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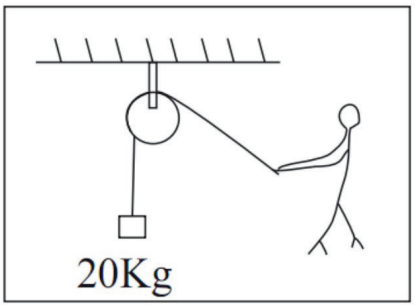
07. A person is applying force to hold a 20 kg mass using a pulley as shown in the figure. In this situation, if the 20 kg box is held stationary, the resultant force at that moment is,



1. 0N
2. 20N
3. 10N
4. 200N

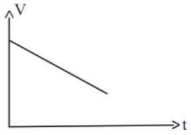
08. Important in absorption of vitamin B is,

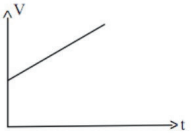
1. Iron
2. Calcium
3. Phosphorous
4. Iodine

09. A certain train moves with the speed of 20 ms^{-1} and gain acceleration of 2 ms^{-2} and the speed gain after 10s is,

1. 40 ms^{-1}
2. 60 ms^{-1}
3. 20 ms^{-1}
4. 30 ms^{-1}

10. The graph which shows how the velocity of an object changes with time when it is projected horizontally.

1. 

2. 

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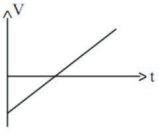
4. 

11. A method used to reduce friction opposing the motion of a motor vehicle is,

1. Increasing the number of tyres
2. Increasing the weight
3. Fixing a powerful engine
4. Renewing lubricating oil

12. Mass of a motor vehicle is 1000kg.If the limiting frictional force is 200N and the vehicle applies 700N, Find the acceleration that the vehicle acquires

1. 0.2 ms^{-2}
2. 0.5 ms^{-2}
3. 3.5 ms^{-2}
4. 5 ms^{-2}

13. Number of chromosomes in somatic cells of a certain animal is 20.Number of chromosomes travel to daughter cells in mitosis and meiosis respectively is,

1. 10 and 20
2. 20 and 10
3. 20 and 30
4. 10 and 40

14. Organelle that cannot be seen in cytoplasm is,

1. Ribosome
2. Golgi body
3. Chromosome
4. Nucleus

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15. Number of chromosomes in fertilized egg of human is,

1. 22 2. 23 3. 44 4. 46

16. Approximate number of hydrogen atoms in 0.1 g of hydrogen is,

1. 3×10^{22} 2. 6×10^{22} 3. 12×10^{22} 4. 6×10^{22}

17. Which has the more mass when considering the number of moles given below?(O =16, Na =23, Cl=35.5, H =1, S= 32)

1. Na 1 mol 2. NaCl 0.5 mol 3. H_2SO_4 0.6 mol 4. Na_2SO_4 0.8 mol

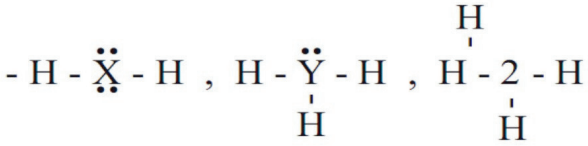
18. Main function in the cellular respiration is,

1. Convert glucose in to protein
2. Production of carbon dioxide
3. Production of energy
4. Degradation of protein

19. 0.5 mol of atoms of a certain metal called X is combined with 1 mol of certain non metal called Y. The formula of the compound formed in between X and Y can be

1. XY_2 2. XY 3. X_2Y 4. X_2Y_3

20. Lewis structures of hydrides of X ,Y,Z elements are given below. What could be X, Y and Z?

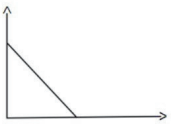
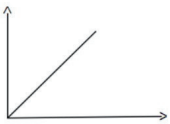
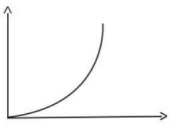


	X	Y	Z
1.	C	N	O
2.	O	N	C
3.	N	O	C
4.	C	O	N

21. Number of total atoms in a mole of CO_2 molecule is,

1. $6.022 \times 10^{23} \times 3$ 2. $6.022 \times 10^{23} \times 1$ 3. $6.022 \times 10^{23} \times 2$ 4. 6.022×10^{23}

22. Velocity–time graphs for a school van in four instances are given below. In which graph shows the instance where a balanced force acts on the vehicle?

