Ministry of Education
Science Branch

Grade 11 | **Supportive Test - 2023** | **34 S II**

Science I | **3 hours**

Instructions :

- ❖ Answer all questions.
- ❖ Four choices 1,2,3 and 4 are given for the questions 1 to 40 . Select the correct or most appropriate choice for each
- ❖ Mark a cross (X) on the number corresponding to your choice in the answer sheet provided.
- ❖ question.

1. Which answer contains the elements always present in proteins?
   (1) C , H, O, and N (2) C, H, O, and S (3) C, H, N, and S (4) C, O, N, and S

2. In chemistry, the unit g mol^{-1} is used to measure,
   (1) the molar mass. (2) the mass of a mole of the matter
   (3) relative atomic mass. (4) atomic mass unit.

3. What is the commercial unit of measuring electric energy by the domestic electric meter?
   (1) J (2) kJ. (3) W (4) kWh

4. An inherited disease related to sex linked gene mutation,
   (1) Albinism. (2) Anemia.
   (3) Colour blindness. (4) diabetes.

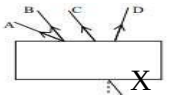
5. Which of the following separation techniques can be used to produce distilled water?
   (1) Solvent extraction (2) Steam distillation. (3) Simple distillation. (4) Fractional distillation.

6. An instrument which made by applying the principle of electromagnetic induction is,
   (1) electric motor (2) electric crane
   (3) microphone (4) loud speaker

7. A type of blood corpuscles which can be commonly seen in a blood sample when observed under the microscope is given in the diagram below.
   The above type of corpuscle can be,
   (1) platelets. (2) white blood corpuscles.
   (3) red blood corpuscles. (4) granulocytes.

8. The Metal that can extracts by electrolyzing fused compound
   (1) Mg (2) Fe (3) Sn (4) Au

9. One colour light ray which incidents on a face of a cuboid shaped glass block is shown below. What can be the correct ray of light that emerges from the opposite face of the glass block?
   (1)A (2) B (3) C (4) D



10. The main function of the nucleus of a cell is,
    (1) production of secretory substances. (2) maintenance of support of the cell.
    (3) control of life activities of the cell. (4) transport of material within the cell.

11. The atomic number of Na is 11. Its mass number is 23. The correct order of number of protons, neutrons and electrons present in Na^+ can be,
    (1) 11, 12 and 10 . (2) 11, 12 and 11 . (3) 11, 11 and 12 . (4) 12, 12 and 23 .

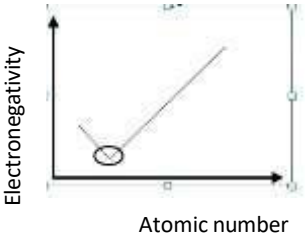
12. The method of identification of the gas produced during the photosynthesis is,
    (1) gives 'pop' sound when introduced a glowing splinter (2) flame of the splint immediately extinguishes.
    (3) turns colourless lime water into milky colour. (4) glowing splint relights

13. Several energy transformations are given below. Select the correct energy transformation among them.

(1) Dynamo - kinetic energy ⟹ potential energy
(2) electric motor - electric energy ⟹ kinetic energy
(3) dry cell - electric energy ⟹ chemical energy
(4) solar cell - solar energy ⟹ potential energy

14. A part of the graphical representation of the variation of electronegativity for two elements is given below. The two elements that present in the area which rounded by the circle should be,

(1) Na or Mg (2) F or Cl (3) Na or K (4) He or Ne



15. Select the **false** statement out of the statements given below.

(1) Heat energy from the sun reaches the earth by the radiation
(2) Any type of heat transfer does not take place through a vacuum.
(3) Black surfaces are rich heat absorbers.
(4) Shiney surfaces reflect heat well.

16. The answer which gives a similarity and dissimilarity between cardiac muscle tissue and skeletal muscle tissue respectively is,

(1) with nuclei and without nuclei (2) with cross striations and without cross striations
(3) with cross striations and involuntary action (4) uninucleate cells and branched cells

17. A chemical equation related to the production of Oxygen gas is given below.

$$2H_2O_2\,(l) \longrightarrow 2H_2O(l) + O_2(g)$$

To which types of chemical reactions, the above equation belongs to?

(1) Chemical combination (2) Chemical decomposition (3) Single displacement (4) Double displacement

18. Select the answer with the correct order of three organizational levels in the Biosphere.

(1)Individual, Community , Ecosystem (2) Population, Community, Ecosystem
(3) Population, Ecosystem , Biosphere (4) Individual, Population, Ecosystem

19. Select the statement which shows the correct relationship between the change of the frequency, velocity and wave length of a sound wave which travels from water to air.

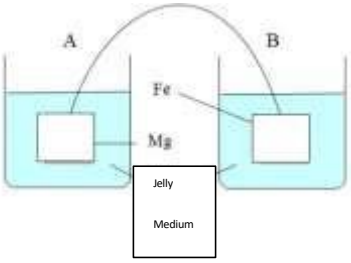
	frequency	velocity	wave length
(1)	changes	changes	changes
(2)	changes	changes	does not change
(3)	changes	does not change	changes
(4)	does not change	changes	changes

20. Select the answer which consist of tissues with only living cells and only non-living cells respectively.

(1) Parenchyma tissue and phloem tissue (2) Collenchyma tissue and xylem tissue
(3) Parenchyma tissue and sclerenchyma tissue (4) Xylem tissue and parenchyma tissue

21. Potassium ferricyanide and Phenolphthalein solutions are mixed with Agar jelly is added to two small beakers in equal amounts. Pieces of Mg and Fe are dipped in the agar jelly medium in those beakers and they are in contact with a conductor as shown in the diagram. What are the colour changes that can be observed in the jelly medium after few hours?

	A	B
(1)	blue colour	pink colour
(2)	blue colour	colourless
(3)	Colourless	pink colour
(4)	Colourless	blue colour



22. Four statements regarding the change of the resistance of a straight conductor are given below .

A. Resistance increases with the length.
B. Resistance decreases when the temperature increases.
C. Resistance changes according to the material of the conductor.

