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இரண்டாம் தவணைப் பரீட்சை - 2024 / Second Term Test - 2024

ශ්‍රේණිය
தரம்
Grade

11

Science - I

කාලය
நேரம்
Time

1 Hour

නම
பெயர்
Name

විභාග අංකය
சட்டிதலக்கம்
Index No.

- Answer all questions.
- In each of the questions 1-40, pick one of the alternatives (1), (2), (3), (4) which you consider is correct or most appropriate.
- Mark a (x) on the number corresponding to you choice in the answer script provided.

01. Of the following, which is the plant belongs to angiosperms?

1. Pinus 2. Water lily 3. Sellaginella 4. Cypas

02. What is the unit of momentum?

1. Kg m s^{-2} 2. $\text{Kg m}^2 \text{s}^{-2}$ 3. Kg m s^{-1} 4. $\text{Kg m}^2 \text{s}^{-1}$

03. A function of cell membrane is,

1. Giving shape to the cell. 3. Transporting substances within the cell.
2. Enclosing the cell. 4. Controlling the biological processes within the cell.

04. Acceleration due to gravity on the moon is $1/6^{\text{th}}$ of that of the earth. Which of the following physical quantities of an object changes when it is on the earth and the moon?

1. Amount of matter 2. Weight 3. Volume 4. Density

05. A stone is thrown vertically upwards with an initial velocity of 20ms^{-1} . What is the maximum height that the stone reaches and the total time taken by it to return to the ground?

1. 20m & 2s 3. 40m & 2s
2. 20m & 2s 4. 40m & 4s

06. What is the element essential to produce thyroxin hormone in the thyroid gland?

1. Potassium 2. Sodium 3. Iodine 4. Calcium

07. If the formula of the sulphate of element M is MSO_4 , what is the formula of its hydroxide?

1. MOH 2. $\text{M}(\text{OH})_2$ 3. M_2OH 4. $\text{M}(\text{OH})_3$

08. Which of the following animals has a body divided into equal segments?

1. Centipede 2. Leech 3. Cockroach 4. Prawn

09. In which part of the female reproductive system does fertilization occur?

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

10. Which of the following molecules contains the atoms that **have not** gained noble gas configuration?

1. AlCl_3 2. NH_3 3. CO_2 4. H_2O

11. An object kept on a rough surface is pulled with a force of **P**. Of the following, which is the factor that **does not** affect its tendency to move or not to move?

1. Reaction exerted on the object 3. Nature of contact surfaces
2. Magnitude of the force P applied on it 4. Surface area of contact surfaces

12. An advantage of grafting is,

1. Daughter plants gain the characteristics of the scion. 3. Short lifespan
2. Daughter plants gain the characteristics of the stock. 4. Low wood value

13. Of the following, which can be an observation of experiments done to test the factors that affect photosynthesis?

1. Changing the colour of iodine at mosaic places of the leaf.
2. Changing the colour of iodine with the leaf covered with the polythene bag with KOH
3. Remaining the colour of iodine unchanged at the mosaic places of the leaf.
4. Remaining the colour of iodine unchanged with leaf covered with the polythene bag with water.

14. Total number of atoms in 44g of CO_2 is, (C = 12, O = 16)

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

15. Several characteristics of muscle tissues are given below.

- A. Voluntary B. Involuntary C. Uninucleate D. Multinucleate

Out of the above, the characteristic/s common only to skeletal muscles is/are,

1. Only A & C
2. Only B & C
3. Only C & D
4. Only A & D

16. Two weights of 4N and X N are hung at the two ends of 6m long light rod as illustrated in the diagram. What is the resultant force exerted on the rod when it is under equilibrium?

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



17. Which of the following enzyme is **not** contained in the juice carried by the pancreatic duct to the duodenum?

1. Trypsin
2. Pepsin
3. Amylase
4. Lypase

18. Select the weak acidic oxide out of those given below.

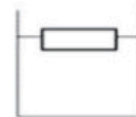
1. SiO_2
2. Al_2O_3
3. SO_3
4. Cl_2O_7

19. Of the following pairs of compounds, which pair contains the compounds with ionic bonds and covalent bonds in respective order?

