ET/SSS/2022(2023)/OL/34/S/Q/S-1

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கல்வி அமைச்சு
Ministry of Education

G. C. E. Ordinary Level | අ. පො. ස. සාමාන්‍ය පෙළ | 2022 (2023)

Student Seminar Series

ශිෂ්‍ය සම්මන්ත්‍රණ මාලාව

Practice Paper | උපකාරක ප්‍රශ්න පත්‍ර

Science

විද්‍යාව

Question Paper - I, II | ප්‍රශ්න පත්‍රය - I, II *English Medium*

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අධ්‍යාපන අමාත්‍යාංශය

கல்வி அமைச்சு

Ministry of Education, Sri Lanka

34	S	I

අ. පො. ස. සාමාන්‍ය පෙළ විභාගය - ශිෂ්‍ය සම්මන්ත්‍රණ මාලාව - 2022 (2023)

கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை- மாணவர் கருத்தரங்கு தொடர் - 2022 (2023)

G. C. E. Ordinary Level Examination – Student Seminar Series

විද්‍යාව I

விஞ்ஞானம் I

Science I

පැය එකයි.

ஒரு மணித்தியாலம்

Three 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 question.
- Mark a cross (X) on the number corresponding to your choice in the answer sheet provided.

1. Examples for a polysaccharide and a disaccharide are respectively,

(1) sucrose and starch
(2) glycogen and glucose
(3) starch and galactose
(4) cellulose and sucrose

2. By having a large number of mitochondria in skeletal muscle cells,

(1) more glucose is stored.
(2) more energy is produced.
(3) production of lipids and steroids is reduced.
(4) synthesis of protein is reduced.

3. When the relative atomic mass of an element is measured in grams, the number of atoms in that amount is equal to,

(1) Avogadro constant.
(2) a mole of molecules.
(3) relative molecular mass.
(4) molar mass.

4. In which instance given below, the velocity is correctly mentioned?

(1) 10 m s^{-1} (2) 10 m $s^{-1}$to the east (3) 10 m s^{-2} (4) 10 m s^{-2} to the east

5. Which of the following is a polar covalent compound?

(1) HCl (2) KCl (3) CH_4 (4) NaCl

6. In which answer given below is the botanical name of papaw plant given correctly?

(1) CARICA PAPAYA
(2) Carica Papaya
(3) *carica papaya*
(4) *Carica papaya*

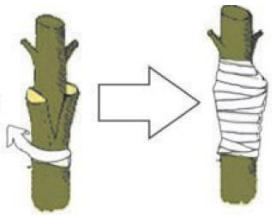
7. When an emersion heater of 1000 W connected to a power supply of 250 V, what is the current that flows through its heating coil?

(1) 0.25 A (2) 0.4 A (3) 4 A (4) 5 A

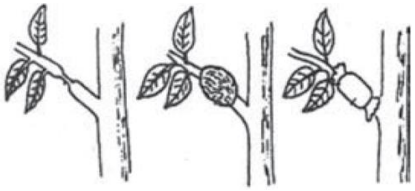
8. What is the ion below that has the same electron configuration as Al^{3+} ion?

(1) Na^{+} (2) K^{+}
(3) Ca^{2+} (4) Cl^{-}

9. Two simple activities used to demonstrate the asexual reproduction of plants are shown by the P and Q diagrams given below.



P



Q

Which answer shows the correct order of these asexual reproductive methods?

	P	Q
(1)	Aerial layering	Twig grafting
(2)	Twig grafting	Tissue culture
(3)	Twig grafting	Aerial layering
(4)	Tissue culture	Aerial layering

10. Electronic configurations of elements S, T, U and V are given below, where S, T, U and V are not standard symbols.

S= 2, 8, 1 T= 2, 8, 4 U= 2, 8, 7 V= 2, 8, 8

Which element given above, has the maximum electronegativity?

(1) S (2) T
(3) U (4) V

11. What is the correct statement below, about friction?

(1) It is the force that opposes the relative motion between two surfaces.
(2) The dynamic frictional force is always greater than the limiting frictional force.
(3) The nature of surfaces does not influence the frictional force.
(4) Frictional force decreases when normal reaction increases.

12. A student on trolley A applies a force on the palms of the student on trolley B. What can be observed in this instance?

A B

(1) Both A and B are pushed apart.
(2) A is pushed towards the direction of the motion of B.
(3) B is at rest while, only A is moved.
(4) A is at rest while, only B is moved.

13. What is the balanced chemical equation given below?

(1) $2Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2$
(2) $CaCO_3 \longrightarrow 2\,CaO + CO_2$
(3) $2NaOH + HCl \longrightarrow NaCl + H_2O$
(4) $2KMnO_4 \longrightarrow K_2MnO_4 + MnO_2 + O_2$

14. Water absorption during the process of food digestion mainly takes place in,

(1) stomach (2) small intestine
(3) anus (4) large intestine

15. Given below are some statements about a diver. Select the **false** statement out of them.

(1) If the diver wants to be under constant pressure, he should move horizontally in water.
(2) When he moves deeper in water, pressure exerted on him increases.
(3) When he moves deeper, pressure exerted on him decreases.
(4) When the diver reaches towards the surface of water, pressure on him decreases.

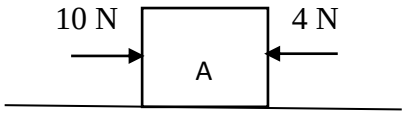
16. A characteristic of asexual reproduction is,

(1) contribution to evolution.
(2) production of offsprings with variations.
(3) occurrence of meiosis and mitosis.
(4) production of offsprings identical to parent.

17. What is the instance below that HCl acid is used?

(1) Preparation of battery acid.
(2) Production of artificial thread in textile industry.
(3) Production of soap, paper, artificial silk and paints.
(4) Preparation of gelatin using bones in food technology.