1. 
2. 
3. 
4. 

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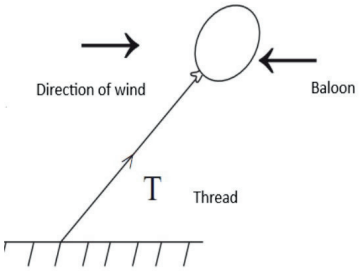
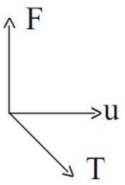
23. Which of the following ion pairs contain the same number of electrons as in the sodium ion?

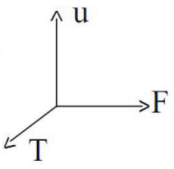
1. Mg^{2+} and Cl^{-} 2. Mg^{2+} and O^{-2} 3. Ca^{+2} and Cl^{-} 4. O^{-2} and Cl^{-}

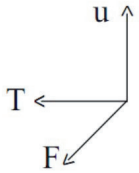
24.

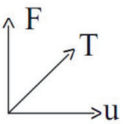


U is the upward thrust exerted by the air on a hydrogen balloon tied by a string when it is caught in the wind. The correct diagram showing the forces acting on the balloon is,

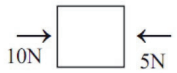
1. 

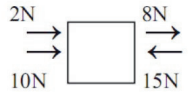
2. 

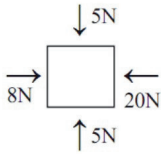
3. 

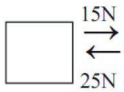
4. 

25. Given below are the four instances in which resultant force act on four objects. In which instance that the highest resultant forces is acted on?

1. 

2. 

3. 

4. 

26. Number of electron pairs in a double bond and a triple bond respectively when making covalent bonds are?

1. 4 , 6 2. 2, 3 3. 3, 4 4. 2, 4

27. A chemical compound that does not agree with the completion of octet is,

1. NaCl 2. MgO 3. MgO, NaCl 4. $AlCl_3$, PCl_5

28. Chemical formulae and the nature of the bond between element A with atomic number 12 and element B with atomic number 9 is,

1. AB_2 covalent 2. AB ionic 3. AB_2 ionic 4. AB_2 covalent

29. Which compound contains the highest percentage of nitrogen in molar mass of nitrogenous fertilizers listed below? (Atomic masses: N - 14, O - 16, S - 32, P - 30)

1. NH_4NO_3 2. $(NH_4)_2PO_4$ 3. KNO_3 4. $(NH_4)_2SO_4$

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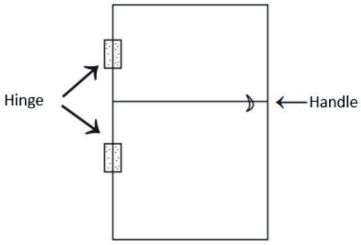
30. The elements used to make electrodes for electric cells, transistors, and skin lotions, respectively are:

1. C, Be, Si 2. C, Si, B 3. Ba, C, Si 4. C, B, Na

31.



The moment of force required to pull the door shown in the figure is 40 Nm. If the force applied is 50 N, what is the minimum distance from the axis of rotation (hinges) to the door knob (handle)?