1. CO_2 & NaCl
2. NaCl & HCl
3. H_2O & HCl
4. HCl & CO_2

20. Which of the following conditions can be possible, when an object floats on a liquid as illustrated in the diagram,

1. Upthrust being greater than the weight of the object.
2. Density of the object being greater than density of the liquid.
3. Density of the substance that the object is made of being higher than the density of the liquid.
4. Weight of the object being greater than the weight of the liquid displaced by the object.



21. What is the correct statement regarding both fungi and algae?

1. Cell wall material being chitin
2. Being prokaryotes
3. Forming symbiotic relationships
4. Being autotrophic due to presence of chlorophyll

22. Select the single displacement reaction out of the chemical reactions given below.

1. $\text{CaCO}_3 \longrightarrow \text{CaO} + \text{CO}_2$
2. $2\text{Ag}_2\text{O} \longrightarrow 4\text{Ag} + \text{O}_2$
3. $2\text{KBr} + \text{Cl}_2 \longrightarrow 2\text{KCl} + \text{Br}_2$
4. $2\text{H}_2\text{O}_2 \longrightarrow 2\text{H}_2\text{O} + \text{O}_2$

23. When 0.2g of manganese dioxide is added to 5ml of fresh hydrogen peroxide (H_2O_2) in a test tube, gas bubbles evolved fast. When emission of gas bubbles ceased, the remnants in the test tube was filtered and dried. What can be the mass of the dried remnant?

1. 0.2g
2. Less than 0.2g
3. More than 0.2g
4. Cannot be stated precisely.

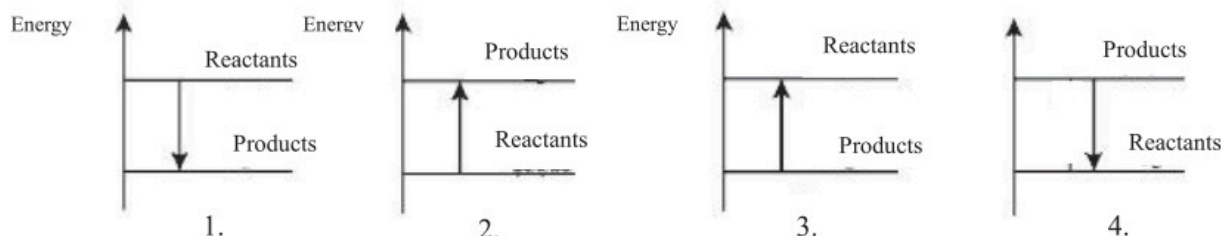
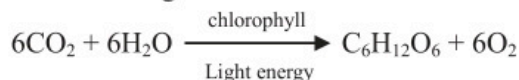
24. What is the blood vessel with highest concentration of oxygen?

1. Pulmonary artery
2. Inferior vena cava
3. Pulmonary vein
4. Superior vena cava

25. Images formed by concave mirrors are,

1. Always virtual
2. Always formed behind the mirror
3. Inverted only when they are real
4. Always larger than the object

26. The balanced chemical equation for the process of photosynthesis is given below. Which energy diagram correctly depicts the heat change associated with that reaction?



27. Which of the following statements is true regarding the pattern of inheritance of hemophilia to the children born to a hemophiliac carrier mother and a healthy father?

1. There can be a carrier daughter among the children born.
2. None of the daughters born show symptoms of the disease.
3. All the sons born are victims of the disease.
4. 50% of the sons born should compulsorily be victims of the disease.

28. When a sound wave emitted by a loudspeaker propagates in air, its

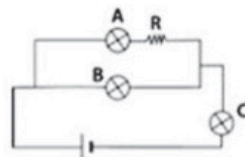
1. Frequency decreases
2. Velocity decreases
3. Wavelength decreases
4. Amplitude decreases

29. The indicator suitable to separately identify KOH and NH_4OH is,

1. pH paper
2. Methyl orange
3. Litmus
4. Phenolphthalein

30. The diagram illustrates how three identical bulbs A, B and C and resistor R are connected to a circuit. The bulb/s with least resistance is/are,

1. A & B
2. B & C
3. A
4. B



31. What is the separating technique used for separating a mixture with two or more volatile components?

1. Simple distillation
2. Steam distillation
3. Chromatography
4. Fractional distillation

32. Select the option that contains two liquids that conducts electricity and a liquid that does not conduct electricity?