18. The object A is at rest on a smooth uniform surface. If two continuous horizontal forces are applied on object A, as shown in the figure below towards opposite directions, it moves,



(1) towards the force of 10 N in uniform velocity.
(2) towards the force of 10 N in uniform acceleration.
(3) towards the force of 4 N in uniform velocity.
(4) towards the force of 4 N in uniform acceleration.

19. Equal masses of Mg ribbon and small pieces of Mg were put into test tubes P and Q containing equal volumes of HCl acid with equal concentrations.

Consider following statements about the observation.

A- Rate of evolving gas bubbles in tube Q is greater than that of P.

B- Piece of Mg disappears quickly in tube P.

Out of these statements,

(1) A is true and B is false.
(2) A is false and B is true.
(3) both A and B are true.
(4) both A and B are false.

20. Some plant parts are given below.

P- Coconut coir Q- Potato tuber R-Veins of dicot leaf

The plant parts that contain parenchyma, collenchyma and sclerenchyma tissues respectively,

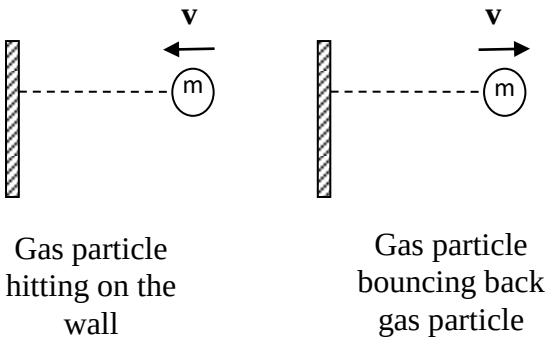
(1) P, Q and R (2) Q, R and P (3) Q, P and R (4) R, P and Q

21. Select the group that contains natural polymers only?

(1) Starch, protein, DNA and cellulose.
(2) Protein, DNA , cellulose and polythene
(3) DNA, cellulose, polythene and Teflon.
(4) Cellulose, nylon, terylene and starch.

22. A gas particle of the mass of **m**, hits on a wall in uniform velocity and bounces back in the same velocity. What happens to kinetic energy and momentum of the gas particle?

	Kinetic energy	Momentum
(1)	Changes	Changes
(2)	Does not change	Change
(3)	Does not change	Does not Changes
(4)	Changes	Does not change



Gas particle hitting on the wall

Gas particle bouncing back gas particle

23. The main function of human kidneys is,

(1) production of urea.
(2) production of hormones
(3) generating immunity.
(4) removal of excretory products.

24. Four methods of preparations used by four students to prepare standard solutions in the laboratory are given below. In which occasion the composition can be expressed in terms of concentration (*n /v*) ?

(1) Preparation of the solution by dissolving 18 g of glucose in 100 cm^3 of water.
(2) Preparation of the solution by dissolving 0.1 mol of glucose in water till the solution becomes100 cm^3.
(3) Preparation of the solution by dissolving 18 g of glucose in 100 g of water.
(4) Preparation of the solution by dissolving 0.1 mol of glucose in water till the solution becomes 100 g .

25. An object is released to fall freely at a height of 2 m from the ground. What is the true statement about the motion of the object? (Neglect the air resistance acting on the object.)

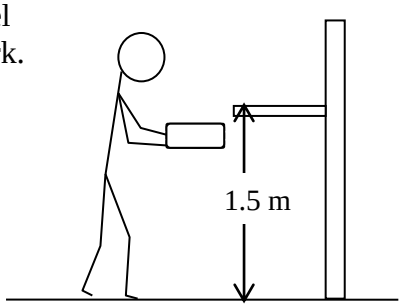
(1) Velocity remains constant.
(2) Acceleration remains constant.
(3) Acceleration increases gradually.
(4) Acceleration of the object depends on the mass of it.

26. A disease associated with respiratory system is,

(1) atherosclerosis (2) typhoid (3) bronchitis (4) thrombosis.

27. A man lifts a box, that weighs 300 N, from the ground level to a rack at the height of 1.5 m . He took 2 s to do this work. What is the power of the man?

(1) 150 $J\ s^{-1}$
(2) 225 $J\ s^{-1}$
(3) 300 $J\ s^{-1}$
(4) 400 $J\ s^{-1}$



28. What is an **observation**, when electrolyzing an aqueous solution of $CuSO_4$ using carbon electrodes?

(1) Oxygen gas evolves at the anode.
(2) Part of anode in solution becomes reddish brown.
(3) Part of cathode in solution becomes reddish brown.
(4) Gas bubbles evolve at the part of cathode in solution.

29. Consider the following statements about human blood circulatory system.

A- Veins convey blood towards the heart while arteries convey blood away from the heart.
B- Arteries carry oxygenated blood while veins carry deoxygenated blood.
C- There are valves opened towards the heart in veins.
The true statements are,

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

30. In an experiment of finding the specific heat capacity, a metal block of 4 kg was heated from 30 ^{O}C to 40 ^{0}C. Total energy gain of the object was 8200 J. What is the specific heat capacity of the metal block?

(1) 205 J kg^{-1} $^{o}C^{-1}$ (2) 480 J kg^{-1} $^{o}C^{-1}$
(3) 1680 J kg^{-1} $^{o}C^{-1}$ (4) 2050 J kg^{-1} $^{o}C^{-1}$

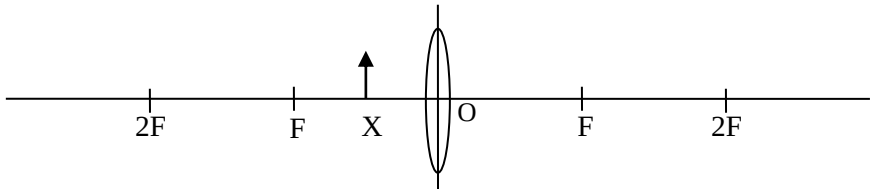
31. Consider the following statements associated with Zn/Cu electro chemical cell.