The true statement / statements out of the statements given above?

(1)A . (2) B . (3)A and C . (4) B and C .

23 What is the correct statement about the solubility?

(1) Temperature does not affect the solubility of a gas in water.
(2) Temperature and pressure effect on the solubility of a solid in water.
(3) The maximum mass of solute which can be dissolved in 100 g water at a certain temperature
4) The maximum amount of a solute which can be dissolved in 100 g of water increases gradually with the decreasing temperature

24 Three statements expressed by a student about the two equilibrium forces which acting an object as shown by the diagram are given below.

A. The object is on rest
B. The object moves at a uniform velocity.
C. The object accelerates.

Correct sentence among the above are,

(1) A and B (2) A and C (3) B and C (4) A, B and C

25 Sun energy flows to a one direction in a food chain. Only 10% of the energy in a certain trophic level passes to the next trophic level. Consider the following food chain

Grass → Cow ⟶ Tiger

If the energy stored in grass is 2500J in this food chain, what will be the energy stored in the tiger ?

(1) 1 J (2) 2.5 J (3) 25 J (4) 250 J

26 In which instance given below exothermic reaction takes place?

(1) Photosynthesis. (2) Respiration.
(3) Combustion of lime stone. (4) Heating of condis.

27 5 N and 10 N colinear forces are acting on an object. The resultant forces of these two forces can be,

(1) 15N or 5 N (2) 4 N or15 N (3) 8 N or 12 N (4) 10 N or 5 N

28 The answer with the correct order of functions of the Hydrochloric acid and Renin contain in gastric juice.

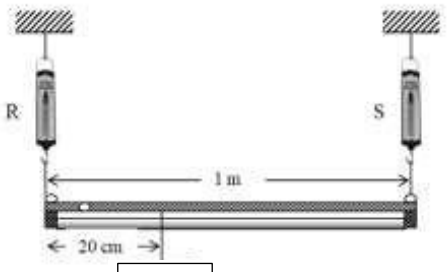
	Hydrochloric Acid	Renin
(1)	emulsification of lipids	activation of pepsin
(2)	coagulation of milk,	activation of pepsin
(3)	activation of pepsin	coagulation of milk,
(4)	emulsification of lipids	coagulation of milk,

29 . A bullet of mass 50 g is fired by a gun moves at a velocity of 2000 m s^{-1}. Find the momentum of the bullet.

(1) 100 kg m s^{-1} (2) 1000 kg m s^{-1} (3) 3500 kg m s^{-1} (4) 100000 kg m s^{-1}

30 A weight of 15 N is suspended on a light rod which is hung by two spring balances, R and S. The readings of R and S spring balances are,

	Reading of R	Reading of S
(1)	5 N	10 N
(2)	10 N	5 N
(3)	3 N	12 N
(4)	12 N	3 N



31 The condition that affect the blood supply to a certain organ due to a blood clot in a blood vessel is called,

(1) Hypertension. (2) Thrombosis. (3) Atherosclerosis. (4) Angina.

32 Four sexually transmitted diseases are given below.

A. Herpes B. Ghonoria C. Syphilis D. AIDS

Out of above diseases which cause by bacteria only,

(1)A and B only (2) A and C only (3) B and C only (4) B, And D only

33 420 J amount of heat is supplied to 100 g of water. Find the level of temperature increased in water. (Specific heat capacity of water is 4200 $\mathbf{J\ kg^{-1}\ ^0C^{-1}}$)

(1) 1 ^{0}C (2) 2 ^{0}C. (3) 10 ^{0}C (4) 12 ^{0}C

34 Three methods of identification of gasses in the laboratory are given below.

A- Introducing a glowing splinter into the gas sample.

B- Introducing a flame into the gas sample .

C- Bubbling the gas through lime water.

The methods of identification of Hydrogen and Oxygen gases from the above can be respectively,

(1) A and B only. (2) A and C only. (3) B and A only. (4) B and C only.

35 Tin metal is coated on the inner surface of a fish can. Three statements regarding this action are given below.

A- It protects the metal by which the can is made from rusting.

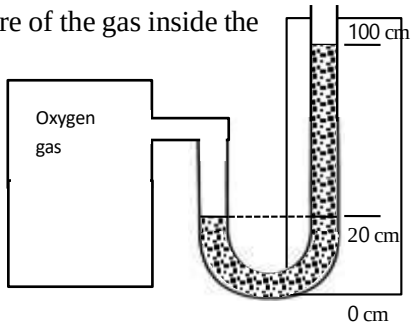
B- It prevents the reaction between the container and the contents.

C- The fish can corrode quickly when release to the environment after the usage

The most correct answer regarding the coating of tin in the can could be,

(1) A and B only. (2) A and C only. (3) Band C only. (4) All A, B and C

36 A barometer fixed to an Oxygen tank is given below. What is the pressure of the gas inside the tank? (Consider atmospheric pressure as P_o and the density of mercury as ρ)



(1) $P_o + \frac{(100-20)\ m}{100} \times \rho \times 10$ (2) $P_o - \frac{(100-20)\ m}{100} \times \rho \times 10$

(3) $(P_o + \frac{(100-0)m}{100} \times \rho \times 10$ (4) $P_o - \frac{(100-0)m}{100} \times \rho \times 10$

37 Select the ***incorrect*** statement about the anerobic respiration.

(1) The anerobic respiration that takes place in animals is known as lactic acid fermentation.

(2) The respiration that takes place without oxygen is known as anaerobic respiration.

(3) Cramps occur when anaerobic respiration takes place in animal bodies.

(4) Ethyl alcohol is produced during the anaerobic respiration in animal bodies.

38 The correct order of descending in the pH values of Acetic acid (CH_3COOH), Hydrochloric acid (HCl), Calcium Hydroxide solution($Ca(OH)_2$) and Distilled water(H_2O) is,

(1) $Ca(OH)_2$, H_2O, CH_3COOH, and HCl (2) H_2O, CH_3COOH, HCl, and $Ca(OH)_2$

(3) $Ca(OH)_2$, CH_3COOH, HCl and H_2O (4) HCl, CH_3COOH, H_2O, and $Ca(OH)_2$

39 A student decides to measure the temperature of a heap of sand. What should not do by the student?

(1) The reading must be taken while the thermometer is still there in the heap of sand.