1. 0.5 m 2. 0.8 m 3. 1 m 4. 1.25 m

32. A long spanner is more suitable for loosening a tight nut. What is the reason for this?

1.It increases friction 2. It reduces friction. 3.It provides a larger moment of force 4.It provides a smaller moment of force

33. Two people are carrying a wooden log with a mass of 150 kg. One person applies an upward vertical force of 500 N. What is the force applied by the second person?

1. 350 2. 650 3.1000 N 4.15000 N

34. A circus performer walking on a rope holds a long pole with both hands, keeping it balanced on either side of the rope. The purpose of doing this is:

1. To spread his weight to both sides along the pole.
2. To reduce the pressure exerted on the rope.
3. To raise the center of gravity.
4. To keep the center of gravity above the rope.

35. A hockey ball slides on a frozen lake with a uniform velocity. If friction on the ice and air resistance is negligible, the force required to maintain the motion of the ball is:

1. A force equal to the weight of the ball
2. The mass of ball × 9.8 ms^{-2}.
3. The weight of ball / the mass of ball.
4. 0

36. From the list below, the answer that contains only marine organisms is:

1. Coelenterata 2. Annelida 3. Arthropod 4.Echinodermata

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37. The non-essential factor for seed germination is:

1. Temperature 2. Oxygen 3. Light 4. Water

38. Fertilization occurs in a woman's body can be in,

1.Ovary 2.Uterus 3.Vagina 4.Fallopian tube

39. The testes are located externally in a sac-like structure called the scrotum. The advantage of the testes being located this way is:

1. That a large quantity of sperm can be produced and stored.
2. That sperm are produced more efficiently at temperatures lower than 36°C.
3. Being more protected than if the testes were located within the abdominal cavity.
4. To allow more time for sperm to travel through the urethra.

40. AIDS is a sexually transmitted disease that has reached epidemic status. Which of the following statements describe methods that can be used to prevent the spread of this disease?

A) Avoiding association with and touching patients.

B) Healthcare workers treating patients wearing rubber gloves always.

C) Being careful to prevent blood and other body fluids from a patient from directly entering the inside of a healthy person's body.

D) Not using the clothes of infected individuals.

1. B, C 2. A, D 3. B, D 4. C, D

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දෙවන වාර ඇගයීම - 2025
Second Term Evaluation - 2025
இரண்டாம் தவணைப் பரீட்சை - 2025

ශ්‍රේණිය Grade	10	විෂයය Subject	**Science - 11**	කාලය Time	**2 Hours**
නම **பெயர்** **Name**					

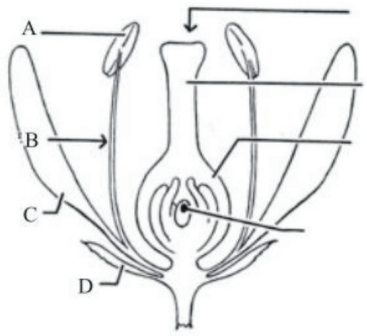
Instructions

- In Part A answer the 4 structured essay questions in the space provided.
- In Part B, answer 3 questions from the essay questions.

Part A

STRUCTURED ESSAY

01. **A**) The picture below shows a flower of a certain plant.



i) For which type of pollination that the given flower is adapted?..... (01 Mark)

ii) Name parts A,B,C and D. (02 Marks)

A …….. C……
B…….. D……

iii. Write the function of each parts. (01 Mark)

A…….

B……..

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iv Write another pollination type than that of above mentioned that can be seen in plant world.

…… (01 Mark)

(v) Write one adaptive feature of a flower for the pollination method you mentioned in part iv.

……..(01 Mark)

B) Elements belonging to the second period of the periodic table are given below out of order.

B	Li	C	Be	Ne	F	O	N

(i) Arrange the above elements in the order they appear in the periodic table.

..... (01 Mark)

(ii) a) Write the chemical formula of the compound formed in the reaction between Li and O.