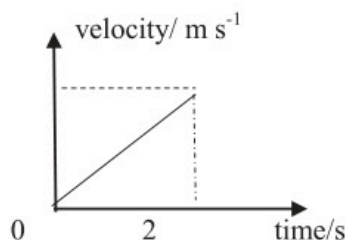
1. Sugar solution, distilled water, dilute acids
2. Sugar solution, salt solution, acid solution
3. Sugar solution, salt solution, dilute acids
4. Distilled water, acid solution, sugar solution

33. Select the **false** statement regarding virus.

1. They have both DNA and RNA.
2. They possess a protein capsule.
3. They behave as organisms only when they are in living host cells.
4. They do not perform any metabolic function.

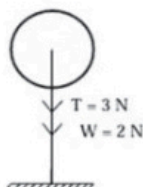
34. The velocity -time graph drawn for motion of a coconut with the mass of 2kg attached to the tree till it falls on the ground is given below. Gravitational acceleration is 10ms^{-2} . What is the kinetic energy of the coconut at the moment that it strikes the ground?

1. 40J
2. 400J
3. 20J
4. 800J



35. A hydrogen gas filled balloon is tied with a string as shown in the diagram. What is the upthrust exerted on the balloon?

1. 2N
2. 1N
3. 3N
4. 5N



36. What can happen when a piece of iron with the mass of 5g kept in a refrigerator is put in to a beaker with 50cm^3 of water at 25°C ?

1. Temperature of both water and piece of iron decrease
2. Temperature of water reaches the temperature of piece of iron
3. Temperature of piece of iron increases up to the temperature of water.
4. After a short while, the temperature of both piece of iron and water becomes equal.

37. What is the hormone that stimulate the growth of uterus wall during the proliferation stage of menstrual cycle?

- | | |
|---------------------------------|-------------------------|
| 1. Luteinizing Hormone | 3. Progesterone Hormone |
| 2. Follicle Stimulating Hormone | 4. Oestrogen Hormone |

38. Select the common feature of all the three compounds; NaHCO_3 , $\text{Ca}(\text{OH})_2$ and NH_3 .

- | | | | |
|-------------------------|-------------------|----------------|-------------------|
| 1. Being at solid state | 2. Being alkaline | 3. Being ionic | 4. Being covalent |
|-------------------------|-------------------|----------------|-------------------|

39. Select the instance in which a couple of forces **is not** exerted.

- | | |
|--|--|
| 1. Closing a water tap | 3. Removing a bolt nail with a spanner |
| 2. Removing a nail with a screw driver | 4. Rotating the steering wheel |

40. Of the following, which is the human activity that mostly caused instant floods in several areas of Sri Lanka in recent times?

- | | |
|---------------------|----------------------------------|
| 1. Use of polythene | 3. Irregular constructions |
| 2. Deforestation | 4. Irregular disposal of garbage |



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ශ්‍රේණිය
தரம்
Grade

11

Science - II

කාලය
நேரம்
Time

3 Hours

නම
பெயர்
Name

විභාග අංකය
சட்டிலக்கம்
Index No.

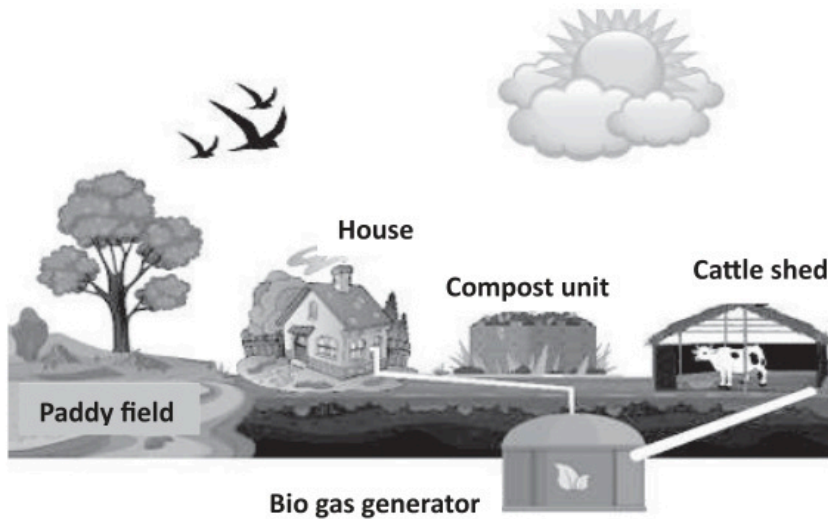
Instructions:

- Additional reading time - 10 minutes

- Write your answer *in neat 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 over.

