ms^{-2}$) (1 mark)

……...

……...

(d) What is the maximum height to which the 4kg object rises? (2 marks)

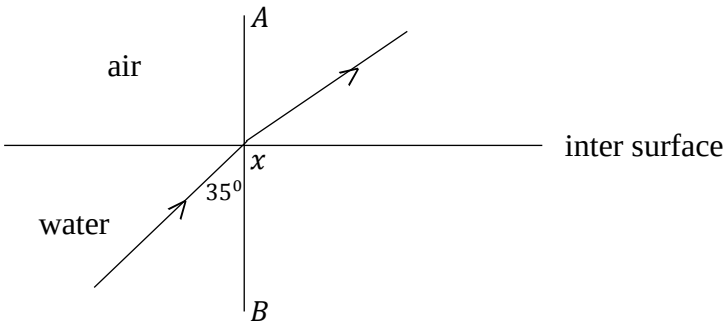
……...

……...

(e) The object moves to a maximum height and returns to the initial position. Draw the velocity - Time graph for this motion. (2 marks)

(B)

(i) The following ray diagram shows the flowing of light ray from water to air.



(a) Name the point x (1 mark)

……...

(b) What is referred as $A - B$ (1 mark)

……...

(c) Mark the angle of refraction as 'r' (1 mark)

(d) $\frac{\sin 35^\circ}{\sin r} = n$ Name 'n' (1 mark)

……...

(ii) Fill in the blanks

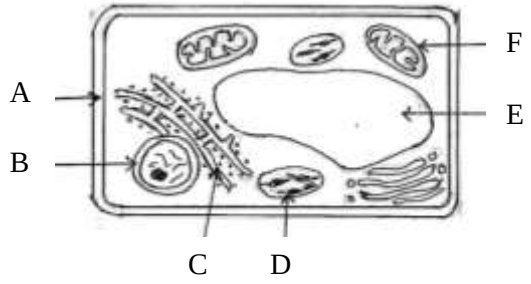
(a) When the angle of incident is increased than the critical angle, the light ray under goes ..... (1 mark)

(b) ..... are used to turn the light ray by 180^0. (1 mark)

$Part - B$

∗ **Write answers for only 3 questions.**

(5) (A) The figure shows a diagram of a typical plant cell.



(i) Name the parts A, B, C, D, E, F (3 marks)

(ii) Name 2 organelles that are not found in animal cells. (2 marks)

(iii) Name the organelle associated with C

(iv) Write 2 functions of 'B' (2 marks)

(v) The main function of 'D' is photosynthesis. Name an external factor necessary for this, process. (1 mark)

(vi) Name the fluid containing in 'E' (1 mark)

(B) The function of the ovary in the human female reproductive system is developing and releasing egg cells (Ovum) for fertilization.

(i) Name the 2 main phases in which this process takes place in the ovary. (2 marks)

(ii) What happens during fertilization? (2 marks)

(iii) Name the place where fertilization occurs in the female reproductive system. (2 marks)

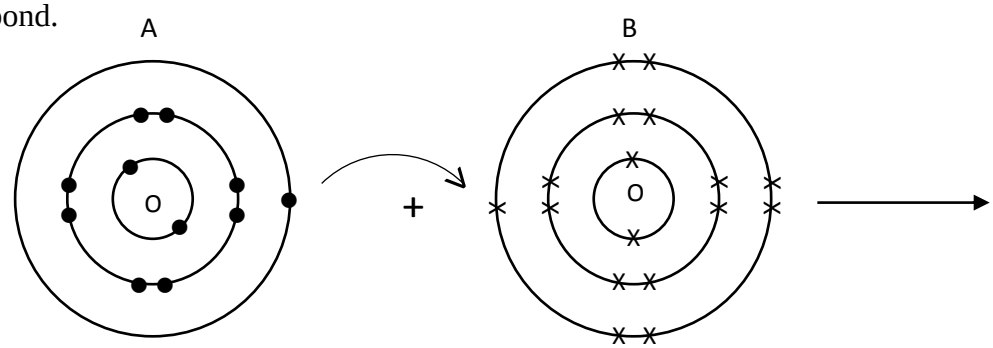
(iv) Sexual reproduction is more advantageous to organisms than asexual reproduction.

(a) Mention an advantage of sexual reproduction that is not achieved by asexual reproduction.

(b) What is the pollination in a flower. (2 marks)

(c) Name 2ways in which pollination takes place. (2 marks)

(6) (A) The following diagram shows the way of exchanging electrons between atoms "a" and "b" during the formation of a bond.



