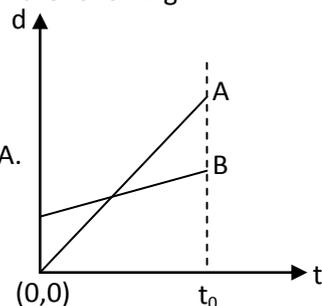


- Answer all the questions.
- Select the correct or the most appropriate answer (1-4) for the questions from 1 to 40.
- Put (x) in the relevant circle

1. The two straight lines shown in the displacement (d) – time (t) graph represent the motion of two objects A and B moving along the positive direction. Which of the following statements made about the motions of the objects is true?

- 1) The object A has travelled for a longer time than B.
- 2) When $t = t_0$ object B has made a displacement greater than A.
- 3) Object A has greater velocity than B.
- 4) Object A has greater acceleration than B.



2. Which of the following elements has the electron configuration 2,8,3?

- 1) Boron 2) Aluminium 3) Phosphorus 4) calcium

3. Which of the following statements correctly define the weight of an object?

- 1) The amount of matter contained in the object
- 2) The force of attraction exerted by the earth on the object
- 3) The product of the mass of the object and its acceleration
- 4) The product of the mass of the object and its velocity

4. What is the main organ that excretes CO_2 and water ?

- 1) kidney 2) skin 3) liver 4) lungs

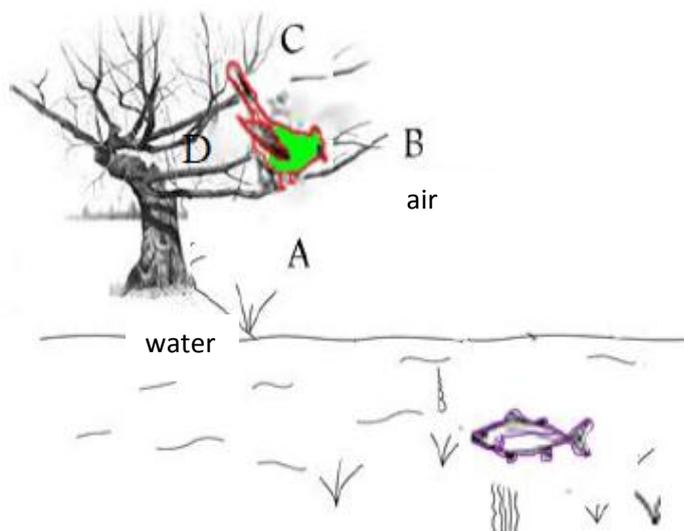
5. Which of the following is a protein?

- 1) glycogen 2) hormone 3) fat 4) cholesterol

6. Which of the following changes is a physical change?

- 1) Burning of a matchstick 2) conversion of alcohol to vinegar
3) Rotting of fruits 4) evaporation of water

7. Of the points A, B, C and D, where will the image of the bird perched on the tree is most likely to be positioned as seen by the fish?



- 1) A 2) B 3) C 4) D
8. Which of the following options contains the correct relative molecular mass of water?
- 1) 17 gmol^{-1} 2) 17 3) 18 gmol^{-1} 4) 18
9. The only living feature shown by viruses is
- 1) having DNA 2) having protein capsule
3) locomotion 4) multiplying
10. Given below are some methods used to separate components of a mixture. Of these, what is the chemical method?
- 1) electrolysis 2) chromatography 3) recrystallization 4) winnowing
11. Which of the following options contains a function that is **not** performed by epithelial tissue in digestive system?
- 1) secretion 2) absorption 3) filtration 4) protection
12. Which option contains the mixture correctly matched with the group it belongs to?

| Mixture | classification |
|------------------------|----------------------------------|
| 1) Salt solution | solid- liquid homogenous mixture |
| 2) sugar solution | solid – liquid heterogeneous |
| 3) brass | solid – solid heterogeneous |
| 4) soda bottle (open) | gas – liquid homogenous |

13. In which of the following instances is a hydrometer **not** used?

- 1) to measure the density of sea water
- 2) to measure the density of milk
- 3) to measure the density of battery acid
- 4) to measure the density of sample of blood

14. The size of the stomata is controlled by the action of guard cells. Which of the following elements contributes to this process?

- 1) Ca 2) P 3) K 4) Zn

15. Acid-base neutralization reaction doesn't occur

- 1) when milk of magnesia is given to heal the burning sensation in stomach
- 2) after applying baking soda to the wound caused by bee stings
- 3) after drinking ash water in an accidental ingestion of kerosene
- 4) after applying lime juice to the wound caused by wasp stings

16. The table below shows how an object operating at uniform velocity changes its displacement with time.

| | | | | | | |
|------------------|---|---|---|---|----|----|
| Time (S) | 0 | 1 | 2 | 3 | 4 | 5 |
| Displacement (m) | 0 | X | Y | Z | 16 | 20 |

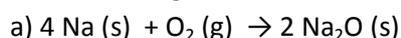
The correct values that x,y and z represent respectively are.

- 1) 1,4 and 9 2) 3,6 and 9 3)4,8 and12 4) 5,7 and 9

17. Which of the following options contains corpuscles with nuclei and without nuclei respectively?

- 1) basophils and RBC 2) neutrophils and monocytes
3) eosinophils and basophils 4) RBC and neutrophil

18. Consider the following two reactions.



Which of the following options correctly expresses the type that each of the reactions given above belongs to?

- 1) a- combination b- decomposition 2) a- combination b- decomposition
3) a- combination b- double displacement 4) a – combination b- combination

19. The magnitude of the upthrust acting on a coconut of mass 3kg floating on water is

- 1) 0N 2) 3N 3) 15N 4) 30N

20. Select the correct frequency range of human hearing (audible range).

- 1) 20Hz - 20000 Hz
- 2) below 20Hz and over 20000Hz
- 3) 20Hz – 25000Hz
- 4) over 20000Hz

21. Select the correct statement made regarding the antidiuretic hormone ADH.

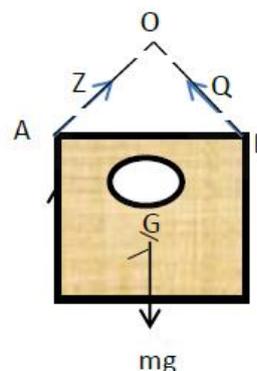
- 1) produced in the cortex of kidney and it increases reabsorption of water
- 2) produce at the medulla of kidney and it reduces the reabsorption of water
- 3) produced by pituitary gland and it increases the reabsorption of water
- 4) produced by adrenal gland and it decreases the reabsorption of water

22. Which of the following statements correctly describes the relationship between the quantities that the moment of force depends on?