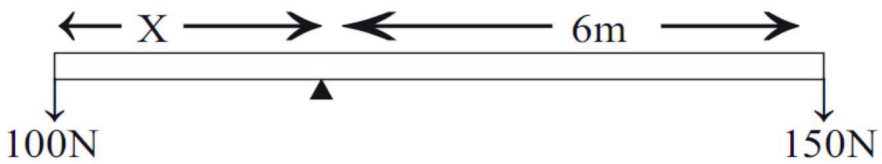
..... (01 Mark)

b) What is the type of chemical bond present in the compound formed (a) above?

..... (01 Mark)

(iii) Draw the Lewis structure for the CO_2 molecule, formed by the combination of one carbon atom and two oxygen atoms, in the provided box (2 Marks)

C) Forces are applied on a rod as shown below.



a) Find the clockwise moment.

..... (1 Mark)

b) What should be the length of X for the rod to be in horizontal equilibrium?

..... (1 Mark)

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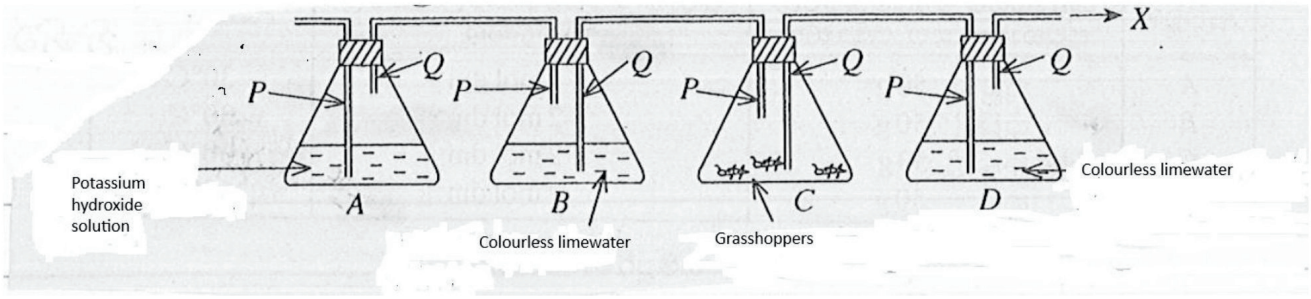
c) Write down 2 devices used in daily life that utilize a couple of force.
..... (1 Mark)

d) Write an advantage of a couple of force
..... (1 Mark)
(Total Marks: 15)

02. **(A)** An experimental setup prepared to show that living organisms release carbon dioxide during respiration is shown below.



(i) Name the apparatus that should be connected to the end X for this setup to operate.
..... (2 Marks)

(ii) Even if the apparatus mentioned in (i) above is connected, this setup will not function properly due to an error What is that error?
..... (3 Marks)

(iii) Write the purpose of using each of the following in a correctly assembled version of this setup.
a) Potassium hydroxide solution .....
b) Colorless limewater in flask B .....
c) Colorless limewater in flask D ..... (3 Marks)

(**B**) The following are some characteristics shown by invertebrate animals.

P	Has a shell made of calcium carbonate
Q	Has jointed legs
R	Has a body covering with sharp spines
T	Has a chitinous exoskeleton

(i) From the characteristics given above, write the letters corresponding to the characteristics shown by a grasshopper.
..... ……(2 Marks)

(ii) From the characteristics in the table above, write the letters corresponding to the characteristics **not** shown by the grasshopper, and name the invertebrate animal phylum that possesses those characteristics.
.....
.....
.....(3 Marks)

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(C) Below are electron micrographs of several organelles that can be seen inside a cell.



X



Y

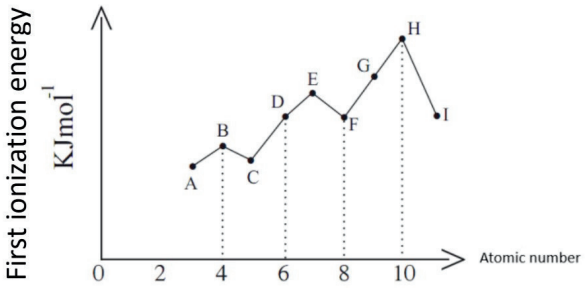


Z

Complete the table below based on the images above.