(i) Draw the new form of 'A' and 'B' after the exchanging the elections. (2 marks)

(ii) What becomes a negative ion here? (1 mark)

(iii) What type of bond is formed between 'a' and 'b'? (2 marks)

(iv) Identify the elements 'A' and 'B' . Name them. (2 marks)

(v) Write the chemical name of the compound obtained by combining 'A' and 'B' (2 marks)

(vi) To which period of the periodic table does element 'A' belong? (1 mark)

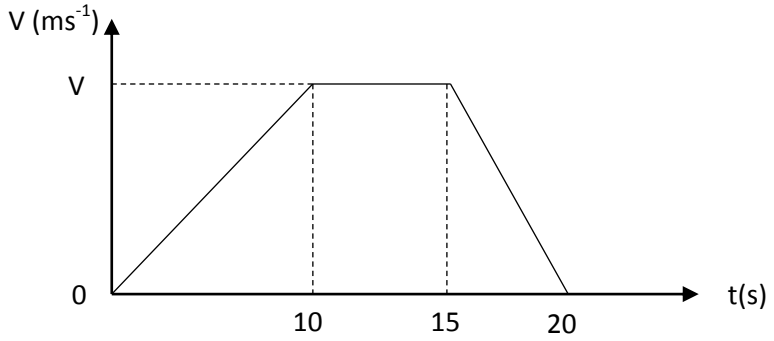
(vii) Write the electronic configuration of an element, belonging to the third group of the period to which 'A' belong. (1 mark)

(B) The following table shows some elements in the 2nd and 3rd periods of the periodic table. The given letters are not real symbols.

	i	ii	iii	iv	v	vi	vii	viii
2nd period				P		Q		R
3rd period	S	T				U	V	

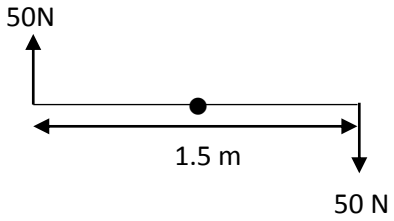
(i) (a) To which group do elements whose valence shell is complete belong? (1 mark)
(b) Write the symbol of such an element. (1 mark)
(ii) What is the symbol for a diatomic gas. (1 mark)
(iii) (a) Write the electronic configuration of element 'V' (1 mark)
(b) Which ion does 'V' form? (1 mark)
(iv) Write the formula of the compound formed by 'T' and 'V' (2 marks)
(v) Name three forms of element 'P' (3 marks)

(7) (A) An object of mass 30kg moves down an inclined plane from rest and falls on a smooth plane. It moves with uniform velocity on the smooth plane and then moves along the rough plane and come to rest. The following velocity - Time graph shows above motion.

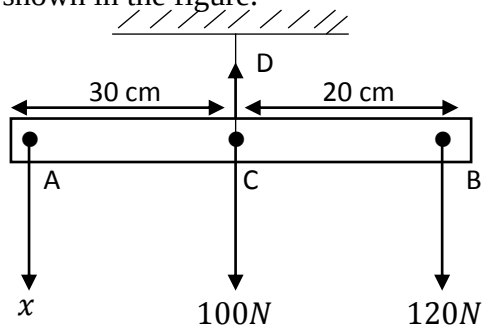


(i) Find the force on the object, when it is moving by the acceleration of $4ms^{-2}$, On the inclined plane. (2 marks)
(ii) Find the maximum velocity of the object. (2 marks)
(iii) Find the length of the inclined plane. (2 marks)
(iv) Find the total displacement of the object. (2 marks)
(v) Find the deceleration. (2 marks)

(B)
(i) What is the couple of force? (2 marks)
(ii) Write an expression for the moment of a couple of force. (1 marks)
(iii) Find the moment of the couple of forces. (1 marks)

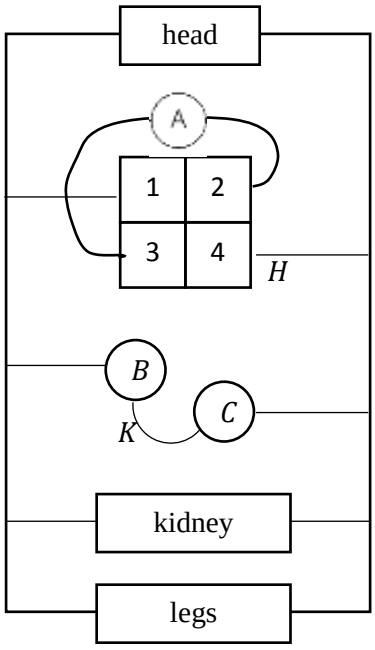


(iv) The rod AB is kept in equilibrium by suspending it at 'C' The three forces of x, 100N and 120N are applied as shown in the figure.