- 1) It depends on both, the force applied and the perpendicular distance between the axis of rotation and the line of action
- 2) It depends on the force applied, but not on the perpendicular distance between the axis of rotation and the line of action.
- 3) It does not depend on the force applied, but depends on the perpendicular distant between the axis of rotation and the line of action.
- 4) It does not depend on both the force applied and the perpendicular distant between the axis of rotation and the line of action.

23. The framed picture shown in the figure is balanced by three coplanar force. "G" is the centre of gravity of the picture. Which is correct about the resultant of the two forces Q and Z?

- 1) vertically upwards at O
- 2) vertically downwards at O
- 3) vertically upwards at G
- 4) vertically downwards at G



24. Which of the following groups contains the elements found in lipids?

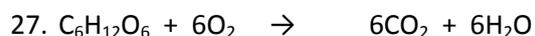
- 1) C,N and O
- 2) C,H and O
- 3) C,H and S
- 4) C,H and P

25. Which of the following statements is correct regarding plating of copper on an iron spoon?

- 1) The iron spoon acts as the anode.
- 2) The copper plate acts as the cathode.
- 3) Copper sulphate solution is the electrolyte.
- 4) A solution of ferrous ion (Fe^{+2}) is used as the electrolyte.

26. What is the reason for recommending broader shoulder straps for school bags?

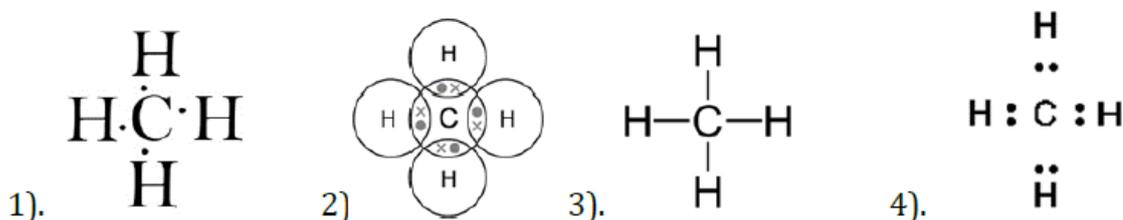
- 1) Larger area of broader straps decreases the pressure exerted
- 2) Larger area of broader straps increases the pressure exerted
- 3) Larger area of broader straps decreases the strength
- 4) Larger area of broader straps increases the strength



Of the statements below, which one is correct regarding the reaction given?

- 1) It is a reduction reaction
- 2) The reaction is related to aerobic respiration
- 3) It is an endothermic reaction
- 4) The reaction is related with photosynthesis

28. Choose the correct Lewis structure of CH_4 molecule.



29. Ice \rightarrow liquid water

In the change of physical state given above, the amount of heat absorbed without increasing the temperature is termed as

- 1) specific latent heat of fusion
- 2) latent heat of fusion
- 3) specific latent heat of vaporization
- 4) latent heat of vaporization

30. Three statements made regarding the blood circulatory system are given below.

- A) Percentage of oxygen is higher in pulmonary artery than aorta.
- B) Percentage of oxygen is higher in pulmonary veins than pulmonary artery.
- c) Pulmonary veins supply blood from lungs to left atrium.

Of these, the correct statements are

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

31. Bottles containing hydrogen peroxide is stored in dark places after closing their lids tight.

What is expected by closing their lids before storing?

- 1) to prevent the entry of sand and dust which act as catalysts
- 2) to prevent the solution from getting discoloured
- 3) to prevent the entry of light
- 4) to prevent the entry of microorganisms

32. The volume fraction of a solution prepared by dissolving 50 cm³ of pure ethyl alcohol in water is 0.25. What is the volume of water containing in this solution?

- 1) 50 cm³ 2) 100 cm³ 3) 150 cm³ 4) 200 cm³

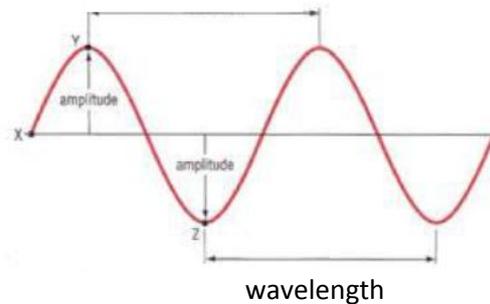
33. Amount of heat required to increase the temperature of 1kg of water from 25°C to 50°C is,(specific heat capacity of water is 4200Jkg⁻¹⁰C⁻¹)

- 1) 10500 J 2) 21000 J 3)105000 J 4) 210000 J

34. Select the pair of sexually transmitted diseases caused by viruses.

- 1) Gonorrhoea and Syphilis 2) Gonorrhoea and Herpes
3) Syphilis and AIDS 4) Herpes and AIDS

35. The figure given below shows the progression of a wave with in a duration of 2 s . What is the frequency of this wave?

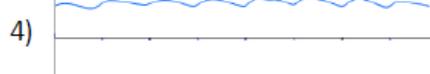
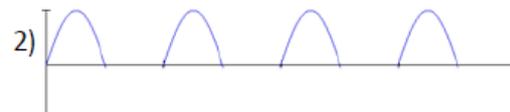
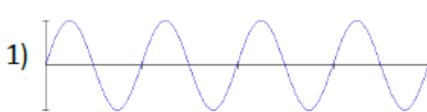


- 1) ½ Hz 2) 1Hz 3) 2Hz 4) 4Hz

36. The concentration of the luteinizing hormone in the blood maximizes

- 1) on the day of ovulation 2) 14 days prior to ovulation
3) 21 days after ovulation 4) 7 days prior to ovulation

37. Which of the following shapes will be displayed on an oscilloscope if the signal after half wave rectification is fed to it?



38. Which of the following statements made with regard to the residual current circuit breaker (RCCB) used in house wiring circuits is wrong?

- 1) RCCBs detect any mismatch between the currents flowing through live and neutral and trip the circuit instantly.
- 2) RCCBs prevent serious harm from ongoing electric shock by instantly tripping the circuit.
- 3) RCCBs do not ensure complete protection of the house from lightning strikes.
- 4) RCCBs automatically turn off the supply when the current in an electrical appliance exceeds the rated value.

39. Which of the following statements is most appropriate to the rapidly spreading chronic kidney disease (CKD) across Sri Lanka?

- 1) CKD can be cured by giving instant treatments
- 2) Only the patients with diabetes and high blood pressure are susceptible to CKD.
- 3) Females are more vulnerable to CKD than males.
- 4) Most of the people contracting the disease are found to have consumed brackish water.