Part A – Structured Essay

01. (A) The pictures given below shows a home garden in the countryside.



- As you think, what are the two main nutrients that can be present in meals of residents of this house?
- Mention a heterotrophic organism that can be seen in this picture.
- Mention two characteristics present in animals that can be seen in the picture.
.....
.....
- The bio gas unit has a mixture of gases. What is the main gas found in it?
.....
- Bio gas produced by the bio gas unit is used for cooking. Write down the balanced chemical equation for combustion of fossil fuel.
.....
.....

- vi. Certain product of bio gas combustion is useful for a biological process in plants. Name that product and the biological process that it is used for.
.....
- vii. Mention another method that above product is released to the atmosphere other than combustion of fossil fuel.
.....
- viii. What is the environmental issue caused by increasing the percentage of above product beyond its optimum level in the atmosphere?
.....
- ix. Mention two groups of microorganisms important for production of compost.
.....
- x. Mention a type of energy that can be used for cooking based on the picture.
.....
- xi. What is the renewable source of energy that can be used for generating electricity necessary for the house?
.....

02. (A) Select an organism that matches with each of the statements given in the table from the list given below.

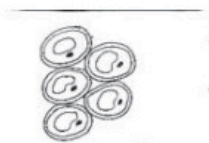
***Chlamydomonas*, *Paramecium*, cockroach, leech, sea urchin, *Hydra*, *Porganatum*, *Cycas*, paddy, frog**

i.	Unicellular, photosynthetic organism	
ii.	Seeded, non-flowering plant	
iii.	Presence of tube feet	
iv.	A vertebrate	

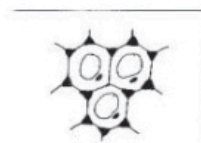
(B) Different types of cells that are modified to do different functions in plants and animals are given below.



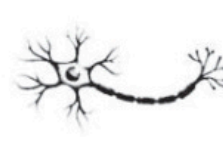
A



B



C



D

- i. (a) Name the plant cell/s out of the above types of cells.
.....
(b) How did you identify that the cell/s you mentioned in (a) above are plant cells.
.....
- ii. What is the tissue that bears the cell type C?
.....
- iii. What is the main function done by the tissue that bears cell type B?
.....
- iv. What is the unique feature of the tissue with cell type A?
.....



(C) A set -up arranged to test for a factor that affects photosynthesis is given below.

- What factor affecting photosynthesis is test by the set-up?
.....
- When the set -up is kept in sunlight for several hours and the leaf in polythene bag C is tested for starch, what can be the colour change?
.....
- What is the reason for adding KOH in polyethene bag D?
.....
- Which factor affecting photosynthesis cannot be tested in a general laboratory?
.....
- Due to what reason that the factor you mentioned in (iv) above cannot be tested in a general laboratory?
.....



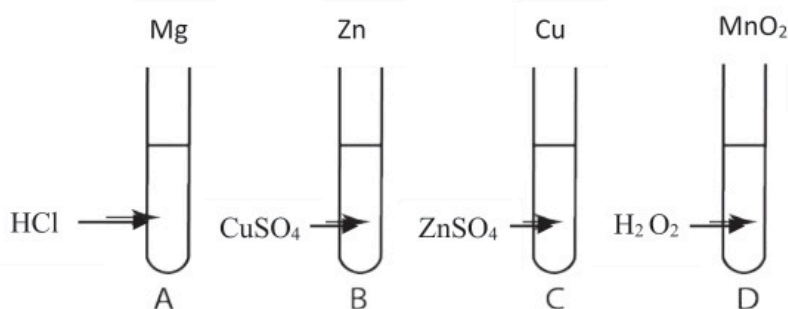
03. (A) The elements belonged to second period of the periodic table are given below. But they are not in the sequential order.

F	Ne	N	O	C	Be	B	Li
---	----	---	---	---	----	---	----

- Select the element that matches with each of the statements given below and write the symbol of them on the dotted line provided against the statements.
 - Element with highest electronegativity -
 - Element with lowest first ionization energy -
 - Diatomic gas with a triple bond between the atoms. -
- (a) Write down a characteristic of the compound formed between Lithium and Oxygen.
.....
(b) Is that compound acidic or basic?
- Draw the dot- cross diagram of the compound formed between element N and H in the box provided below.
- Write down the formula of the sulphate of Be.
.....