A- Zn metal is oxidized.
B- Cu metal is known as the anode.
C- Electrons flow from Zn metal to Cu metal through external circuit.

Which of the above statements are true?

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

32. Figure below shows how the object X is kept in front of a convex lens.



What is the correct statement about the image of object X, out of those given below?

	Nature of the image	Place of formation
(1)	Real, magnified, upright	Away from F , on the other side of the object
(2)	Real, magnified, inverted	Away from F , on the same side of the object
(3)	Virtual, diminished , upright	Away from F , on the other side of the object
(4)	Virtual, magnified, upright	Away from F , on the same side of the object

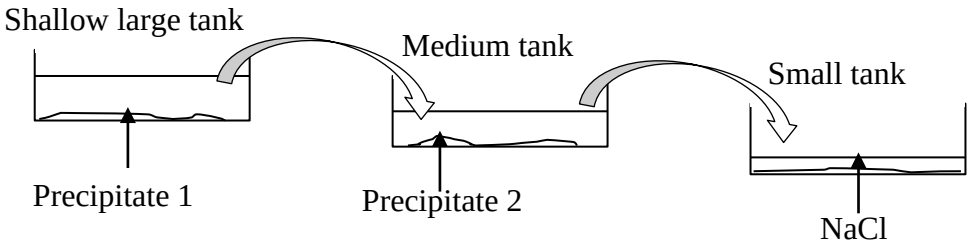
33. A, B, C and D are four parts of a flower as,

A- Petals B - Anther C - Ovary D – Sepals

The essential parts for reproduction, out of those given above are,

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

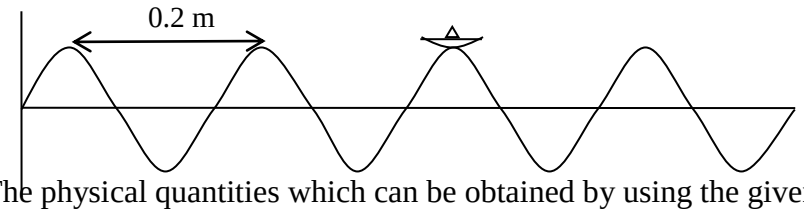
34. Shown below is a block diagram related to salt extraction.



What is the correct choice about precipitate 1 and precipitate 2?

	Precipitate 1	Precipitate 2
(1)	$CaSO_4$	$CaCO_3$
(2)	$CaSO_4$	$MgSO_4$
(3)	$CaCO_3$	$CaSO_4$
(4)	Na_2CO_3	$CaSO_4$

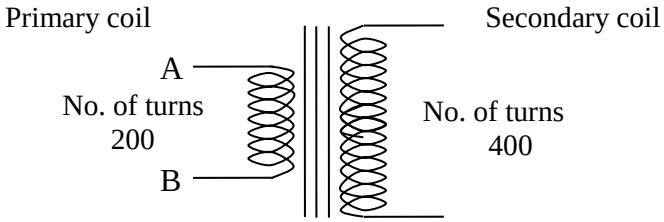
35. Paper boat is kept on the surface of water, through which a wave of water is moving.
A - The water wave swings vertically up and down 15 times per minute.
B - Distance between two successive crests of the wave is 0.2 m.



The physical quantities which can be obtained by using the given above data about the wave are,

(1) amplitude and frequency (2) frequency and wave length
(3) wave length and speed (4) speed and amplitude

36. What is the voltage induced in the secondary coil, when the primary coil is connected to an alternating current supply of 15 V, as shown in the figure of transformer below ?



(1) 60 V (2) 45 V (3) 30 V (4) 15 V

37. Four gases below are labelled as A,B,C and D,

A - Carbon dioxide
B -Chlorofluorocarbon
C - Nitrogen dioxide

D- Sulphur dioxide

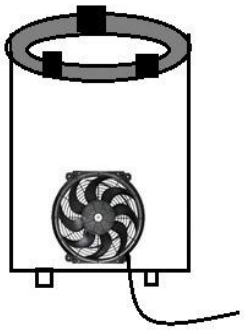
From above gases, the gases that contribute for acid rains are,

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

38. What can be the most appropriate long term solution for the present energy crisis in Sri Lanka?

(1) Exploration of petroleum resources in Sri Lanka.
(2) Make people knowledgeable of energy wastage.
(3) Purchase petroleum from world market at a low rate.
(4) Promotion of renewable energy resources.

39. An improved stove presented in a science exhibition is shown in figure below. What is the point that **should not** be emphasized to the spectators of the exhibition about stove?



(1) That, the product of combustion can be removed using a fan.
(2) That, supply of supporter of combustion can be supplied using a fan.
(3) That, the stove can be further improved.
(4) That, electricity for functioning the stove should be obtained from the national grid.

40. Outbreak of pandemics occurred in the world from time to time. One of the measures taken to protect from them was, to follow good health habits.
Some of the habits followed by people for this are given below.

(A) Using face masks.
(B) Maintaining cleanliness of body.
(C) Following traditional superstitious treatments (“kem krama”).

What habits above are recommended by you, as a science student?