40. It is a major method of releasing hydrocarbons to the atmosphere causing air pollution.

- 1) Complete combustion of coal
- 2) Evaporation occurring in a saltern
- 3) Action of anaerobic bacteria in swamps (marshy land)
- 4) Releasing lava during volcanic eruption

MCQ answer key

| Question number | Answer number | Question number | Answer number |
|-----------------|---------------|-----------------|---------------|
| 01 | 3 | 21 | 3 |
| 02 | 2 | 22 | 1 |
| 03 | 2 | 23 | 1 |
| 04 | 4 | 24 | 2 |
| 05 | 2 | 25 | 3 |
| 06 | 4 | 26 | 1 |
| 07 | 3 | 27 | 2 |
| 08 | 4 | 28 | 4 |
| 09 | 4 | 29 | 2 |
| 10 | 1 | 30 | 3 |
| 11 | 3 | 31 | 1 |
| 12 | 1 | 32 | 3 |
| 13 | 4 | 33 | 3 |
| 14 | 3 | 34 | 4 |
| 15 | 3 | 35 | 2 |
| 16 | 3 | 36 | 1 |
| 17 | 1 | 37 | 2 |
| 18 | 2 | 38 | 4 |
| 19 | 4 | 39 | 4 |
| 20 | 1 | 40 | 3 |

Revision Science (No:2)

- This paper consists of two parts A and B.
- Part A is the structured paper. Write the answers in the space provided.
- From the part B, select only three out of five questions and answer.

PART A

1.

(A) Five kinds of lamps of equal brightness are shown in the schematic diagrams below.

| | | | |
|---|--|---|--|
| <p>Incandescent lamp (filament bulb)</p>  <p>230 V 100 W</p> | <p>Florescent lamp</p>  <p>230 V 40 W</p> | <p>Compact Florescent lamp</p>  <p>230 V 20 W</p> | <p>LED lamp</p>  <p>230 V 7 W</p> |
|---|--|---|--|

i) It is required to find the most efficient lamp of these. Suggest a suitable method for this.

.....
.....

ii) Of these, which lamp could be most efficient?

.....

iii) Write two advantages of having a courtyard for a house.

.....
.....

(B) Improper disposal of garbage results in various environmental issues. E-wastes and other non degradable materials have become top level pollutants.

i) What is environmental pollution?

.....
.....

ii) Addition of non-recyclable materials causes environmental pollution. Write four examples for such materials.

.....
.....

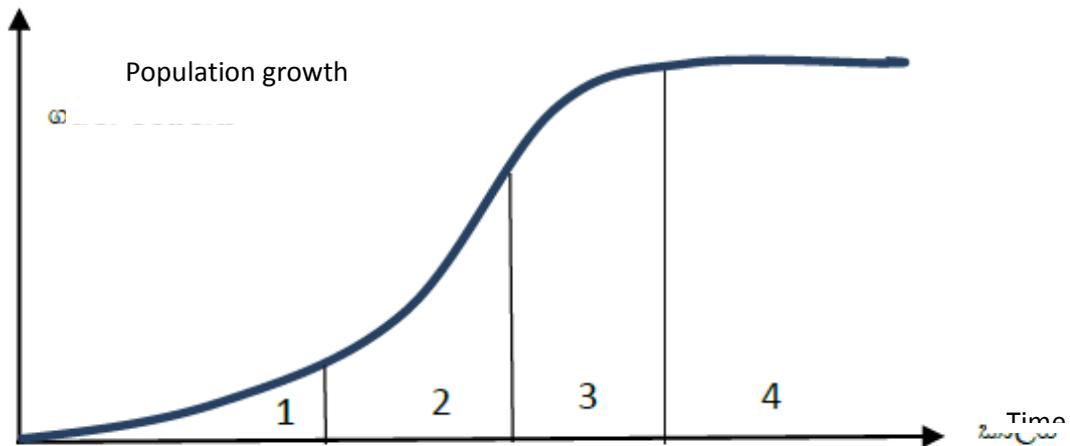
iii) Write a heavy metal possible to be added to the environment due to e-wastes

.....
.....

iv) Write two ways by which heavy metals in the environment enters human body.

.....
.....

(C) The typical curve of population growth is shown in the diagram below.

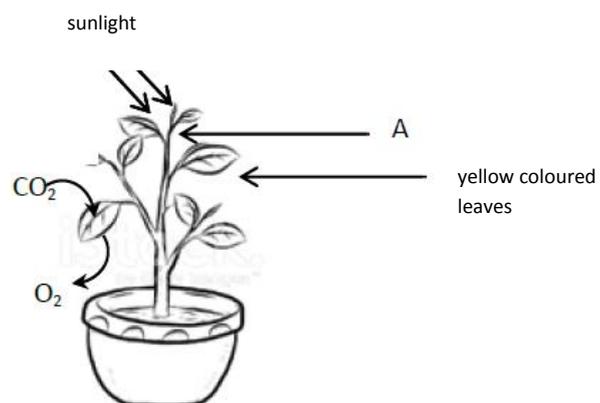


ii) Write two reasons for the deviation of the human population growth from the curve shown above.

iii) The flow of energy in an eco system could be represented by means of an energy pyramid. State a reason why such a pyramid is always upright.

2.

(A) The figure given below shows a biochemical process occurring in plants in the presence of sunlight.



i) Write the main product of the process shown above.

ii) As what substance is the product you stated in (i) above temporarily stored in plant leaves?

iii) What is the type of Meristematic tissue found in the part of the plant shown by A.

iv) Write a benefit received by the plant due to the tissue you stated in (iii) above.

.....

(B)

i) State two simple permanent tissues produced by Meristematic tissues.

.....

.....

ii) Following symptoms were observed when examine a plant.

- Tender leaves were green in colour.
- Matured leaves were yellow in colour.
- The tips of some leaves were dead.

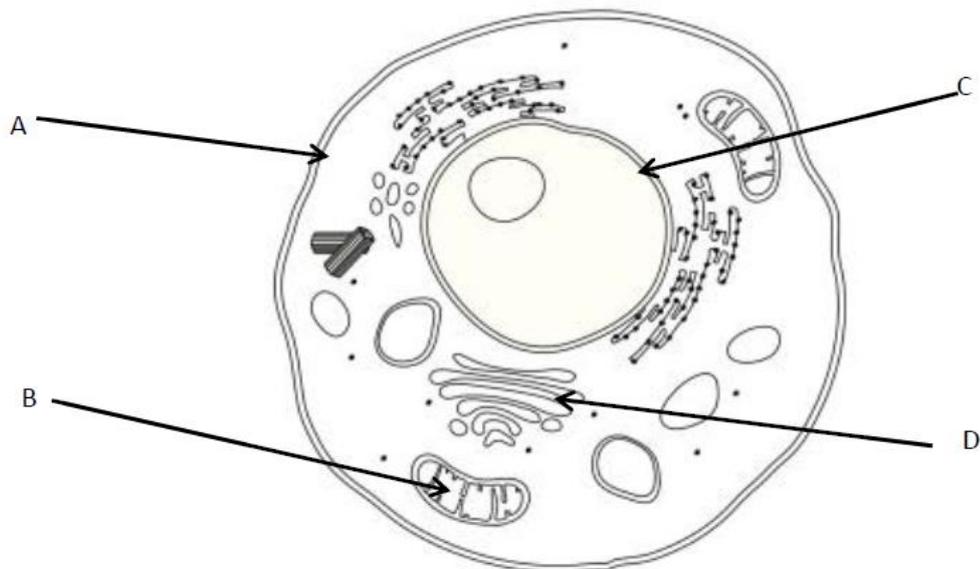
Write two elements whose deficiency causes these symptoms.