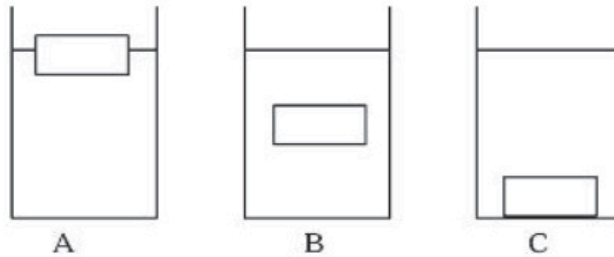
(B) The test tubes A, B, C and D contain different chemicals and Mg, Zn, Cu and MnO₂ added to them as illustrated below.



- Answer the questions given below considering the chemical reactions that take place in test tubes.
 - In which tube does a colour change take place?
 - In which test tube does a decomposition reaction take place?
 - In which test tube does a precipitate form?

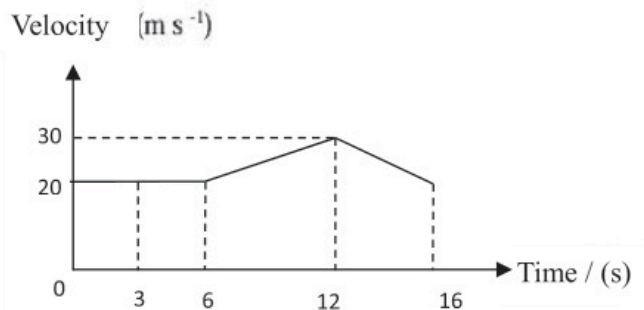
- d) In which test tube/s does/ do gas bubbles emit?
- e) Which test tube can be used for demonstrating the effect of catalysts on chemical reactions?
.....
- f) What is the test tube that evidence for a chemical reaction cannot be observed?
.....
- g) Write down the balanced chemical equation for the reaction takes place in test tube B.
.....

04. (A) The diagram given below illustrates how three objects with equal volume partially immersed and floats, fully immersed and floats and sinks in a liquid.



- i. What are the instances that weight of the object and upthrust exerted on the object are equal?
.....
- ii. In which instance is the density of the object and density of the liquid being equal?
.....
- iii. What are the instances that upthrust exerted on the object are equal?
.....
- iv. What are the factors that affect the upthrust exerted by a liquid on an object fully or partially immersed in it?
.....

(B) A velocity – time graph related to the motion of a motor car along a straight part of an express way is given below.



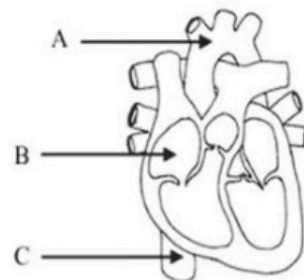
- i. What is the initial velocity related to this motion?
- ii. How far has the motor car travelled in uniform velocity?
.....
- iii. In which period of motion has the resultant force exerted on the object become zero?
.....
- iv. If the mass of the motor car is 2000 kg, what is the unbalanced force exerted on it during the period 6s - 12s?
.....
- v. What is the momentum of the motor car at 16s?
.....



Part – B

- Answer only three questions.

05. (A) Longitudinal section of the human heart is given below.



- Name the parts A, B and C.
- Mention a structural difference between the arteries that carry blood out of the heart and veins that carry blood towards the heart.
- Name the valve/s that get open during contraction of ventricles.
- During gaseous exchange takes place in lungs, oxygen is absorbed into into blood and carbon dioxide in blood is released.
 - In which part of the lungs does gaseous exchange take place?
 - Write down two adaptations found there for efficient gaseous exchange.
 - Name the blood vessel/s that carry oxygenated blood towards heart.

(B) The process of breakdown of complex organic molecules into simpler organic molecules that can be absorbed is known as food digestion.

- In which part of the digestive system does food digestion begin?
- Name two enzymes secreted by the wall of small intestine for food digestion.
- Where does absorption of digestive end products mainly take place?
- Write a structural adaptation in the part you mentioned in (iii) above for efficient absorption.
- Name two digestive end products that are **not** directly absorbed into blood.