Organelle	Name of organelle	Main function
X Y Z		

03. (A) There are several trends that can be seen in the periodic table. The variation of the first ionization energy of elements with atomic numbers from 3 to 11 is shown below.



(i) Define "First ionization energy".

..... (2 Marks)

(ii) Write down the electron configuration of element H.

..... (1 Mark)

(iii) For element E, state the:

a) Period .....

b) Group ..... (2 Marks)

(iv) Among these elements, which element has the highest electronegativity?

..... (1 Mark)

(v) What is the allotropic form of element D that conducts electricity?

..... (1 Mark)

(vi) How the element I is stored?

..... (1 Mark)

(B) The molar mass of a compound named AB_2 is 44 $gmol^{-1}$.

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(i) What is meant by the term "molar mass"?

..... (2 Marks)

(ii) Calculate the mass of AB_2 in kilograms needed to obtain 150 moles of AB_2 molecules.

..... (1 Mark)

(iii) At room temperature, AB_2 is a colourless and odourless gas. It act as a coolant in solid form. AB_2 can be,

..... (1 Mark)

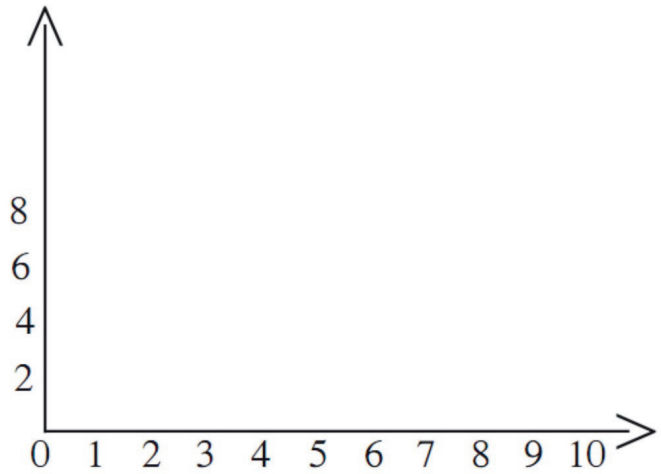
(iv) Write another use for this gas.

..... (2 Marks)

04. **(A)** A child rides a bicycle on a straight path. answer the questions related to the displacement-time graph using given data,.

Time (s)	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Displacement (m)	0	2	4	6	8	8	8	8	8	4	0

(i). Mark the points on the axis provided corresponding to the given data and draw the displacement-time graph.



(3 Marks)

(ii) What is the velocity of the bicycle during the first 4 seconds?

..... (2 Marks)

(iii) What type of motion is the child undergoing during the first 4 seconds?

..... (1 Mark)

(iv).State the single word for the rate of change of displacement.

..... (1 Mark)

(v) Find the rate of change of displacement according to the graph.

..... (1 Mark)

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(vi) What can you say about the motion of the child from 4 seconds to 8 seconds?
..... (1 Mark)

(vii) Find the velocity of the child during the last 2 seconds.
..... (1 Mark)

(B) Two forces of equal magnitude must be applied at a certain distance from each other to open the water tap.

(i) What is the name given for this pair of forces?
..... (3 Marks)

(ii) Write a suitable formula to calculate its value.
..... (2 Marks)

(iii) Indicate with arrows on the diagram how the forces act to open the tap. (1 Mark)



(C) A football player wore boots with nail-like structures attached.

(i) Write the advantage the player gets from wearing these boots.
..... (1 Mark)

(ii) When the player is standing still on the field, mark and show the forces acting on him on the diagram below. (1 Mark)



(Total Marks: 15)

Part B

05. **(A).** Reproduction is a biological process important for the continuity of plants. The processes related to plant reproduction are shown in the flowchart below.