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

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கல்வி அமைச்சு
Ministry of Education, Sri Lanka

34	S	II

අ. පො. ස. සාමාන්‍ය පෙළ විභාගය - උපකාරක සම්මන්ත්‍රණ මාලාව - 2022 (2023)
கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை- ஆதரவு கருத்தரங்கு தொடர் - 2022 (2023)
G. C. E. Ordinary Level Examination - Support Seminar Series - 2022 (2023)

විද්‍යාව I, II
விஞ்ஞானம் I, II

පැය තුනයි.
மூன்று மணித்தியாலம்
Three Hours

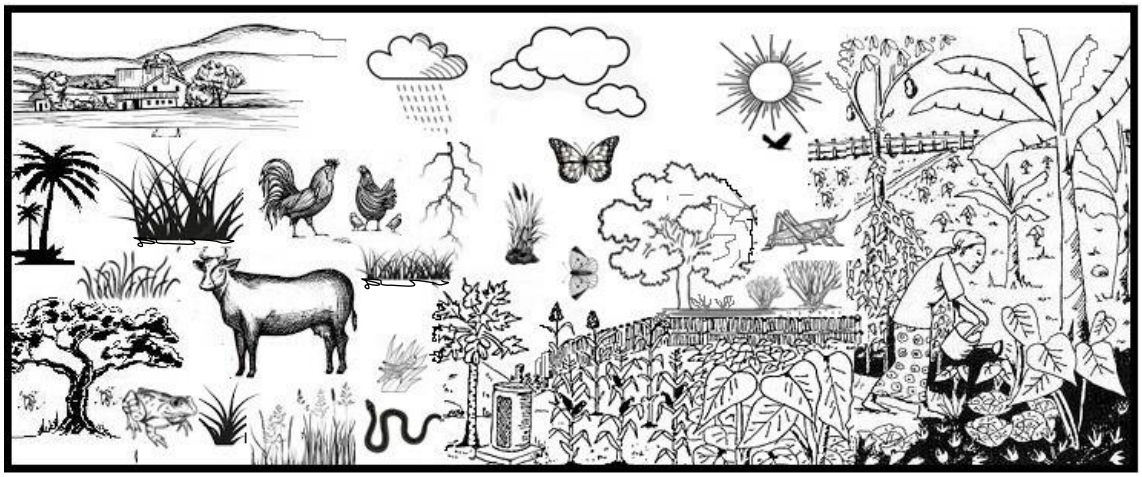
අමතර කියවීම් කාලය - මිනිත්තු 10 යි.
மேலதிக வாசிப்பு நேரம் - 10 நிமிடங்கள்
Additional Reading Time – 10 minutes

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, tie Part A and the answer script of Part B together and hand**

Part A

1. (A) A home garden that contributes for food security is shown in the figure.



Earlier, only organic manure was used for this garden. But later chemical fertilizer and pesticides were also used.

(i) Construct the food chain of three links using the organisms shown in the figure .

..... (01)

(ii) Mention the organism badly affected by the bio magnification in the above food chain.

……..….. (01)

(iii) Name a biogeochemical cycle that can be used to explain the process of cyclic circulation of essential chemical components through biosphere.

……..…… (01)

(iv) Mention two reasons to consider the home garden as an ecosystem.

- .....
- ..... (02)

(v) Mention an **advantage** of applying organic manure to the soil.

..... (01)

(vi) Pesticides and chemical fertilizers were extensively used later for this home garden. Write two heavy metals that can be added to soil because of this addition.

.....

……..... (01)

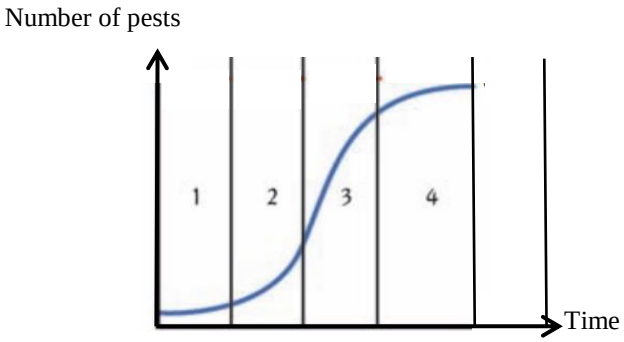
(vii) Mention an advantage of multiple cropping.

..... (01)

(viii) Mention two methods of generating energy for the domestic activities from this environment.

- ……....
- …… (02)

(B) Growth curve below shows the variation of the number of organisms of a pest species with time.



(i) What is the term used for the number of organisms in unit area of selected habitat?

..... (01)

(ii) Give a reason for the rapid growth of population in the second phase of the growth.

..... (01)

(iii) Draw a dotted line on the growth curve, to show the variation of the number of pests, if a pesticide is applied at the end of the fourth phase. (01)

(C) Consumption of food grown in home garden reduces the food mile.

(i) What is known as **"food mile"**?

.....

.... (01)

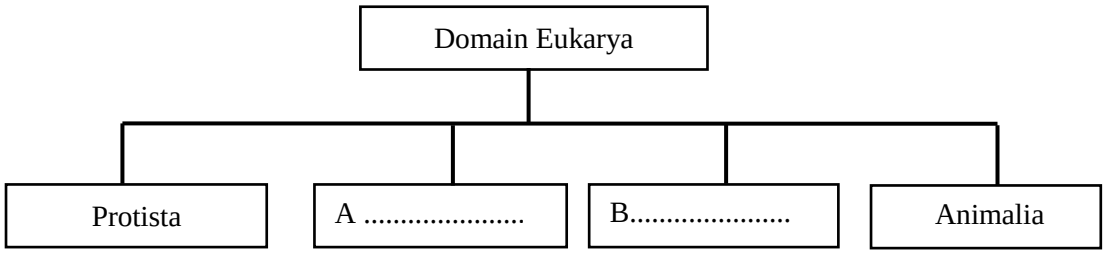
(ii) Clarify briefly how food mile is reduced by consuming food items grown in home garden.

.....

…… (01)

15

2. (A) A part of natural classification system, which is used in classifying organisms is shown below.