(C) The process of removal metabolic waste products from the body is known as excretion.

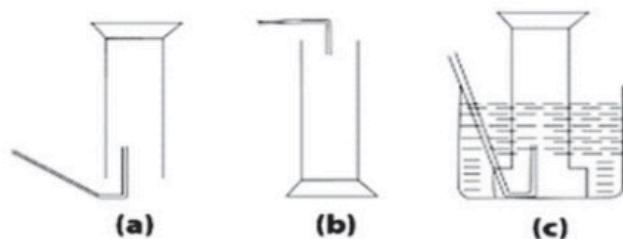
- Name the structural and functional unit of the main nitrogenous excretory organ.
- Name two substances that are completely reabsorbed into blood from glomerular filtrate.
- Name an organ contributes for excretion other than the kidneys.

06. (A) A group of students prepared a solution of sodium chloride by dissolving 117g of NaCl in 500cm³ of water during their lesson on preparation of standard solutions.

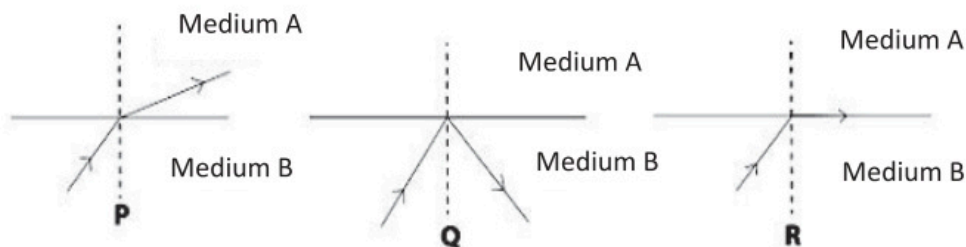
- (a) What kind of solution have the students prepared according to its composition?
 - (b) Explain the answer you provided in (i) a)
- (a) Calculate the number of moles of NaCl in the solution. (Na = 23, Cl = 35.5)
 - (b) Express the concentration of the solution in mol dm⁻³.
- Mention two separation techniques that can be used for separation of sodium chloride from the solution again.
- When a mixture contains a volatile component and a non- volatile component, simple distillation method is used as the separation technique to separate those components. Draw a labeled diagram of a set-up prepared in the school laboratory to demonstrate this separation technique.



(B) Three set -ups arranged to collect gases produced in the laboratory are given below.



- i. Name the three methods of collection of gases in a, b, and c set -ups.
 - ii. (a) Name the set- up/s that can be used for collection of a sample of hydrogen gas.
(b) Which properties of hydrogen gas make it possible to collect the gas by the set -ups you mentioned above? State them separately.
 - iii. If Zn and HCl are used for preparation of hydrogen gas, write down the balanced chemical equation for the reaction takes place.
 - iv. Mention a usage of hydrogen gas.
- 07. (A)** When the length of the same string of a guitar is changed, sounds waves with different frequencies can be produced.
- i. What kind of mechanical waves can be generated by vibration of strings of a guitar?
 - ii. If to generate a sound wave with higher pitch, should the length of the strings of the guitar be increased or decreased?
 - iii. Write down a difference between a sound wave and an electromagnetic wave.
 - iv. Reflection of sound waves is used for measuring the depth of the sea. A ship that carries out ocean exploration uses a sound wave with the frequency of 30000Hz for this purpose.
 - a) Can this sound wave be heard by the human ear?
 - b) Give reasons for your answer.
 - c) If the velocity of sound in sea water is 1500ms^{-1} , what is the wavelength of sound wave used for ocean exploration?
 - d) If the sound wave took 10s to reach back the ship after its emission from the ship, calculate the depth of the ocean.
 - e) What kind of electromagnetic waves used by the ship for transmission of messages between the ship and the land?
- (B) Three instances where light subjects to refraction when light travels from one medium to another are depicted in the ray diagrams given below.



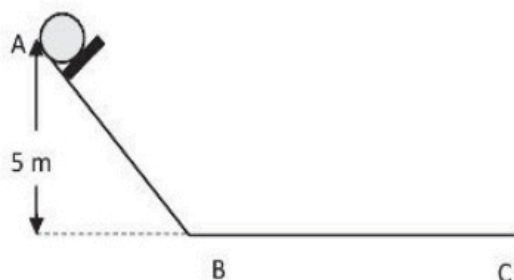
- i. Name the media A and B according to speed of light.
- ii. In which instance is the critical angle depicted out of instance P, Q and R?