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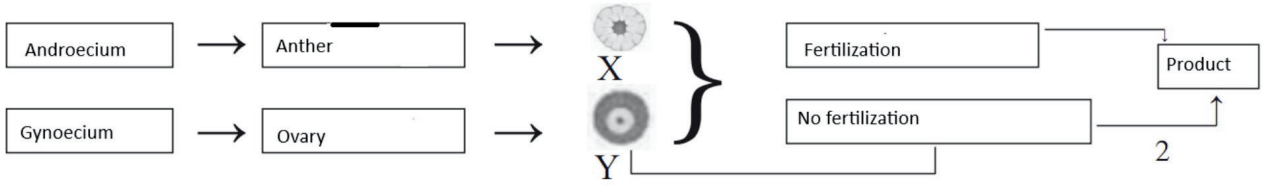


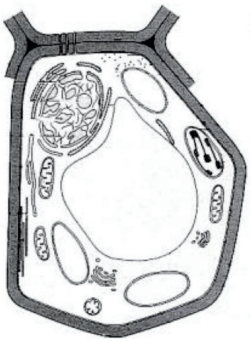
(i) Name the structures represented by X and Y. (1 Mark)

(ii) a) On which part of the gynoecium that the structure X is deposited? (1 Mark)
b) What is the name used for this deposition process? (1 Mark)

(iii) Simply define what fertilization is. (1 Mark)
iv) What part of the fruit does structure Y become after fertilization? (1 Mark)
(v) What is the name used for the process/part of the fruit indicated as 2? (1 Mark)

(B). A sweet orange plant and a wood apple plant have been grafted.
(i) Name the scion and the stock used here, respectively. (2 Marks)
(ii) Write one characteristic each that the scion and stock should have when selecting them for grafting. (2 Marks)
(iii) Write 2 materials required for plant grafting. (2 Marks)

(C)



A typical cell is shown in the figure.

(i) Is it a plant cell or an animal cell? (1 Mark)
(ii) What is a typical cell? (1 Mark)
(iii) Compare the differences between plant cells and animal cells. (2 Marks)
(iv) Write the function of each of the following organelles. (3 Marks)

(a) Nucleus
(b) Ribosome
(c) Mitochondrion
(d) Vacuole
(e) Golgi body
(f) Rough endoplasmic reticulum

v) What substances is the plasma membrane made of? (1 Mark)

(Total Marks: 20)

06. (A). A, B, C, D, E, F, G represent the atomic numbers of several different elements. These are English letters and not the standard symbols for the elements.

Element	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Atomic Number	3	6	10	11	12	13	17

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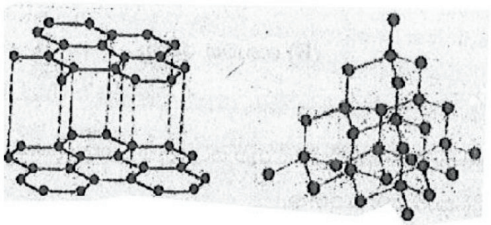
Answer using only the given symbols.

(i) Name the types of metallic elements present here. (2 Marks)
(ii) Name the types of elements belonging to the same group. (1 Mark)
(iii) Name the element that reacts vigorously with element A. (1 Mark)

(iv) Name the elements belonging to the second period. (2 Marks)
(v) Name the most reactive non-metal here. State the reason. (2 Marks)
(vi) What is the noble gas included here? Write reason for it? (2 Marks)
(vii) Which atom can become an ion with two positive charges among the atoms here? (1 Mark)

(B). Large atomic crystals are formed by strong covalent bonds.