(i) Write classification levels that can be applied to A and B in relevant blanks. (02)

(ii) What is the specific characteristic which is based in natural classification?

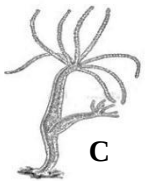
..... (01)

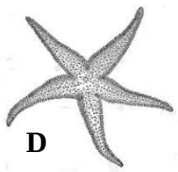
(iii) Two invertebrates are shown in figures C and D.

Name the phyla that C and D animals belong to.

C - .....

D - ..... (02)


C


D

(iv) (a) From the animals shown in the above C and D letters, indicate the letters relevant to the animal who bears tube feet and cnidocytes respectively.

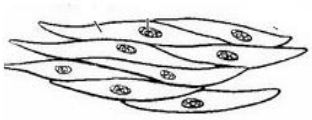
Tube feet -..... Cnidocysts - ..... (02)

(b) Write the name of the animal who lives only in marine environments.

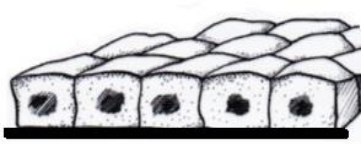
..... (01)

(B) Three types of tissues found in animals are shown below as A,B and C.

A



B



C

(i) Complete the following table in relation to those tissues.

tissues	Name of tissues	Location	Function
A	Nervous tissues	Brain and spinal cord	(a) .....
B	(b)	(c)	Contraction and relaxation of muscles.
C	(d)	(e)	Lining up of free surfaces

(05)

(ii) Mention a main difference between the tissue labelled A in above figure and human blood tissue.

.....

..... (01)

(iii) Name the special type of muscle tissue with intercalated discs which is not mentioned in the above table.

..... (01)

15

3.(A) Three groups of students prepared oxygen, carbon dioxide and hydrogen gases in the school laboratory. The students reported some information about the gases as given below, labelling these gases as X,Y and Z randomly.

Gas collected	X	Y	Z
Reactants used	Mg and HCl	$CaCO_3$ and HCl	$KMnO_4$
Method of collecting the gas	Downward displacement of water or downward displacement of air	Downward displacement of water or upward displacement of air	Downward displacement of water.

(i) Identify and name the gases X and Y.

X ……..……. Y ……..... (02)

(ii) Write the balanced chemical equation associated with the preparation of gas X.

..... (02)

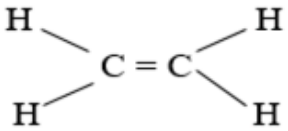
(iii) What is the type of reaction used to prepare gas X, according to its nature?

..... (01)

(iv) Mention simply how the gas Z is identified in the laboratory.

..... (01)

(B) Alkenes are hydrocarbons that contain C=C double bonds and C- H bonds only. The structure of ethene, which is the implest alkene, is given below.



(i) Mention the reason for identifying ethene as hydrocarbon.

..... (01)

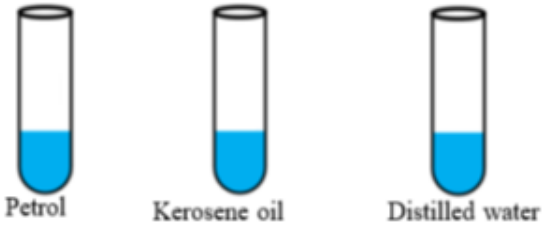
(ii) Draw the repeating unit of polythene,

(01)

(iii) Mention a method that polythene can be used ecofriendly.

..... (01)

(C) Newspapers reported instances where petrol was mixed with kerosene oil or water. To test this a group of students took equal volumes of petrol, kerosene oil and distilled water into three test tubes.



(i) Mention whether the mixture formed during following is homogeneous or heterogeneous.

(a) Petrol and kerosene oil - ..... (01)

(b) Petrol and distilled water - ..... (01)

(ii) Clarify the reason for forming a homogeneous solution, when one of the liquids mentioned above is mixed with petrol.

……

……..…… (01)

(D) Student A and student B , took 50 g of distilled water into two beakers separately. Student A dissolved 27 g $MgCl_2$ and student B dissolved 25 g $MgCl_2$ in their beakers separately. Solubility of $MgCl_2$ in water is 53.0 g in room temperature.(Consider the room temperature as 25^0C)

(i) Which student can dissolve his amount of $MgCl_2$ completely in 50 g of water?

..... (01)

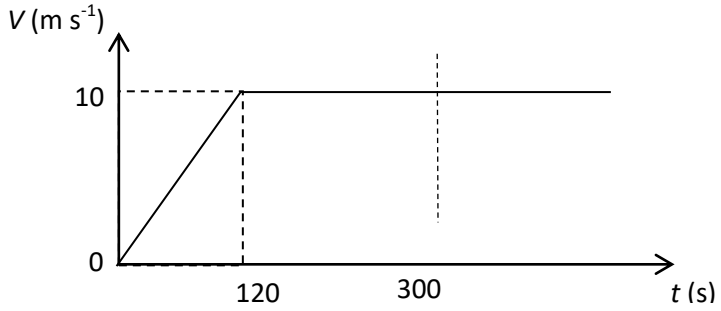
(ii) Mention a measure that can be used by the other student to dissolve his remaining amount of $MgCl_2$, without changing the mass of water taken.

..... (01)

(iii) What is the factor that affects the solubility of a gas in water , used in soda water industry?

..... (01)

4. (A) Given below is the velocity-time graph drawn for the motion of a motor vehicle that starts from rest and runs along a straight path.



(i) (a) What is the velocity of the vehicle at 120 s ?

.....(01)

(b) Find the displacement of the vehicle in 0 s- 120 s.

..... (02)

(ii) In between the time interval 120 s-300 s,

(a) What is the external unbalance force acted on the vehicle?