(2) The reading mut be taken quickly after the bulb of the thermometer immersed in sand.

(3) The thermometer must immerse vertically in the heap of sand to get the reading.

(4) The meniscus of the mercury column of the thermometer must be kept at eye level when getting the reading.

40 The action that should be paid more attention to spend a healthy life.

(1) Consuming food with less amount of artificial flavoring agents.

(2) Avoiding the consumption of instant food and fast food when drinking tea.

(3) Adding considerable number of vegetables and fruits to the meals.

(4) Drinking purified bottled water

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Grade 11 | **Supportive Test - 2023** | **34 S II**

Science II | **3 hours**

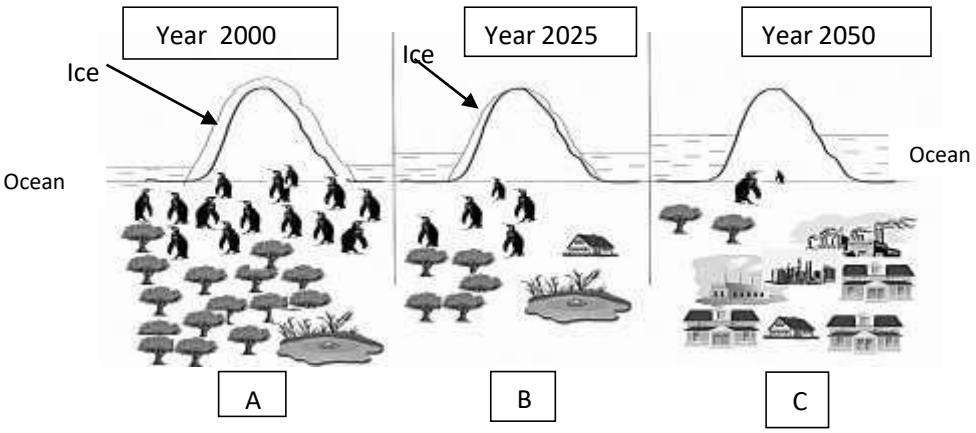
Instructions:-

- **Write your answers in clear handwriting.**
- Answer the four questions in **part A,** in the space provided.
- Of the five questions in **part B** answer three questions only.
- **After answering, attach Part A and the answer script of Part B and handover together.**

Part A- Structured Essay

1. The influence of human activities on the environment of a polar region is shown by the forecasting diagram given below.

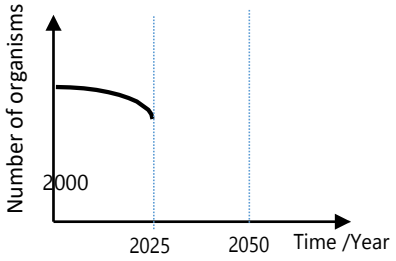
(A)



i. Mention the environmental issue that affected the rising of the water level of oceans in the year 2050 ?
……(1)

ii. Name two gases that cause the environmental issues which responsible for the rise in the water level in the ocean as indicated in part C of the forecasting diagram.
…… (2)

iii. The following curve represents the variations in the number of organisms in the penguin population between the time period year 2000 to 2025 according to the above forecasting diagram.



a. According to the graph, mention two human activities affect for the variation. (02)
……
……

b. Complete the remaining part of the graph relevant to the time period from year 2025 to 2050. (02)

(B) A student states that poor management of materials and energy and not using other energies sustainably are thereasons for the unfavorable environment changes.

i What is meant by Sustainable development?
…… (2)

ii. Complete the table relevant to the 4R practices in waste management. (03)

Instance	4R Principle
Using empty plastic water bottles to put honey	Reuse
Taking antibiotics without medical advice	(a) …….
(b) …….	Replace (using Substitution)
Production of biogas using animal waste matter	(c) …….

.

iii. Mention two suitable power stations that can be operated by using natural energy resources currently present in Sri Lanka apart from Hydro power stations

……..(02)

iv. Write a factor that should be considered to minimize the energy crisis when planning houses.

…….(01)

2. (A) Carbohydrates, proteins, lipids, and nucleic acids are considered as main biomolecules in living matter.

i. What is the element present in protein but absent in carbohydrates and lipids?

…….(01)

ii. Mention two biomolecules which important as an energy source in living bodies.

…… (02)

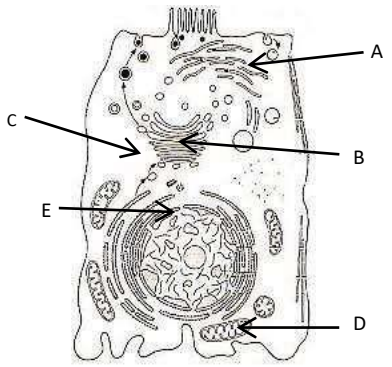
iii. Which element deficiency causes yellow or purple patches on plant leaves?

…… (01)

iv. Write one deficiency syndrome that occurs due to the deficiency of Vitamin K in human bodies.

…….(01)

(B) A typical animal cell created using electron microscopic information is shown below.



i. Name parts A and B

A …….

B.....(01)

ii. What is the letter used to indicate the organelle that divides first during the cell division process?

…….(01)

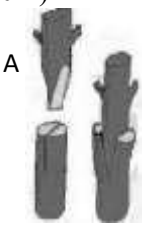
iii. Write the function of the organelle indicated by the letter D

…….(01)

iv. Mention an organelle which cannot be seen above cell but can see the plant cells

…….(01`)

(C) Reproduction contributes to the continuity of life.