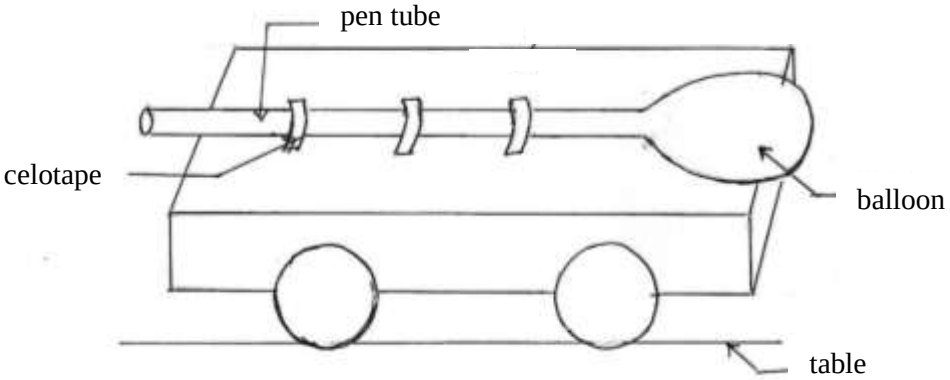
(a) Which two forces have no effect on the moment about point 'C'
(b) Find the value of 'x'
(c) Find the value if 'D'

(8) (A) Following is a diagram of a model of the human blood circulatory system.



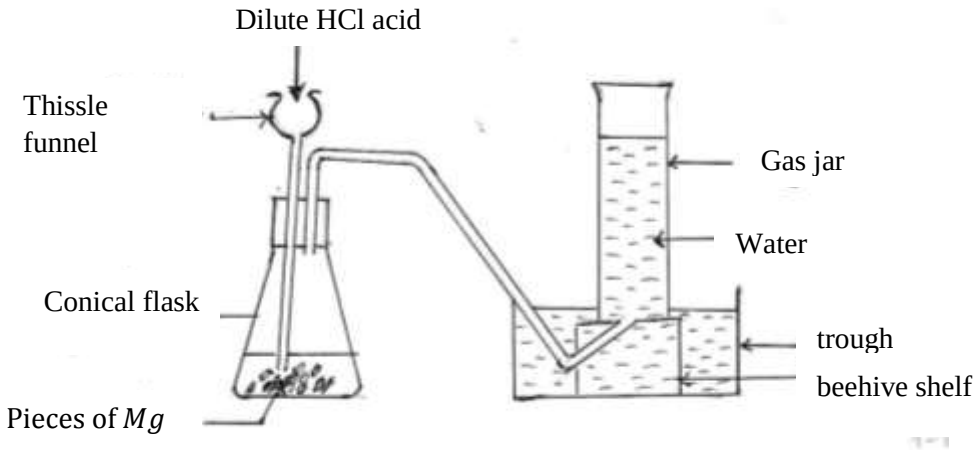
(i) Name the parts 1, 2, 3, 4 (2 marks)
(ii) 'K' is the hepatic portal vein. Name the organs 'B' and 'C' (2 marks)
(iii) Which compound is more concentrated in the blood contained in 'K' of a healthy person? (2 marks)
(iv) Does the blood in 'K' flow from C to B or B to C ? (1 mark)
(v) Name the organ 'A' (1 mark)
(vi) Write two substances that increase in concentration and decrease in concentration when blood flows through 'A' (2 marks)
(vii) What is double blood circulation? (1 mark)
(viii) Write two adaptations of 'C' for the absorption of simple foods. (2 marks)

(B) The following figure shows a toy cart made by a student. The cart moves forward when the balloon is inflated and the free end of the pen tube is opened.



(i) Write the action and reaction if the above cart moves on a smooth table. (2 marks)
(ii) (a) To which law of motion does this process apply? (1 marks)
(b) Write this law. (1 marks)
(iii) Find the amount of work done if a force of 3N in applied to the cart and it moves a distance of 500cm. (2 marks)
(iv) Write a way to slow down the trolley. (1 marks)

(9) (A) The following diagram set up a group of students to produce a gas in the laboratory .



(i) What is the gas that has been collected in the gas jar. (1 mark)

(ii) (a) How do you identify that gas. (1 mark)

(b) Write 2 uses of that gas. (2 marks)

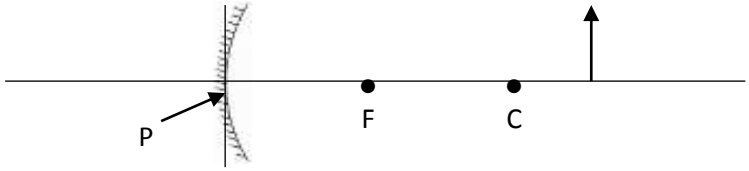
(iii) Write the balanced chemical equation for the reaction in the conical flask. (2 marks)

(iv) Write down a disadvantage if the tip of the Thistle funnel was above the liquid level. (1 mark)

(v) What gas would be produced if pieces of calcium carbonate were used instead of Mg in the set up? (1 marks)

(vi) Write 2 methods that can be followed to increase the speed of the reaction in (V). (2 marks)

(B) The following figure is prepared for drawing a ray diagram from a concave mirror.



(i) Name P , F , C (3 marks)

(ii) Complete the ray diagram and obtain the image. (2 marks)

(iii) Write 2 characteristics of the image. (2 marks)

(iv) A student used a hand lens to observe the stamens of a flower clearly.

(a) Draw a ray diagram to show how the stamens apper larger through the hand lens. (use vertical arrow $'\uparrow'$ for the object) (2 marks)

(b) Write 2 characteristics of the image. (1 marks)