..... (01)

(b) What is the force applied by the engine of the vehicle, if the resistance force acted against the motion is 500 N.

..... (01)

(c) Calculate the amount of work done by the engine of the vehicle during that time.

.....

..... (02)

(B) A copper ball, heated to a temperature of 80 ^{0}C was put into a vessel that contains 500 g of water. The change of temperature with time is given in the table below.

Time(min)	Temperature (^{0}C)
0	30
1	31
2	32
3	33
4	34
5	34
6	33

(i) What was the time period taken by the system to reach thermal equilibrium?

..... (01)

(ii) Temperature started to decrease after five minutes. What is the reason for this?

..... (01)

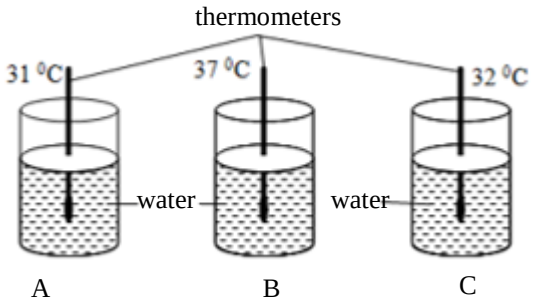
(iii) What is the reason for the transmission of heat from copper ball to water?

..... (01)

(iv) What is the mode of transmission of heat though water in this instance?

..... (01)

(C) Three vessels of silver, black and white in colours , contain equal volumes of water at the initial temperature of 28 ^{0}C, was kept in the same place in bright sunlight. After 30 minutes, the readings of thermometers were as shown in the diagram below.



(i) Arrange the three vessels according to the ascending order of absorbing heat radiation.

..... (01)

(ii) What could be the colour of the vessel that absorbed more heat radiation?

.... (01)

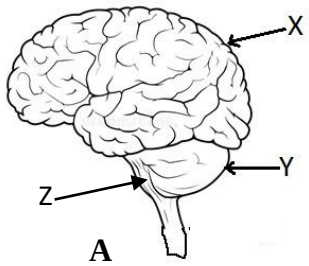
(iii) Mention a point that should be considered when taking a measurement accurately using a thermometer.

..... (01)

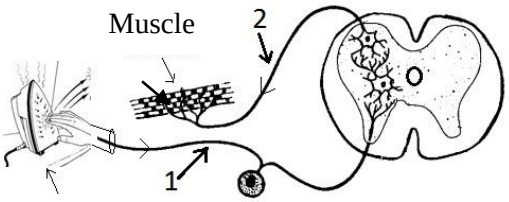
15

Science II – Part B

5. (A) A diagram that shows the parts of brain and another diagram that shows the path of impulse in reflex action are given below.



A



Heated iron

B

(i) (a) Name the parts X and Z. (02)

(b) Mention the function of part Y. (01)

(ii) Name the neurons labelled as 1 and 2. (02)

(iii) Mention,

(a) The stimulus (01)

(b) The effector (01)

in connection to above reflex action.

(iv) What is the functional unit of nervous system? (01)

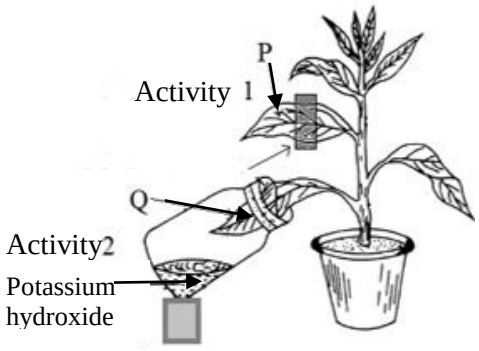
(v) What is the term given to the nervous system formed by the nerves connected to the ganglia located either sides of spinal cord? (01)

(vi) Mention a difference between nervous coordination and chemical coordination. (01)

(vii) Mention a characteristic of hormones which are responsible for chemical coordination. (01)

(B) Shows below is a diagram of a set-up arranged to test the factors necessary for photosynthesis.

(i) Mention the factors which are expected to test, in connection to photosynthesis by the activities 1 and 2 separately. (02)



(ii) After keeping the plant for few hours in the sun, both leaves in activity 1 and activity 2 were tested for starch. Mention the colours of parts of leaves P and Q respectively after the test. (02)

(iii) (a) What is the reason for boiling the plant leaf in alcohol? (01)

(b) What is the reason for using a hot water bath when boiling in alcohol? (01)

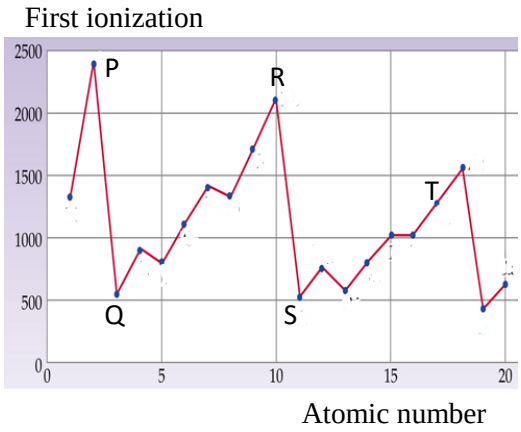
(iv) "Glucose is produced in photosynthesis but the plant leaf is tested for starch ." What is the reason forthis ? (01)

(v) What is the compound that is translocated through phloem tissue? (01)

(vi) Mention global importance of photosynthesis. (01)

(20 marks)

6. (A) The graph below shows the variation of first ionization energy of the elements of atomic numbers 1 to 20.