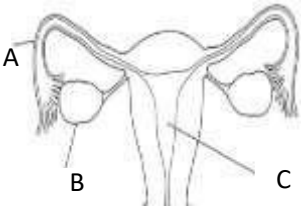


i. The following diagram shows an instance related to the grafting of plants. A is known as …… while B is known as …….. This method of grafting is known as …… (2)

ii. A part of the female reproductive system is given below. Write the **letters** relevant to the places where implantation and fertilization take place.

a. Fertilization .....(1)

b. Implantation .....(1)



v. Mention a stage of the menstrual cycle where a change in ovaries occurred and the hormone secrets from ovaries at that stage.

a. Phase ..... (01)

b. Hormones .....(01)

3. (A) A diagram of a setup of an activity conducted by a group of students in the school laboratory is shown below. Equal masses of magnesium are used in A, B, and C test tubes and the experiment is conducted to obtain the conditions given in the table 1.

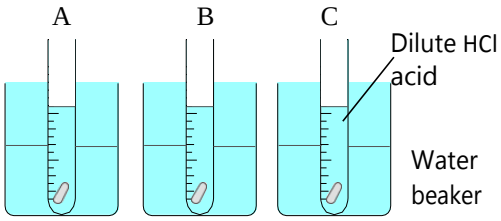


Table 1

	Tube A	Tube B	Tube C
HCl	0.5 ml	5 ml	5 ml
Water	9.5 ml	5 ml	5 ml
Temperature	30^0C	30^0C	10^0C

i. In which test tube, the chemical reaction with the highest rate of reaction takes place?

…….. (1)

ii. To identify the factors affecting the rate of a reaction, the experiment should be done by keeping the relevant factor under controlled. Fill in the blanks in the table by using the above given data.

Pair of test Tube	The factors affecting the rate of reaction
A and B	(a).....
(b).....	Temperature

iii. (02)

a. Write the balanced chemical equation for the reaction between HCl and Mg

…… (2)

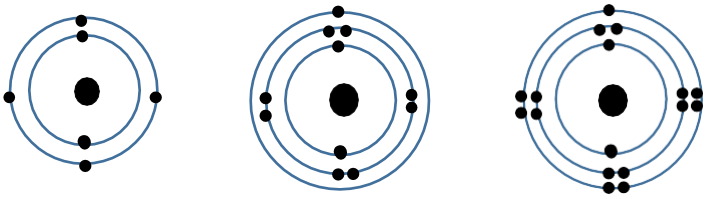
b. Is it possible to use a piece of Cu instead of the piece of Mg in this experiment under the given conditions?

……(01)

c. Give the reason for the answers you mentioned in the above question b

…… .(1)

(B) Three atoms of certain elements are denoted by P, Q, and R. (The given letters are not standard symbols)



P Q R

i.

a. Identify and name the element Q

……(1)

b. Write the electron configuration of P

……(1)

c. Which element has the highest electron negativity among P, Q, and R

……(1)

ii. Bonds are formed in between atoms to complete the octet of electrons in the valence shell.

a. Write the formula of the compound formed by the reaction between P and R.

…… (1)

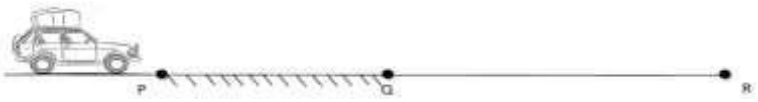
b. Mention the types of the bonds formed between P and R and Q and R.

I. P and R ……

II. Q and R..... (2)

c. Diagrammatically represent the formation of the bonds between Q and R (2)

4. (A) A motor car travels on a horizontal straight way is shown by the diagram given below. The frictional force exerts on the tiers of the vehicle is higher in P Q area than that of the Q R area. The frictional force act on the vehicle is 300N when it travels from P to Q.



i. The engine gives a continuous force of 300 N when the motor car moves from P to R. Complete the table according to the situation. (04)

	Type of the motion	Reason for the type of motion
When travels from P to Q	Uniform velocity	(a)……..
When travels from Q to R	(b)…….	(c)……..

(4)

ii. What is the name given for the type of frictional force which applies on the motor car by the road?(01)

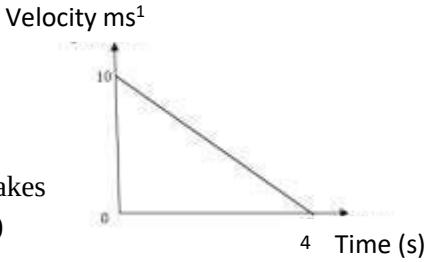
……

iii. Name one advantage and one disadvantage that the moving motor car receives by the frictional force whichapplies on the vehicle by the road.

Advantage .....(01)

Disadvantage.....(01)

iv. The velocity time graph of the motion of the motor car after applying brakes



a. Find the deceleration of the motor car according to the graph (01)

…… (01)

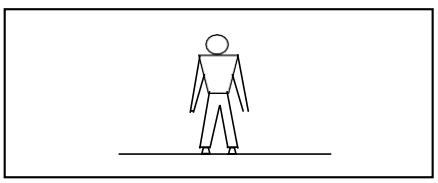
b. Find the distance travelled at a deceleration. (02)

……

v. The passengers standing on a moving bus without holding anything for support push forward when the bus suddenly stops by applying brakes. Which law of Newton can be applied to describe the situation?

…… (01)

B. A man of 80 kg mass is standing on a lift. (02)



i. Mark the forces act on the man when he is standing on the lift.(02)

ii. Write the forces react by the floor of the leverage during the given instances.

a. When the lift is still without moving)

……

……(01)

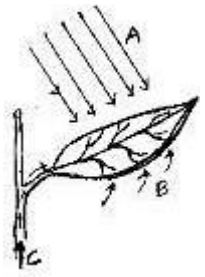
b. When the lift moves upward at a 0.5 m s $^{-2}$ acceleration.

……

……(02)

Science II – Part B

5. (A) The following diagram represents one of the metabolic processes that take place in organisms.