.....

iii) Write a chemical fertilizer applicable to decrease the yellow colour of leaves.

.....

(C) Given below is a sketch diagram of the electron microscopic view of an animal cell.



i) What is the organelle that produces energy with the use of oxygen and glucose?

.....

ii) What is the function performed by D?

.....

iii) Biological molecules that determine hereditary characteristics are present in the part shown by C. As which structures are they present in it?

.....

.....

- iv) Write names of two structures that appear in plant cells, but not in animal cells.
.....
- v) What is the name referring to a set of cells assigned to perform a specific function?
.....

3.

(A) A speed reaction occurred producing 'Shoo ... oooo .oo ' sound after a piece of sodium of the size of a grain was put into cold water.

- i) Write two observations that indicate the occurrence of a chemical reaction in this.....
.....
- ii) Write the balanced chemical equation relevant to the reaction between sodium and cold water.
.....
- iii) What are the expected colour changes when inserting following litmus papers into a sodium hydroxide solution?
Red Litmus: Blue Litmus:
- iv) How does the solution of sodium hydroxide affect the rate of corrosion of iron?

(B) Explain the following terms.

- (a) exothermic reactions :
.....
- (b) Endothermic reactions:
.....

- v) State whether the reaction of metal sodium with water is exothermic or Endothermic
.....

(C)

- i) What is the charge of the stable ion formed by the element sodium?
.....
- ii) Write the simplest ratio between the atoms of the compound sodium chloride.
.....
- iii)
 - (a) What is the type of bond present in the compound mention in part (C) ii) above?
.....
 - (b) Write two common features of the compounds with ionic bonds.
.....
.....

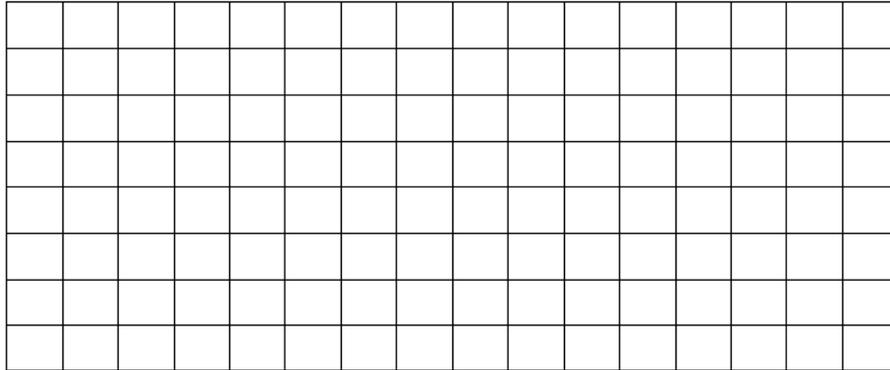
04.

(A) A motor car starting from rest travels along a linear path with a uniform acceleration for 15 seconds. The velocity it gains at the end of the acceleration is 20 ms^{-1} . Then it travels for 55 seconds at that constant velocity. Finally it decelerates due to the application of breaks and comes to rest in 5 seconds.

(Mass of the motor car = 300kg, $g = 10 \text{ms}^{-2}$)

- i. Draw the velocity - time graph relevant to the motion of the motor car.

Draw the graph



- ii. Calculate the acceleration of the motor car during the first 15 seconds.

.....
.....

- iii. What is the magnitude of unbalanced force exerted on the motor car at the above motion?

.....
.....

- iv. Explain the reason why a person in the motor car tends to move forward when applying breaks.

.....
.....

(B) The motorcar stopped on a horizontal path. It could not be restarted to an engine fault. A man tried to push the motorcar forward by applying 500N force on it, but it remained still.

- i) What is the type of frictional force exerted by the road on the tyres of the motorcar?

.....
.....

- ii) What is the magnitude of the frictional force you mentioned in (i) above?

.....

- iii) Additional 500N force was applied in the same direction by another person. Then the motor car moved. What was the resultant of the two forces applied by the two persons on the motorcar?

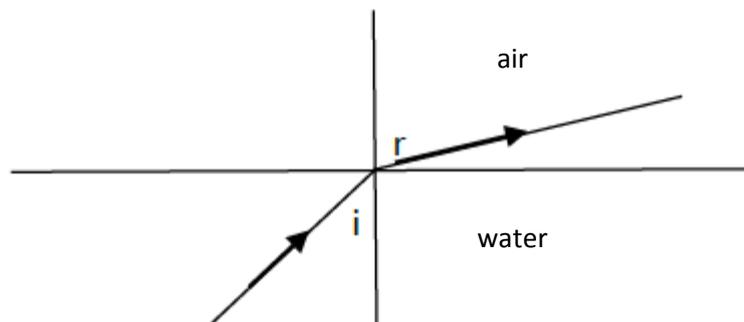
.....
.....
.....
.....

(C) An inverted image of a distant object was seen from a tarred road on a hot sunny day.

- i) State the name of optical phenomenon that produces this inverted image.

.....

- ii) The behavior of a ray of light entering from water to air is shown in the diagram below.



- (a). What is the name used to refer to the angle r when $i = 90^\circ$?

.....

- (b). In which region should the object be placed with respect to a convex lens when it is used as a magnifying lens?

.....

- (c). Draw the relevant ray diagram that shows the formation of the image in ii) (b) above.

Ray diagram

Part B – Essay

05.

(A) A set of children categorized the plants they observed in a field trip to a botanical garden, according to the occurrence of seeds.

- i. Name a plant that bears seeds and a plant that does not bear seeds.
- ii. Mention two differences between monocotyledonous and dicotyledonous plants.
- iii. Write an example each for recombinant DNA technology used in;
 - a. agriculture
 - b. Industries
- iv. Name the bacterium used to produce insulin artificially.

(B) Various diseases are associated with the systems in the human body.

- i. Mention two diseases associated with the digestive system and a preventive measure for each of them.
- ii. Mention a disease associated with the excretory system and a preventive measure.

(C) The blood in the circulatory system or the system of transportation of human body consists of plasma and corpuscles. This system is vital in maintaining the homeostasis of the body.