(i) Write the elements P, Q, R and T according to the ascending order of their first ionization energy. (01)

(ii) Write the numbers of the groups that the first ionization energy is maximum and minimum respectively.(When a single period is considered.) (02)

(iii) Write the chemical equation associated with the first ionization energy of the element Q. (02)

(iv) A student had mentioned an isotope of the elements X as $^{37}_{17}X$. What can be the element in the above graph , represented by X? (01)

(B) Three compounds familiar to you are shown below.

CO_2	NaCl	$AlCl_3$

(i) Classify the above compounds as ionic and covalent according to their bond nature. (02)

(ii) What is the compound from the above, that electron octet is not completed while covalent bonds are forming ? (01)

(iii) Answer the following questions which are related to CO_2. (C=12, O=16)

(a) Calculate the relative molecular mass. (01)

(b) What is the molar mass ? (01)

(c) What is the amount of moles contained in 88 g ? (01)

(d) Draw the Lewis structure of the molecule. (02)

(C) Consider the information given below on the compounds A, B, C and D.

(A) – Aqueous solution contains H^+ but molecules of compound does not contain in aqueous solution.

(B) – Aqueous solution contains OH^- but molecules of compound does not contain in aqueous solution.

(C) - Aqueous solution contains H^+ as well as molecules of compound.

(D) - Aqueous solution contains both OH^- and molecules of compound.

(i) Classify A, B, C and D as acids and bases. (02)

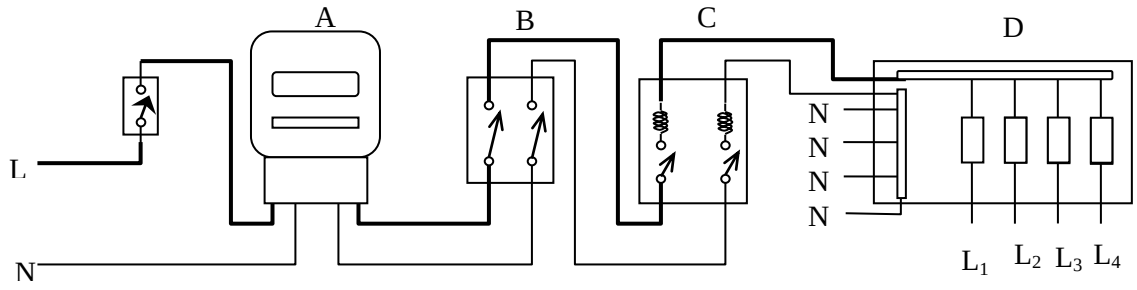
(ii) Write a strong acids and a weak base. (02)

(iii) Arrange the four compounds according to the ascending order of their pH values. (01)

(iv) Write the chemical formula of a salt formed by the reaction of a strong acid and the strong base, which is used as a domestic food preservative. (01)

(20 marks)

7. (A) Shown below is a part of a domestic electric circuit.



(i) (a) Name the appliances A,B,C and D. (04)

(b) Mention the function of appliances C and D separately, (02)

(ii) Given below are some electrical equipment used in a house during a day and the time period of their usage.

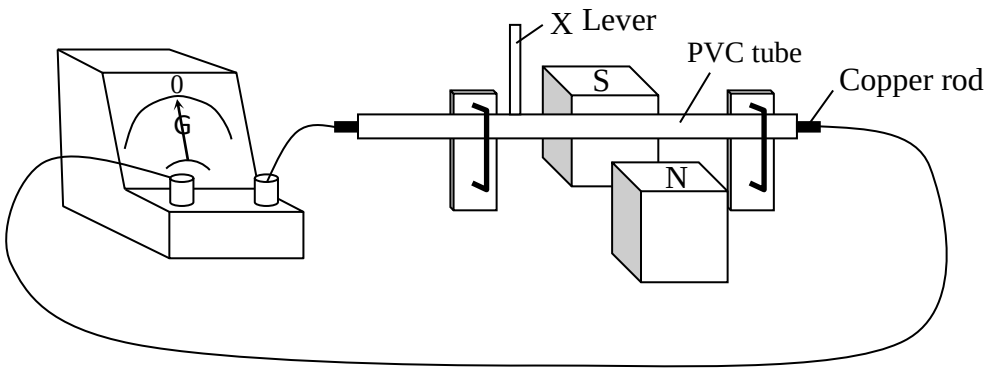
- A filamentous electrical lamp of 5 W and LED bulb of 5 W for one hour each.
- An electrical iron of 750 W for 30 minutes.
- A hot plate of 1500 W for 15 minutes to heat water.

(a) Calculate the amount of electrical energy consumed by the hot plate in joules. (03)

(b) In which instance given above high amount of electric energy is consumed? (02)

(c) A student said that more electric energy is consumed by the 5 W filament lamp, when 5 W filament lamp and 5 W LED lamp are lighted up for one hour. Do you agree with this statement? Give reasons for your answer. (02)

(B) Given below is a figure of a set-up prepared by a group of students for an activity and A and B steps of that activity.



Step A – Moving the lever vertically upwards. Step B- Moving the lever horizontally.

(i) Out of the steps A and B, in which step that the indicator of the galvanometer shows a deflection? (01)

(ii) Mention the reasons for following observations.

(a) The observation in step A. (01)

(b) The observation in step B. (01)

(iii) What is the principle that explains the observations related to part (ii) above? (01)

(iv) Name an equipment produces using that principle. (01)

(20 marks)

8. (A) Human female gamete and male gamete are shown in figures 1 and 2 respectively.