(i) Define "Photosynthesis" (01)

(ii) Write material and non-material substances that contribute to the, photosynthesis from A, B, and C separately. (02)

(iii) Name the chemical reagent that can be used to identify the storage material produced by the photosynthesis. (01)

(iv) The material that is produced in the plant leaf by the photosynthesis is transported through the phloem tissue to the other parts of the plant later.

a. As what compound, the material produced by the above process does transport through the phloem tissue? (01)

b. To which type of plant tissues, phloem tissue belongs under the classification of plant tissues? (01)

(v) Briefly describe the contribution of photosynthesis to maintain the carbon cycle by pointing two factors . (02)

(B) When plants with blue colour flowers are crossed with plants with white colour flowers, all plants in the F_1 generation were a blue colour flower plants.

(i) Name the dominant feature and recessive feature used for the above cross. (02)

(ii) Write the genotype of the mother plants by using capital and simple letters of a suitable English letter to represent the colours of the flowers. (02)

(iii) A plant with recessive feature is crossed with a plant with a heterozygous genotype. Write the phenotype and genotype of the F_1 generation. (02)

(iv) A flower planter needs plants which bear only blue flowers only. Briefly describe with the help of Mendel's theory, the process which you follow to give suitable seeds to him. (02)

(C) Different types of hormones are produced by the endocrine glands.

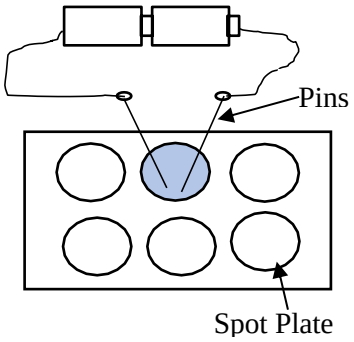
(i) Name the gland which produces the Calcitonin hormone. (01)

(ii) Which hormone prepares our body for an emergency situation? (01)

(iii) Diabetes patients take insulin hormone as a vaccine. What is the function done by insulin? (02)

(A) Attention is being paid to plan laboratory experiments using less amount of chemicals to minimize harmfulenvironmental issues.

i. The below diagram shows a setup prepared to demonstrate the process of electrolysis. Two drops of Copper Sulphate solution are put onto a spot plate.



a. Write two observations that can be observed when the two pins are inserted into the Copper Sulphate solution. (02)

b. A Student mentioned that the usage of two graphite pencil rods instead of pins, is more suitable for this experiment. Give a reason for his idea. (01)

ii. The group of students used the spot plate to identify acids and bases. A B and C are colourless solutions used for this activity. The following table gives the observations of the activity.

	Solution A	Solution B	Solution C
Litmus	Red litmus turns into blue	Blue Litmus turns into red	Blue Litmus turns into red
pH papers	Purple	Red	Yellow

a. What among A, B, and C solutions, are strong base and weak acid? (02)

b. Mention the reason for the difference in strong acids and weak acids according to the method of ionization of ions in the aqueous solutions. (02)

c. The following observations were resulted when X, Y and Z metals were added to the aqueous solution of the strong acid.

X -Gas Bubbles evolved slowly

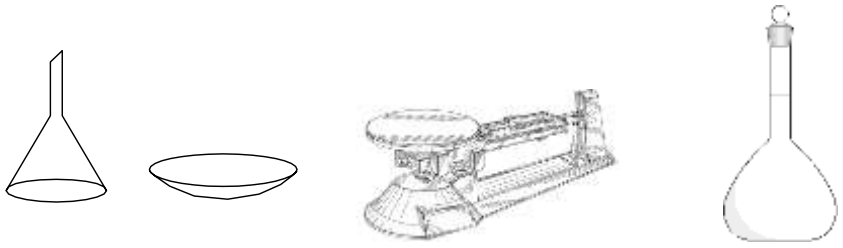
Y-No gas Bubbles evolved.

Z- Gas Bubbles evolved rapidly.

i. Arrange element X, Y and Z according to the descending order of their reactivity. (1)

ii. Which pair of metals displaces Copper when added to a dilute copper sulphate solution? (1)

(B) Following diagrams show some instruments used to prepare a standard solution by using Copper Sulphate. (Cu = 64, S = 32, O = 16)



i. P Q R S

a. Name the instruments P, Q R and S. (2)

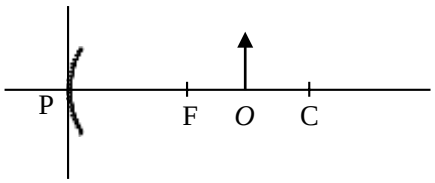
b. What is the mass of a one Mole of Copper Sulphate? (2)

c. What is the mass of Copper Sulfate ($CuSO_4$) required to prepare the 0.1 moles of $CuSO_4$ solution? (1)

d. Write the steps of preparing 250 cm^3 of standard $CuSO_4$ solution by using the correct mass of $CuSO_4$ (4)

ii. The mixture is prepared by dissolving 10 g of CuSO4 in 90 g of water. Write the composition of the mixture as a mass fraction (2)

7. (A) Following diagram shows the position of the object indicated as " ***O*"** in front of a concave mirror.

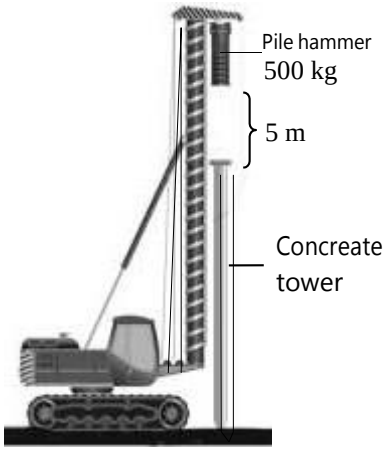


(i) Copy the diagram to the answers script and draw the ray diagram of the image formed by the object. (03)

(ii) Mention two features of the image formed. (02)

(iii) Mention one usage of concave mirrors in our day-to-day life. (01)

(B) Following diagram shows a concrete tower fixed into the ground by a pile driver. The mass of the pile hammer is 500 kg. This mass always lifts to 5m height from the concrete tower and drops onto it. (g = 10 m s^{-2})



i) Find the mass of the pile hammer. (02)

ii) Calculate the energy stored in the pile hammer after it lifts 5m above fro concrete tower. (02)

iii) Write which type of energies increased and decreased from potential and kinetic energies, when moving Pile hammer from up to down and down to up respectively. (02)

iv)iv)

a) Write a formula to express the velocity of the pile hammer when it strikes on the concrete tower. (01)

b) Calculate the velocity of the pile hammer when it strikes the concrete tower. (02)

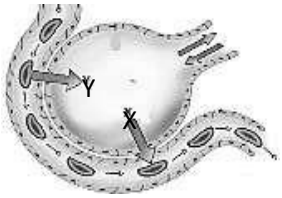
v) An electric motor with 230 V is used to lift the pile hammer. The time taken to lift the pile hammer top to 5 mheight is 4 seconds.

a) What is the work done when the pile hammer is lifting? (02)

b) Find the power of the motor. (01)

c) Calculate the current flows through the motor when it works. (02)

8. (A) Gas exchange takes place in alveoli during the process of external respiration of human beings. Gas exchange takes place in alveoli and it is shown in the diagram given below.