- i. What is meant by “homeostatis” of the body?
- ii. Name a corpuscle found in human circulatory system and write its function.
- iii. Mention a difference between pulmonary circulation and systematic circulation.
- iv. Write two differences between aerobic respiration and anaerobic respiration.
- v. Name a hormone produced in the pancreas and write its function.

06. The demand for the different types of materials used by man is rising day by day. Crude oil, artificial polymers, natural polymers and salt are a few of them.

(A) Crude oil is a mixture of several components. Byproducts of crude oil processing are used in various industries.

- i. What is the method used to separate the components of crude oil?
- ii. Name a solid component and liquid component found in crude oil.
- iii. Calculate the relative molecular mass of propane gas (C_3H_8) emitted in the method you mentioned in Part (i). (C = 12, H = 1)
- iv. Write the balanced chemical equation of the total combustion of propane.

(B)

- i) Name a polymer produced with the use of glucose and ethane.
- ii) Mention an advantage and a disadvantage of using artificial polymers.
- iii) Write an eco-friendly measure which should be followed when using polymers.
- iv) Draw the structure of chloroethene.

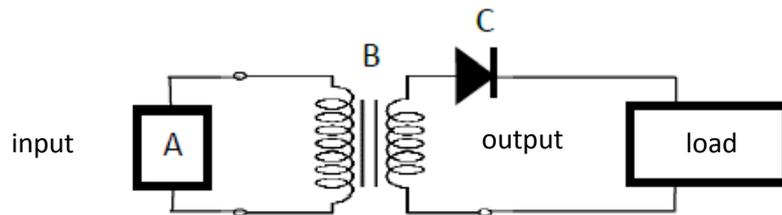
(C) Sodium and chlorine are two elements which are placed in the same period of the Periodic Table.

- i. Write a common feature of chlorine and sodium to be placed in the same period.

- ii. Which of the above elements has the highest first ionization energy?
- iii. Write the electronic configuration of sodium and chloride ions.
- iv. Write a chemical characteristic of each sodium and chlorine elements.

07.

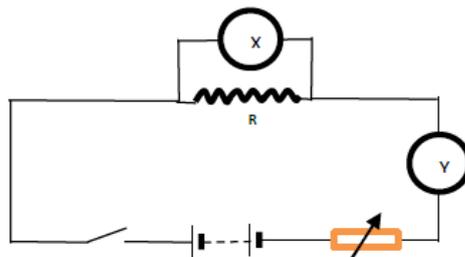
(A) Following is a circuit used for rectification. 'A' in it denotes an electrical source.



- i. Name B and C devices.
- ii. Is it possible to use a direct fluctuating current in this circuit to activate the load? Give reasons for your answer.
- iii. Is there a difference of power in between the output and input when the equipment is operated?
- iv. What is the rate of voltage in between the input and output of the equipment if the number of turns in input is 1000 and that in output is 100.

(B) The main source of energy used in most household is electricity.

- i. Write a difference in between static electricity and current electricity.
- ii. Given below is a circuit used to check the relationship in between voltage (V) and the current (I) which flows through it.



- a. Name the equipment to be used for X and Y.
- b. The data collected from such an experiment is given in the table below.

| | current(I)-A | Potential difference(V)-V |
|---|--------------|---------------------------|
| 1 | 0.2 | 1.5 |
| 2 | 0.4 | 3.0 |
| 3 | 0.6 | 4.5 |
| 4 | 0.8 | 6.0 |

Depict the above data in a graph.

c. Find the resistance (R) with the help of the graph.

(C) Sound transmits energy as mechanical longitudinal waves.

i) Explain how the velocity of a sound wave differs according to the media (gas, solid, liquid) in which it is transmitted .

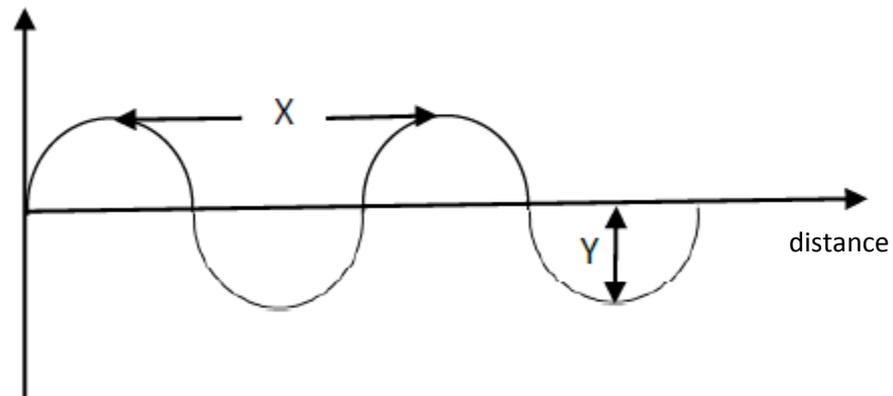
ii) The same note is played with two different musical instruments can easily be distinguished. Which characteristic of sound helps us to do so?

iii)

(a) Name the lengths denoted by X and Y of the following diagram.

(b) Heat radiation is an example for electromagnetic waves. Write two other examples for electromagnetic waves.

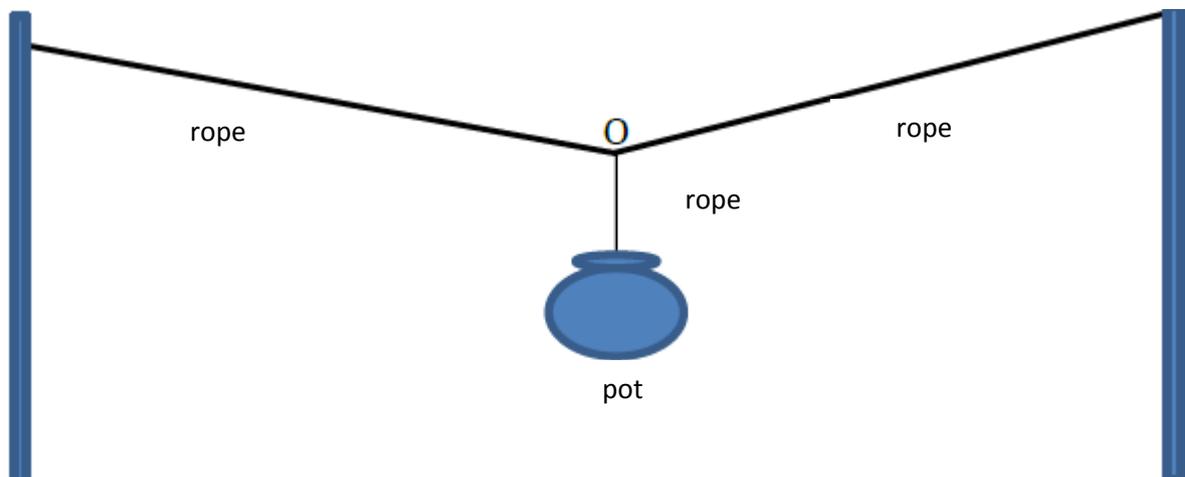
displacement



(a) What is meant by the heat capacity of an object?