- iii. Name an instance where phenomenon occurs in Q is made use in day-to-day life.
- iv. Does refraction or reflection occur during formation of images of objects by lenses?
- v. An object is kept on the principal axis at 3cm away from a convex lens with the focal length of 5cm.
 - a) Draw the ray diagram for the formation of the image of the object.
 - b) Write down two features of the image formed.
 - c) Give an example for an instance where above type of image is obtained in day- to- day life?

08. (A) Plants carry out sexual as well as asexual reproduction in order to produce offspring.

- i. Mention two natural asexual reproduction methods of plants.
- ii. Give an advantage and disadvantage of tissue culture which an artificial asexual reproduction method of plants.
- iii. Plants produce seeds during their sexual reproduction.
 - a) Which part of the flower becomes the seed?
 - b) Write down an adaptation found in seeds that get dispersed by wind.
- iv. Menstrual cycle that takes place in the female reproductive system contributes significantly for the sexual reproduction in humans.
 - a) What is the process that occurs in the ovary on the 14th day of the menstrual cycle?
 - b) Which hormone stimulates that process?
 - c) What is the phase of the menstrual cycle in the uterus when the above process occurs in the ovary?
 - d) Implantation is an important phenomenon that takes place in the female reproductive system after fertilization. What is meant by implantation?
 - e) Mention two sexually transmitted diseases caused by bacteria.

(B) The diagram given below illustrates how an iron sphere with the mass of 2kg is placed on a smooth inclined plane which is 5m above the ground level.



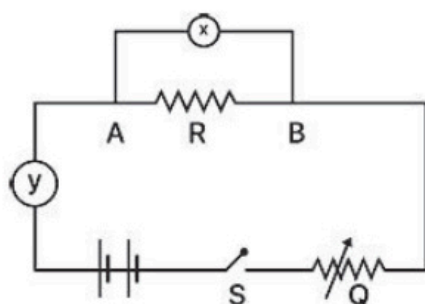
- i. How much is the potential energy of the iron sphere?
- ii. Find out the velocity at which the iron sphere reaches point B when the supporter of the sphere is removed.
- iii. A uniform frictional force of 5N is exerted on the sphere in section BC. It takes 2s to reach point C from point B.
 - a) What is the velocity of the sphere when it reaches point C?
 - b) Which Newton's law can be applied to describe the motion of the sphere in the BC section?
 - c) How much is the amount of work done on the sphere by the frictional force?



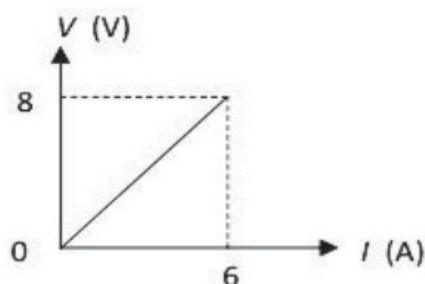
09. (A) When water is added to quick lime, slaked lime can be prepared.

- Write down the balanced chemical equation for the chemical reaction related to production of slaked lime.
- What kind of chemical reaction is it?
- Certain gas is identified by introducing it to a solution prepared by dissolving slaked lime in water. Write down the observation that is relevant for identification of that gas.
- When water is added to quick lime, the temperature of the mixture goes up. What is the reason for rising the temperature?
- Depict the heat change associated with the above chemical reaction in an energy level diagram.
- Why is slaked lime considered as a weak base?
- Write down an application of slaked lime in day – to – day life.
- Write down in brief how quick lime is produced industrially.

(B) A diagram of a circuit prepared to find out the relationship between current flowing in a conductor and the potential difference between the terminals of that conductor is given below.



- Name the devices x and y used in the circuit.
- Which physical quantity of the circuit is changed by device Q?
- What is the relationship between the readings obtained from devices x and y.
- Which physical quantity should be kept constant during the experiment?
 - Describe in brief the procedure followed to keep the above-mentioned quantity constant.
- The graph drawn with the readings obtained from the above experiment is given below.



- Calculate the resistance of the nichrome coil used in the circuit.
- How will the above value of resistance change if a nichrome coil with greater area of cross section and same length as in the coil used in the circuit is used instead of the one used in the circuit?