(i) Name the two gases indicated as X and Y in the diagram. (01)

(ii) Name the process by which the exchange of gases takes place in alveoli. (01)

(iii) Mention two adaptations of the respiratory surfaces for efficient gas exchange. (02)

(B) The atria and Ventricles of the heart contract to pump blood out of the heart.

(i) What is known as heartbeat? (01)

(ii) Name a valve which closes during systole. (01)

(iii) An Electro cardiogram of a healthy person is given in the diagram. What is the stage indicated by the letter T ? (01)

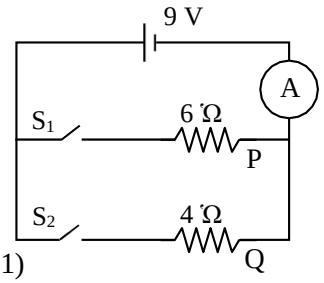
(C) Removal of excretory products produced during metabolism from the body is called excretion. The main organthat carries out nitrogenous excretion in the human body is the kidney

(i) What is the structural and functional unit of the kidney? (01)

(ii) Name one nitrogenous excretory matter which gets filtered from the blood. (01)

(iii) Why fecal matter is not considered as an excretory substance? (01)

(D) A diagram of an electric circuit is given below. 9V potential difference is supplied to the circuit by the electric source.



i. According to what method the resistors are fixed to the circuit? (01)

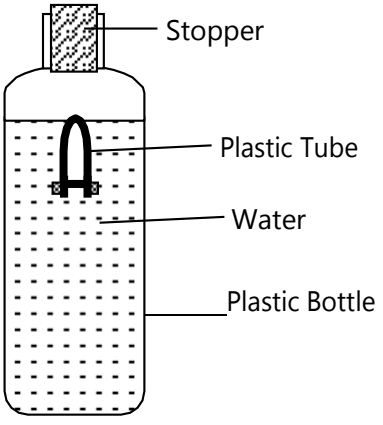
ii. What is the force by which the negative terminal of the electric source releases electrons to the external circuit? (02)

iii. What is the reading of the ammeter when S_1 switch is closed?

iv. What is the amount of heat energy emitted by Q when only the S_2 switch is closed? (01)

v. What happens to the reading of the ammeter when both S_1 and S_2 switches are closed? Will it increase or decrease the value of the answer for the above question (ii)? (01)

D) The diagram below shows one side close-ended plastic tube which is connected to a weight and immersed in water.



i. What is the name of the upward force given by water which applied to the plastic tube? (01)

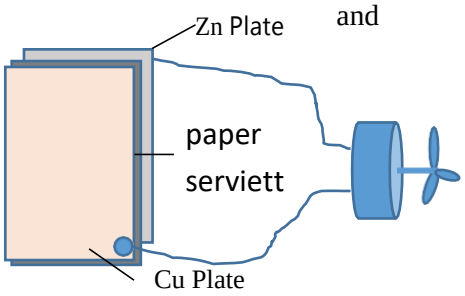
ii. The plastic tube moved downwards when the bottle was pressed by hand.

a. What the change happens in the volume of air inside the bottle when the bottle is pressed by hand? (01)

b. A certain volume of water is displaced when the plastic tube is still and immersed in water. Will this volume of displaced water be higher or lower than the volume of water displaced when the bottle was pressed? (01)

c. Mention the reason for the downward movement of the plastic tube. (02)

9. (A) In a school exhibition (Cu) plate and Zn plate, paper serviettes, lime juice, and conducting wires were used to rotate a motor.



i. In which direction do electrons flow through the plates in the circuit when the motor rotates? (01)

ii. What acts as the cathode from the Copper and Zinc plate? (01)

iii. Write the half reaction that takes place on the Zinc Plate. (01)

iv. Metal atoms convert to ions during the corrosion.

a. Which metal from Copper and Zn can be used to protect iron from rusting? (01)

b. Give an example for an instance where iron can be protected from rusting by using the above method. (01)

(B) Polymers are used for different purposes.

i. Name an instance of usage of each polymer given below.

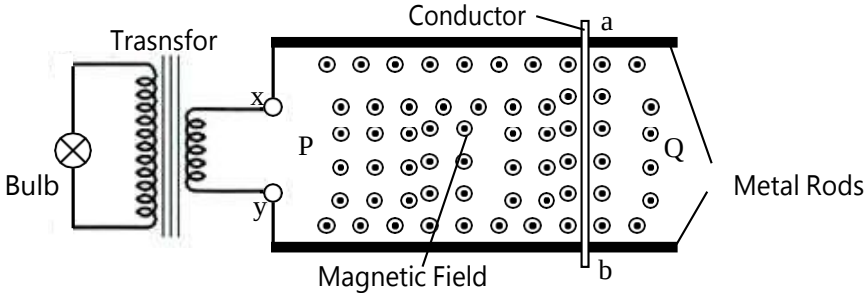
a. PVC (01)

b. Teflon (01)

ii. What is the monomer of polythene which used to make plastic bottles? (01)

iii. Name two natural polymers. (02)

(C) a and b conductors are placed on a magnetic field after placing them on a smooth metal rod as they can move freely on those smooth metal rods. X and Y ends of the metal rods are connected to a transformer.