(b) Explain the difference in between boiling an evaporation of a liquid.

08. A) The event called “Kanamutti bindeema” (breaking of a water-filled-pot by a blindfolded competitor) has been organized in a certain New Year festival on a bright sunny day. The figure depicts a pot hung by a coir-rope for the event.



i.) Write two requirements that the forces acting on the point O need to meet in order to produce equilibrium.

ii) Draw a diagram to show the forces acting on the point O

iii) A rope and a metal wire of equal initial lengths were connected in a series and the free ends of combination was tied between two trees. It could be seen the metal wire was lowered more than the rope. Explain the reason for this observation.

B) Coir is used for making ropes.

i) Name the simple permanent tissue found in coir.

ii) Draw a labeled diagram to depict the tissue mentioned in (i) above?

iii) State the reason why the competitors find some difficulty to keep their body balance when they are blindfolded.

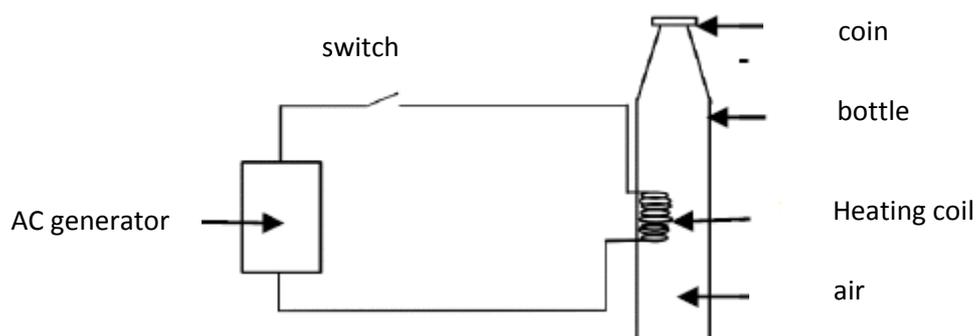
iv) A competitor said that he was dazzled by strong light once the piece of cloth covering his eyes was removed. Explain why he felt so.

v) Write 2 measures taken by the competitor’s body to regulate his/her body temperature on a hot sunny day like this?

C) A copper wire is moved perpendicularly to a magnetic field at high speed.

l) What is the law helping you to find the direction of the induced electromotive force?

ii) The figure given below shows a heating device operated by an alternating current.



Sometime after turning the switch on, the coin was seen slightly raised. Explain this observation.

09) A) In Sri Lanka, salt is produced using the saltern method. As stated below, three kinds of differently sized tanks are used in the production process.

- Large shallow tanks
- Medium tanks
- Small tanks

i) State the substances precipitating in large shallow tanks and in medium sized tanks respectively.

ii) Of the substances you stated in (i) above, which substance is more soluble?

iii) In the small tanks, sodium chloride starts to precipitate. At this instant, the solution is saturated.

a) What is meant by a "saturated sodium chloride solution"?

b) State the measure taken here to minimize the possibility of mixing Magnesium Chloride with sodium chloride.

B) The following procedure was carried out to prepare a sodium chloride solution in the laboratory (relative formula mass of sodium chloride = 58.5)

Step 01 – Measuring out a 29.25g of sodium chloride accurately

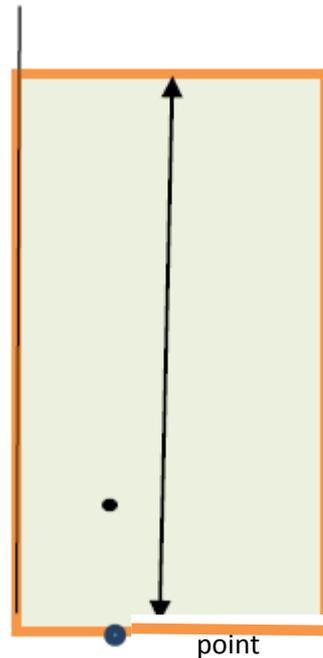
Step 02 – Transferring the measured sodium chloride to a volumetric flask of 250 cm³, adding a small amount of distilled water and dissolving well.

Step 03 – Adding distilled water slowly up to the calibration mark.

i) How many moles of sodium chloride are dissolved in the solution?

ii) What is the concentration of the prepared solution?

C) Refractive index of the prepared solution is 1.4.



i) When viewing right above, a mark at the bottom of a container filled with this solution is seen raised (see fig). Calculate the apparent displacement of the mark.

ii) Draw the correct ray diagram to illustrate the apparent raising of the mark

iii) When the refraction at the water-air interface is taken into account, as which type of medium is water referred to with respect to air?

iv) A spectrum is formed when white light undergoes refraction. State the two colours which show maximum deviation and minimum deviation respectively.

v) The density of the prepared solution has been calculated as 1100kgm^{-3} . When this solution is poured into a glass vessel, the height of liquid level was 0.75 m. Calculate the pressure exerted by the liquid on the bottom of the container. Acceleration due to gravity is 10ms^{-2} .

Answers Structured

1. A

- i) Turn off all the electric appliances connected to the mains. Compare the number of electrical units recorded in the service meter by operating each lamp separately for a fixed amount of time. (2 marks)
- ii) LED lamps are more efficient. (1 mark)
- iii) Able to save electrical energy required for lighting the house/receiving more light /cooling effect produced by convection currents (2 marks)

B.

- i) Introduction of contaminants into the environment that cause adverse effect/Changes occurring in the environment that harms organisms (1 mark)
- ii) Metals such as lead, cadmium, mercury /non degradable materials like plastic and polythene (2 marks)
- iii) Metals such as cadmium, mercury (1 mark)
- iv) By water/through food chains/ through the respiratory system/ by contact (1 mark)

C.