X Y

(i) Identify X and Y. (1 Mark)
(ii) What is the reason for X being soft while Y is hard? (2 Marks)
(iii) Explain, with reference to its bonding nature, why X is used as a lubricant. (2 Marks)
(iv) State the reason why Y does not conduct electricity. (1 Mark)
(v) Write 2 uses of X. (2 Marks)
(vi) Water exists as a liquid at room temperature. Draw the Lewis dot and cross structure of water. (2 Marks)

(Total Marks: 20)

07. **(A)** A wooden block in the shape of a tall cuboid with a mass of 800g is placed on a table.

(i) a) Calculate the weight of this wooden block. (Gravitational acceleration= 10 ms^{-2}). (2 Marks)

b) The force exerted by the wooden block on the table top is equal to the weight of the wooden block. What is the magnitude of the reaction force exerted by the table top on the wooden block? (1 Mark)

c) State Newton's law of motion related to the phenomenon for which you obtained the answer in (b) above. (2 Marks)

(ii) As shown in Figure 1, to move the wooden block horizontally on the table, between points A

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and B, at which point is it more suitable to apply the force? State the reason.

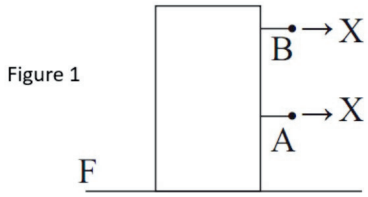
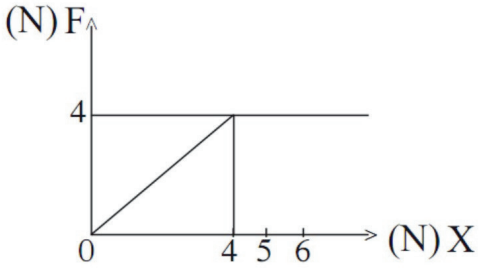


Figure 1

(2 Marks)

(iii) A newton balance was connected to the more suitable point between A and B, and a horizontal force named X was applied in increasing magnitude. The friction force F acting on the wooden block against the force X was plotted. The graph shown in the second figure was obtained.



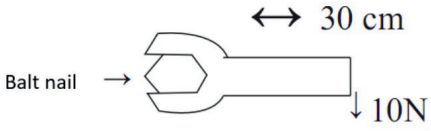
a) When the applied force X on the wooden block is 3N, what is the name for the friction force acting on it? (1 Mark)

b) According to the graph, what is the limiting friction force acting on the wooden block? (1 Mark)

(iv) It was necessary to drag a large wooden block along a flat, rough surface. Mention two different methods that can be used to reduce the friction between these surfaces. (2 Marks)

(v) The mass of the above-mentioned wooden block is 200Kg. When an unbalanced force of 100N is applied to it, find the acceleration of the wooden block in the direction of the force. (2 Marks)

(B) The figure below shows an instance of tightening a bolt using a spanner.



(i) a) Using the data shown in the figure, calculate the moment of the force applied on the handle of the spanner, in SI units. (2 Marks)

b) In the situation shown in the figure, in which direction does the nut rotate? (2 Marks)

(ii) Write a suitable method to increase the moment by applying the same 10N force to the spanner. (2 Marks)

(Total Marks: 20)

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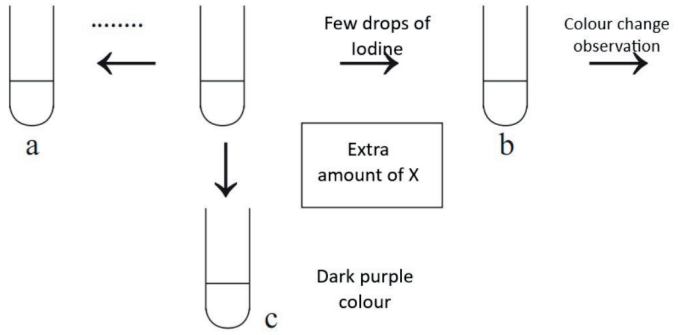
08. **(A)** A Group of students conducted an experiment to identify organic compounds in food by making aqueous mixture of food and placing 2ml in to test tubes as sown in the figure.