i. When the a-b conductor moves from Q to P uniform speed,

a. Write an observation that can be seen. (01)

b. Write the current flowing direction across the primary coil of the transformer with the aid of X and Y. (01)

c. What is the law applied to find the direction of the current flow? (01)

ii. The number of turns in the primary coil is 100 while the number of turns in the secondary coil is 1200, 0.25 Vpotential difference takes place between the X and Y points when this activity.

a. Find the potential difference between the two ends of the bulb when the ab conductor starts to move. (03)

b. Name an instrument which uses electromagnetic induction effectively. (01)

iii. Positive and negative potentials are given to X and Y terminals respectively after removing the transformer.

a. Write the direction of the motion of the rod with the aid of P and Q. (02)

b. Write an instance of a usage of this phenomenon. (01)

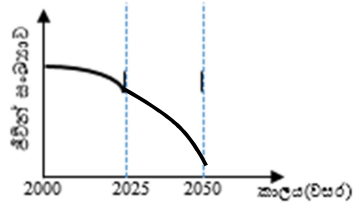
Ministry of Education

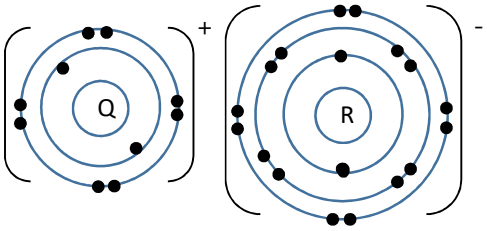
Grade11 | **Supportive Test 2023** | **34** | **S** | **I**

Science I/II | **Answer script**

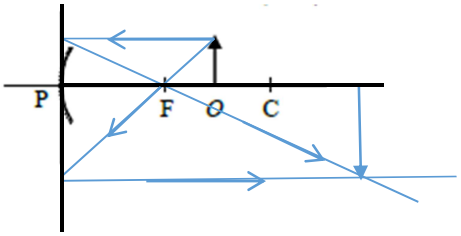
Science Paper 1

Question number	nswer number	Question number	Answer number	Question number	Anmswer number	Questiom number	Answer number
1.	(1)	11.	(1)	21.	(3)	31.	(2)
2.	(1)	12.	(4)	22.	(3)	32.	(3)
3.	(4)	13.	(2)	23.	(3)	33.	(1)
4.	(3)	14.	(3)	24.	(1)	34.	(4)
5.	(3)	15.	(2)	25.	(3)	35.	(4)
6.	(3)	16.	(2)	26.	(2)	36.	(1)
7.	(3)	17.	(2)	27.	(1)	37.	(4)
8.	(1)	18.	(2)	28.	(3)	38.	(1)
9.	(3)	19.	(4)	29.	(1)	39.	(1)
10.	(3)	20.	(3)	30.	(4)	40.	(2)

1.	(A)	(i)		Increasing the global warming	01	15
		(ii)		Greenhouse gases such as CO_2,H_2O,CFC,CH_4	02	
		(iii)	(a)	Deforetation/ Burning fosil fules	02	
			(b)	 mark for the curve of the graph marksif a straight line is drawn ead of a curve mark for the curve that does not reach the zero.	02	
	(B)	(i)		The smart use of the natural resources by safegaurding the balance of the environment in such a manner that the future generation can use them in the future.	02	
		(ii)		(a) Reduce (Avoiding or minimizing the usage of unnecessary items) (b) Answer such as the usage of organic fertilizers instead of chemical fertilizers. (c) Recycle	03	
		(iii)		Wind power stations Solar power stations	01 01	
		(iv)		Taking steps in order to maitain good indoor air circulation / natural ventilation, Utilizing day light harvesting to reduce artificial lighting, Using thick curtains to reduce heat transfer, Rain water harvesting.	01	
2.	(A)	(i)		Nitrogen	01	
		(ii)		Lipid/ Carbohydrates / Protiens. Give marks for any two	02	
		(iii)		K	01	
		(iv)		Delaying blood clotting	01	

	(B)	(i)		A Endoplasmic reticulum B Golgi body	01/00	
		(ii)		E / Nuclear	01	
		(iii)		Production of energy	01	
		(iv)		Cell wall/ Chloroplasts/ Large central vacuole	01	
	(C)	(i)		Scion, Stock in correct order	01	
				Bud grafting/ Twig grafting	01	
		(ii)	(a)	A	01	
			(b)	C	01	15
		(iii)		Phase - Follicular phase – Hormone- Oestrogen Luteal Phase - Hormone - Progesterone	02	
3.	(A)	(i)		B	01	
		(ii)	(a)	Concentration	01	
			(b)	B and C	01	
		(iii)	(a)	$Mg + 2HCl \rightarrow MgCl_2 + H_2$	02	
			(b)	Cannot	01	
			(c)	Cu is prent above Hydrogen in the activity serie/ Reactivity of Cu is less than that of Hydrogen	01	
	(B)	(i)	(a)	Na	02	
			(b)	2, 4	01	
			(c)	R	01	
		(ii)	(a)	PR_4	01	
			(b)	In-between P an- Covalent bonds In- between Q and - Ionic bonds	02	
			(c)		01	15
4.	(A)	(i)	(a)	Not applying external unbalanced force/ / Forces are in equilibrium/ / Frictional force becoming equal to the force applying by the engine.	01	
			(b)	Acceleration	01	
			(c)	Applying an unbalanced force/Applying a resultant force / Applying an external unbalanced force	01	
		(ii)		Static frictional force	01	
		(iii)		Advantage – Can move without slipping./ Suppling the force requrired for the motion. Disadvantage – Tyres wear much faster.	01 01	
		(iv)	(a)	2.5 m s^{-2}	01	
			(b)	20 m	02	
			(c)	Newton's First law.	01	
	(B)	(i)		Downwards due to the gravity (W) Upward from the legs (R)	01 01	15
		(ii)	(a)	R = W = mg = 80 x 10 = 800 N	01	
			(b)	↑ F = ma , R-W = ma , R-800 = 80 x 0.5 ,R = 40+800 , R = 840 N	02	
5.	(A)	(i)		Correct defenition of the photosynthesis	01	