- i) Competition among organisms/diseases/ insufficiency of food(limited food) / conditions produced by parasites (1 mark)
- ii) Decreasing the death rate/increasing the birth rate/ development in the health sector (1 mark)
- iii) Flow of energy occurs only in one direction. (1 mark)

2. A

- i) Glucose / $C_6H_{12}O_6$ (1 mark)
- ii) Starch (1 mark)
- iii) Apical meristem (1 mark)
- iv) Two facts like increasing the height of plant/producing new tissues (1 mark)
- v) Parenchyma/ collenchymas/ sclerenchyma (two of these) (2 marks)
- vi) a) Nitrogen and calcium (2 marks)
- b) Urea/ammonium phosphate/ or a relevant organic manure (1 mark)

B

- i) B or mitochondrion (1 mark)
- ii) Producing secretion/secretory function/ storing secretions (1 mark)
- iii) Chromosomes/DNA (1 mark)
- iv) Cell wall/ large vacuole/chloroplasts (2 marks)
- v) Tissue (1 mark)

3. A.

i) Emission of smoke/fume/ combustion/ emitting light/ getting heated slightly/ producing a shuu sound (2 marks)

ii) $2 \text{Na (s)} + 2 \text{H}_2\text{O (l)} \rightarrow 2 \text{NaOH (aq)} + \text{H}_2\text{(g)}$ (2 marks)

iii) Red litmus turns blue/ No colour change in blue litmus (1 marks)

iv) The rate of corrosion decreases. NaOH is a base, so it's a corrosion inhibitor. (2 marks)

B.

i) If the energy associated with reactants is higher than that with products, the reaction is exothermic. If the energy associated with products is higher than that with reactants, the reaction is endothermic. (2 marks)

ii) Exothermic (1 mark)

C.

i) +1/ unipositive charge (1 mark)

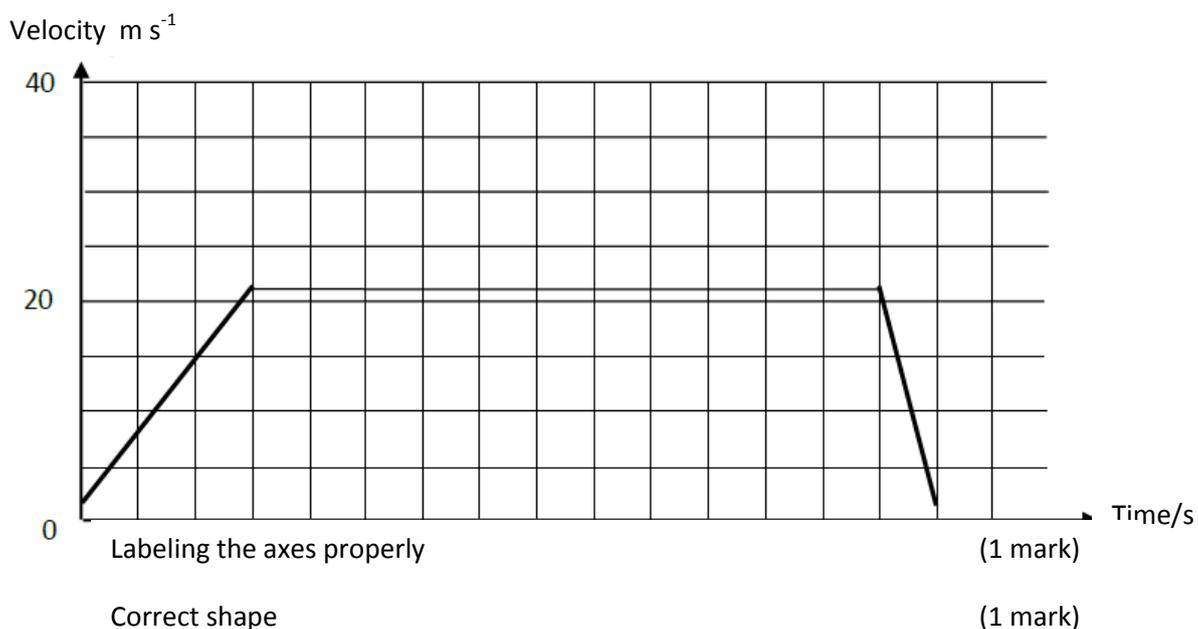
ii) Na:Cl 1:1 (1 mark)

iii) a. ionic/electrovalent (1 mark)

b. conducting electricity when dissolved in water or when fused/high melting point/forming ions / forming ionic lattices

B

4. A. I)



ii) acceleration = $\frac{(20 - 0) \text{ m s}^{-1}}{(15 - 0) \text{ s}}$ 1 mark
 $= 20/15 \text{ m s}^{-2}$
 $= 4/3 \text{ m s}^{-2}$ 1 mark

iii) Unbalanced force on the motorcar $F = m a$
 $= 300 \text{ kg} \times 4/3 \text{ m s}^{-2}$
 $= 400 \text{ N}$ 1 mark

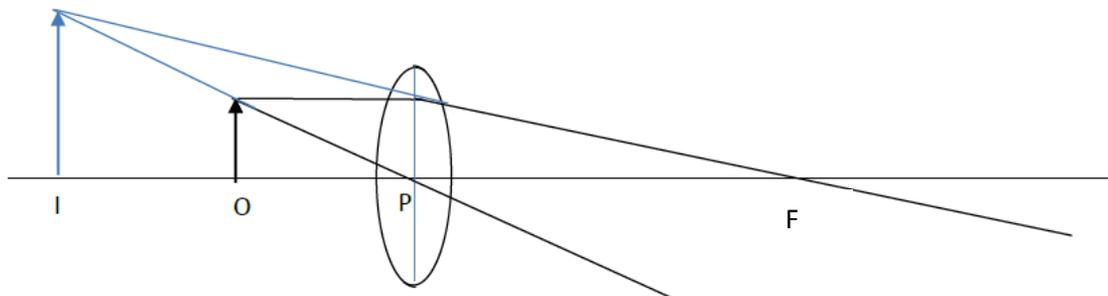
iv) When a vehicle moves forward even the passengers move forward at the same velocity. However on the application of the breaks the vehicle stops and the feet connected with the vehicle too, but the upper part of the body tends to continue its motion since it has no way to get an unbalanced force. (1 mark)

B

- i) static frictional force (1 mark)
- ii) 500 N (1 mark)
- iii) $500 \text{ N} + 500 \text{ N} = 1\,000 \text{ N}$ forward (1 mark)

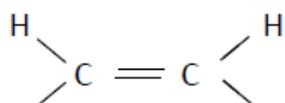
C

- i) Refraction (2 marks)
- ii) Critical angle (1 mark)
- iii) Between the optical centre and the lens (1 mark)
- iv)