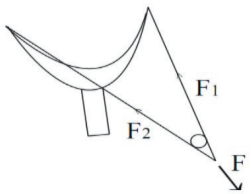
i. Name 4 organic compounds in living body (2 Marks)
ii. Write the inorganic substance that should be placed at x if the solution contains protein. (1 Mark)
iii. Write the observation if there is fat in the food (1 Mark)
iv. How is it identified if the food contains sucrose? (2 Marks)
v. In which vitamin deficiency causes beto patches in eye? (1 Mark)

(B). Unique properties of water plays a significant role in the existence of life.
i. What is the name given to the attraction force in between water molecule and another water molecule (1 Mark)
ii. Write how the solvent property of water contributes to the survival of fish (1 Mark)

(C) . A rough figure of a catapult used to throw a small stone is given below.

i. When the stone is held in equilibrium under a force F by rubber band in which equilibrium is in F_1, F_2 and F_3 (1 Mark)

ii. Write 2 factors needed for an object under three forces to be in equilibrium.



(2 Marks)

iii. Write an example of object being in equilibrium under three parallel forces (2 Marks)

(D). A child with the mass of 50 kg slides in a horizontal surface at a constant speed of 0.5 ms^{-1} applying an unbalanced force of 500N.

i. Write the first law of Newton. (2 Marks)
ii. Write the reason why the child happen to apply 500N force to continue a constant velocity (2 Marks)
iii. Write a change that the child can make to reduce that force (2 Marks)

(total marks 20)

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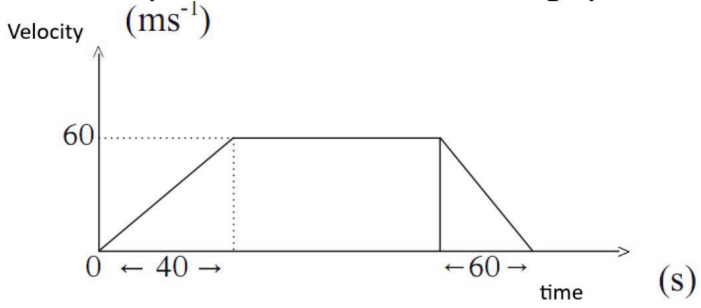
09. **(A)** Velocity - time graph related to the motion of an ambulance from base hospital to national hospital is shown below. Use the graph to answer the following question



a) What was the uniform velocity of the ambulance? (1 Mark)

b) If the displacement of the ambulance at uniform velocity was 15km (1500m), find the time it traveled at that uniform velocity. (2 Marks)

c) Find the distance between the two hospitals. (2 Marks)

d) The surgery had to be started within 30 minutes from the moment the patient was transferred from the initial hospital. If the doctors and all other arrangements were ready, would they be able to start the surgery on time? Explain your answer. (2 Marks)

(B) The force opposing the motion of a moving object is 10N.

(i) The mass of the object is 2Kg. Find the resulting acceleration when a force of 16N is applied to the object. (1 Mark)

(ii) What is meant by momentum? (1 Mark)

(iii) What are the factors that affect momentum? (1 Mark)

(iv) Find the momentum of a 10Kg object at the moment it is moving with a velocity of $4ms^{-1}$. (2 Marks)

(C) In daily life, we have to apply force to perform various tasks.

(i) Name the scientist who introduced the concept of force. (1 Mark)

(ii) Classify the following quantities as scalars and vectors. (2 Marks)
(speed, velocity, displacement, acceleration, magnetic field)

(iii) In some farms, a rotating jet water sprinkler is used to water the crops. On which of Newton's laws does this operate? (1 Mark)

(iv) Mention 2 factors that affect friction. (2 Marks)

(v) Write one instance each where it is necessary to reduce friction and to increase friction. (2 Marks)

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