		(ii)		Material - B , C Non material -A The answer should be given by using the given letters.	03	
		(iii)		Iodine solution	01	
		(iv)	(a)	Sucrose	01	
			(b)	Complex permanant tissues	01	
		(v)		• Removing the CO_2 from the environment that is accumilated due to f respiration and combustion. • Producing food for organisms.	02	
	(B)	(i)		Dominant - Blue (01), Recessive – White (01)	02	
		(ii)		BB - Blue bb - White	02	
		(iii)		<table><tr><td></td><td>B</td><td>b</td></tr><tr><td>b</td><td>Bb</td><td>bb</td></tr><tr><td>b</td><td>Bb</td><td>bb</td></tr></table> Genetype Blue -Bb White -bb	02	
		(iv)		Proveide marks for showing the possibility of obtaining pure breeding blue flower plants continously in generations.	02	
	(C)	(i)		Thyroid gland	01	
		(ii)		Adrenalin	01	
		(iii)		Converting glucose into glycogen	01	20
6.	(A)	(i)	(a)	Evolving of gas bubbles/ Colour change/ Reduction of the blue colour / Deposition of reddish brown colour substance on the pin.	02	
			(b)	Because pencil rods act as innert electrodes.	01	
		(ii)	(a)	A and C	02	
			(b)	<table><tr><td>Stong acid</td><td>Weak acid</td></tr><tr><td>• Release H^+ ions by complete ionisation in aqueous medium.</td><td>Release H + ions byincomplete ionisation in aqueous medium.</td></tr><tr><td>• No free acid moleculesm in the solution.</td><td>Fre acid molecules in the solution.</td></tr></table> For any of the above one difference.	02	
			(c)	I. Y, X, Z II. X, Z	01 01	
	(B)	(i)	(a)	P- Funnel Q- Watch galss R- Tripple beam balance S- Volumetric flask	02	
			(b)	For calculating Relative Molecular Mass (01) 160 g (01)	02	
			(c)	1 Mole 160 g , 0.1 Mole 160/10 =16 g	01	
			(d)	• Weigh 16g of $CuSO_4$ into a watch glass and transfer to the 250 cm^3 volumetric flask by using the wash bottle and the funnel. • Add about 2/3 of the required volume of water and shaking until mix completely. • After all the content dissolved well, add water carefully, keeping the eye at the levelof the volume mark ofthe flask. • Stopper the flask and mix again.	04	20
		(ii)		Giving the formula for the calculation of the mass (01) 10 g/100 g = 1/10	02	

				or 1/10 (01)		
7.	(A)	(i)			03	
		(ii)		Invert,real,mgnified give marks for any two features	02	
		(iii)		Shaving/ examining teeth/ Reflecting telescopes/ Microscope	01	
	(B)	(i)		$W = mg$ /500 kg x 10 (01)= 5000 N (01)	02	
		(ii)		$E = mgh$ / 500 kg x 10 m s^{-1} x 5 m (01) = 25 000 J (01)	02	
		(iii)		Kinetic energy and potential energy	02	
		(iv)	(a)	½ $m v^2 = mgh$ or v = $\sqrt{2gh}$	01	20
			(b)	$v = \sqrt{2x\ 10\ x\ 5}$ = 10 m s^{-1}	02	
		(v)	(a)	Work = 5000 N x 5 m = 25000 J	02	
			(b)	25000 J/4 s = 6250 W	01	
			(c)	$E = VIt$ / $I = E/Vt$ = 25000 J / 4 x 230= 27.17 A or $P = VI = P/V$ = 6250/230 = 27.17 A	02	
8.	(A)	(i)		X - O_2 Y - CO_2	02	
		(ii)		Diffusion	01	
		(iii)		² Thin walls ² Moistened walls ² Highly vascularized surface • High surface area	02	
	(B)	(i)		The contractions and dilations of heart muscle are known as the heartbeat.	01	
		(ii)		Bicuspid valve / Tricuspid valve	01	
		(iii)		Atrial and Ventricular relaxation (Complete cardiac diastole)	01	
	C	(i)		Nephron	01	
		(ii)		Urea/ Uric acid	01	
		(iii)		Fecal matter is the undigested materials of the digestion process. Not a product of metabolic reactions.	01	
	D	(i)		Parrelal method	01	
		(ii)		Electromotive force	01	
		(iii)		$V = IR$, $I = V/R$= 9 V/6 = 1.5 A	01	
		(iv)		$E = VIt$ = 9 V x 9/4 A x1s = 20.25 J	01	
		(v)		Increase	01	
	D	(i)		Upthrust	01	
		(ii)	(a)	Decrease	01	20
			(b)	Decreaee	01	
			(c)	Up thrust reduces when the volume of water decreases. As a result the weight ofthe object increases. Then the resultant force acts downwards.	02	
9.	(A)	(i)		From Zn plate to Cu plate	01	
		(ii)		Cu plate	01	

		(iii)		$Zn\ (s) \longrightarrow Zn^{2+}\ (aq) + 2e$	01	
		(iv)	(a)	Zn	01	
			(b)	Welding to the hulls of the ships sailing in the sea / Coating under ground GI pipes.	01	
	(B)	(i)	(a)	PVC- Gutters, Water pipes, conduits and flexible pipes.	01	
			(b)	Teflon- Making non- stick cooking pans, snow shoes.	01	
		(ii)		Ethene	01	
		(iii)		Starch / rubber/protien /Cellulose	02	
	(C)	(i)	(a)	Bulb glows and off	01	
			(b)	From X to Y	01	
			(c)	Flemming's right hand rule.	01	
		(ii)	(a)	$\frac{V_p}{V_s} = \frac{N_p}{N_s}$ (01) $\frac{0.25\ V}{V_s} = \frac{100}{1200}$ (01) V_s = 12 x 0.25= 3 V (01)	03	
			(b)	Dynamo/ Moving coil microphone	01	20
		(iii)	(a)	To Q	02	
			(b)	Direct current motor	01	