Essay

5. A
- i) Producing seeds- cycads/ pinus/Devadara(Deodar) (1 mark)
Not producing seeds-moss/marchantia/ ferns (1 mark)
 - ii) Flower parts/configuration of veins/ secondary growth/ pattern of branching out the stem (For two of these) (2 marks)
 - iii) Agricultural sector-golden rice/crops resistance to insecticide and weedicide /crops that can withstand upon cold conditions/animals producing milk and meat in large extents
Industrial sector-producing enzymes/ artificial amino acids/ antibiotics/vitamins/waste disposal (2 marks)
 - iv) E.coli bacteria (1 mark)
- B
- i) Preventing from gastritis/ dysentery/diarrhea (1 mark)
Keeping the environment and hands clean/ consuming clean food (1 mark)
 - ii) Preventing from formation of kidney stones/ kidney failure (1 mark)
Consuming pure water to the right extent (1 mark)
 - iii) Pneumonia/TB (1 mark)
- C
- i) Maintaining the internal environment constant (1 mark)
 - ii) Red blood cells (erythrocytes) -oxygen transportation
White blood cells(Leucocytes)- counteracting diseases and foreign bodies
Platelets - blood clotting (2 marks)
 - iii) Difference in the extents of carbon dioxide and oxygen in blood (1 mark)
 - iv) Anaerobic respiration produces less energy/producing lactic acid (2 mark)
 - v) Insulin/glucagon-regulating blood glucose level (2 marks)
6. A
- i) Fractional distillation (1 mark)
 - ii) Solid- grease/tar/paraffin (1 mark)
Liquid-lubricating oil/diesel/petrol (1 mark)
 - iii) C_3H_8 relative molecular mass = $12 \times 3 + 1 \times 8 = 44$ (1 mark)
 - iv) $C_3H_8(g) + 5 O_2(g) \rightarrow 3 CO_2(g) + 4 H_2O(l)$ (2 marks)
- B
- i) Glucose-starch/glycogen/cellulose (1 mark)
Ethene-polythene (1 mark)
 - ii) Advantage-low weight/ low cost/water resistant (1 mark)
Disadvantage-non degradable/ environmental pollutant (1 mark)
 - iii) Recycling/ proper waste disposal (1 mark)
 - iv)



marks)

(2

C

- i) Same number of energy levels/shells containing electrons (1 mark)
- ii) Chlorine (1 mark)
- iii) For correct electron configuration (1 mark for each) (2 marks)
- iv) Sodium- oxide being basic (1 mark)
Chlorine- oxide being acidic (1 mark)

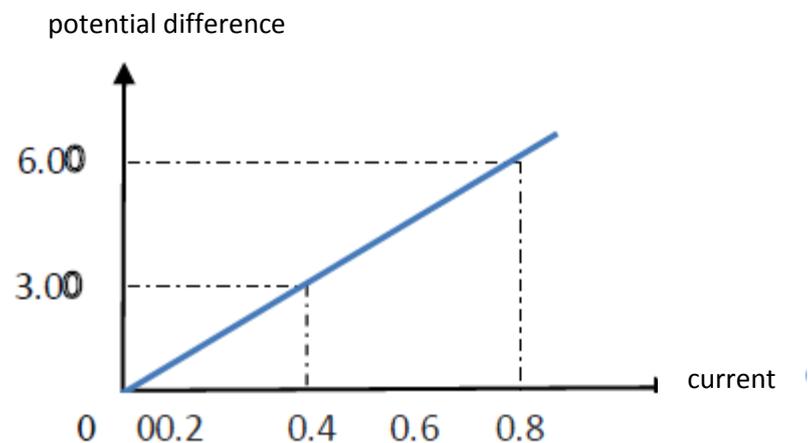
7. A

- i) B-transformer C-diode (1 mark)
- ii) Yes/Although the current is DC, its variation results in change of magnetic flux inducing an e.m.f in the secondary (1 mark)
- iii) If the transformer is ideal (100% efficient) energy is transmitted to the secondary winding at the same rate. If the transformer is not ideal the power generated in the secondary winding is lower than the power in the primary (1 mark)
- iv) $100 : 1000 = 1 : 10$ (1 mark)

B

- i) Electricity due to electric charge at rest is termed static electricity. In current electricity, charge continuously flows. (1 mark)
- ii) a . X- voltmeter Y- ammeter (2 marks)

b.



- Labeling axes correctly (1 mark)
- Correct shape (1 mark)
- c. Obtaining the value using the gradient $(3.0 - 0 / 0.4 - 0)$ (1 mark)

C

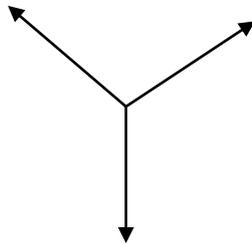
- i) Speed of sound decreases in the order of solid, liquid, gas. (1 mark)
- ii) Quality of sound (timbre) (1 mark)
- iii) a. X – wavelength Y-amplitude (1 mark)
b. radio waves/microwaves/infrared/ visible light/ultra violet/x-rays/gamma rays

- (2 marks)
- iv) a. the amount of energy that raises the temperature of an object by 1 K or (1 °C) (1 mark)
- b. Boiling is the rapid vaporization of a liquid when a liquid is heated to its boiling point or changing of physical state from liquid to gas at every part of the liquid body .
- Evaporation occurs at any temperature only from a surface of a liquid (1 mark)

8. A

- i) The three forces need to be coplanar/ The lines of action of the three forces must meet at a point/ the resultant of any two forces must equal the other force by magnitude and acts in opposite direction. (2 marks)

ii)



(2 marks)

- i) The wire expands more than the coir rope during the day time. (1 mark)

B.

- ii) Sclerenchyma tissue (1 mark)
- iii) For sketching a labeled diagram of Sclerenchyma tissue (3 marks)
- iv) Since the cerebellum does not receive the required nerve impulses from the eye muscle coordination does not occur properly. (2 marks)
- v) Producing sweat /dilation of blood capillaries/ increasing the blood supply to the skin (2 marks)

C.

- i) Fleming's right hand law (1 marks)
- ii) The air is heated by the heating coil. (1 mark)
- As the air expands on heating the coin is raised. (1 mark)

9. A.

- i) CaCO_3 calcium carbonate/ CaSO_4 calcium sulphate (2 marks)
- ii) CaSO_4 calcium sulphate (1 mark)
- iii) a. When a solution contains the maximum amount of a solute dissolved at a certain temperature (1 mark)
- b. removing the mother solution before magnesium salts precipitate or removing crystals before precipitating magnesium salts. (1 mark)

B. i) $29.5/58.5 = 0.5 \text{ mol}$ (2 marks)

ii) $0.5 \text{ mol} / 250 \text{ ml} \times 1000 = 2.0 \text{ mol dm}^{-3}$ (2 marks)

C. i) (Real depth/ apparent depth) = refractive index

$$0.75 / x = 1.4$$

$$x = 0.75/1.4 = 0.535 \times 100 = 53.75 \text{ cm}$$

(1 mark)

Apparent displacement $75 \text{ cm} - 53.75 \text{ cm} = 21.25 \text{ cm}$

- iii) For drawing the incident ray correctly (1 mark)
- For drawing the refracted ray correctly (1 mark)
- For drawing the perpendicular correctly (1 mark)
- Showing the image (1 mark)
- iv) Dense medium (1 mark)
- v) Maximum deviation-Blue (1 mark)
- Minimum deviation -Red (1 mark)
- vi) $H_p g = 0.75 \times 1100 \times 10 = 8250 \text{ Pa}$ (2 marks)