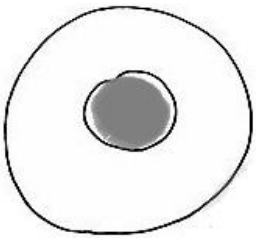


Figure 1

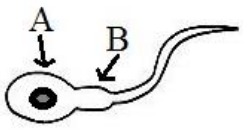


Figure 2

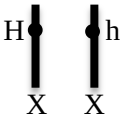
(i) What is the term used for human male gametes? (01)

(ii) Name the part A and B of the above male gamete? (02)

(iii) What is the part of the female reproductive system, where male and female gametes are fertilized? (01)

(iv) Mention respectively the places where male gametes are produced and stored temporally. (02)

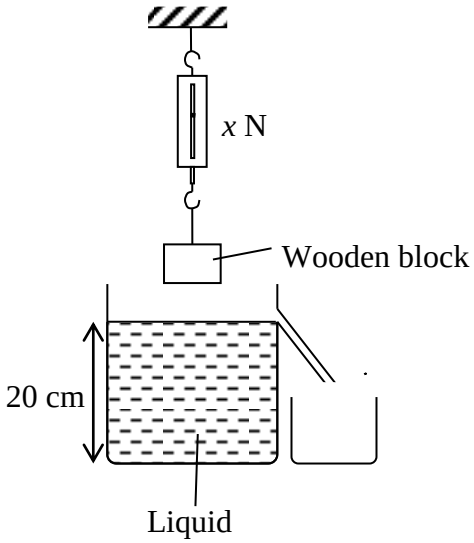
(B) Hemophilia is a hereditary disease caused by a sex-linked recessive gene. Healthy dominant gene is shown as H and recessive gene is shown as h.



(i) Is it a healthy, carrier or diseased female that the genotype shown above belongs to? (01)

(ii) Draw the chart to show the genotype of the offsprings born to the above female, if she marries a diseased male. (03)

(C) Figure below shows a wooden block of mass of 500 g , hung on a spring balance. It is about to dip in a liquid. (The wooden block does not get wet by the liquid.) ($g = 10\ m\ s^{-2}$)



(i) Calculate weight of the wooden block. (02)

(ii) If the height of the liquid in the vessel is 20 cm and the density of the liquid is 800 kg m^{-3}, what is the liquid pressure exerted on a point at the bottom of the vessel? (03)

(iii) If the wooden block will immerse completely and float when it is dipped in the liquid, what is the relationship between the upthrust applied on the wooden block by the liquid and the weight of the object? (01)

(iv) When the wooden block is dipped into the liquid as mentioned part (iii) above, the volume of displaced liquid is collected into another vessel .What is the weight of displaced volume of liquid? (02)

(v) What is the instrument uses to measure the density of salt water during the extraction of salt using see water. Name the theory that can be applied to explain the activity of that instrument. (02)

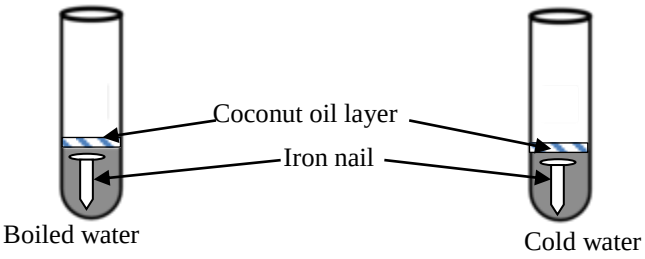
(20 marks)

9. (A) A student observed that some scratched places with moisture of an old galvanized wire in the school fence was rusted. Consider the following two hypotheses related to the above observation.

a. Wire is rusted because it is exposed to air due to removal of zinc coating.

b. Water has contributed for the rusting of iron.

Shown below is a set-up of an activity used to test one of above hypotheses.



(i) Which hypothesis from the given above, that can be tested by this set-up? (01)

(ii) Mention the observations of rusting of iron in the above two setups separately after about a week (01)

(iii) What is the conclusion that can be made according to the above observations? (01)

(iv) Parts of the wire associated with zinc coating are not rusted. Clarify the reason for this. (01)

(v) Draw a labelled diagram of a set-up, that can be used to show whether water is necessary for rusting. (02)

(B) 50 ml of dilute HCl solution and 50 ml dilute NaOH solution with equal concentrations, are mixed together .

(i) Is this reaction exothermic or endothermic? (01)

(ii) Does more energy contain in reactants or in products ? (01)

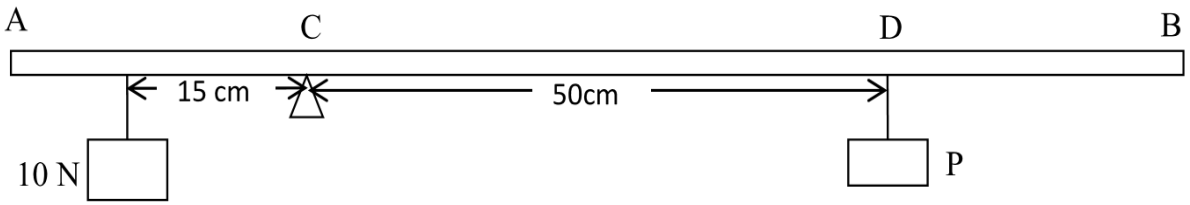
(iii) Mention an exothermic reaction and endothermic reaction respectively that can be identified in day-to-today life. (02)

(C) (i) The figure below shows instances where a bicycle handle is turned and a nail is unscrewed using a spanner.

(a) What is the term used for the two forces acting on the bicycle handle, when it is turned using both hands? (01)

(b) When unscrewing a nail using a spanner, the force exerted becomes less as the handle is longer. Clarify the reason for this scientifically. (02)

(ii) A light strip of wood(the weight of which can be neglected.) , the length of which is 100 cm, is balanced on a knife edge at the point C.



(a) Mention two factors that affect on the moment of force. (02)

(b) Write an equation for the clock wise moment of force acting on the point C of the strip. (01)

(c) What is the anticlockwise moment acting on the point C of the strip? (02)

(d) Calculate the magnitude of the force P. (02)

(20 marks)

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