

දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
தென் மாகாணக் கல்வித் திணைக்களம் தென் மாகாணக் கல்வித் திணைக்களம் தென் மாகாணக் கல்வித் திணைக்களம்
Department of Education, Southern Province Department of Education, Southern Province Department of Education, Southern Province
தென் மாகாணக் கல்வித் திணைக்களம் தென் மாகாணக் கல்வித் திணைக்களம் தென் மாகாணக் கல்வித் திணைக்களம்
Department of Education, Southern Province Department of Education, Southern Province Department of Education, Southern Province

අවසාන වාර පරීක්ෂණය - 2024 (2025)

இறுதி தவணைப் பரீட்சை - 2024 (2025) / Year End Term Test - 2024 (2025)

ශ්‍රේණිය
தரம்
Grade

Grade 11

Science - I

කාලය
நேரம்
Time

1 Hour

නම
பெயர்
Name

.....

විභාග අංකය
சட்டிலக்கம்
Index No.

.....

- Answer all questions.
- Each question from question number 1 – 40 are provided with four alternatives as (1), (2), (3) and (4). Select the accurate or the most appropriate answer for each question out of the alternatives given.
- Mark a cross (X) on the circle bearing the number of the alternative you selected as the answer for each question in the answer script provided to you.

- What is the animal phylum with exclusively marine members having radial symmetry?
1. Mollusca 2. Cnidaria 3. Echinodermata 4. Annelida
- Which of the following plants produce new plants by underground stems?
1. Pineapple 2. Red onion 3. Sweet potato 4. *Cyperus rotundus* (Kalanduru)
- The Standard International unit of measuring temperature is,
1. k 2. K 3. ⁰ K 4. ⁰ k
- The main function of the vacuole in plant cells is,
1. Production of secretory materials 3. Giving shape to the cell
2. Transportation of substances within the cell 4. Storage of water, sugar, ions and pigments
- A similarity between both the Domains Archaea and Bacteria is,
1. Being able to be destroyed by antibiotics 3. All being prokaryotes
2. Being able to be seen in all kinds of environments in the Earth 4. All being heterotrophs
- In a horizontal ground, point B is located west to point A and point C is located east to point A. An object moves from A to B and it moves back to C and stops there. If AB = 6 m and AC = 10 m, what is the displacement of the object related to this motion?
1. 10 m towards west 2. 22 m towards west 3. 22 m towards east 4. 10 m towards east
- In hepatic portal vein comparative to the hepatic artery,
1. Oxygen concentration is higher and nutrient content is less.
2. Oxygen concentration is less and nutrient content is higher.
3. Both oxygen concentration and nutrient content are higher.
4. Both oxygen concentration and nutrient content are less.
- If the formula of the sulphate of metal M is MSO₄, what is the formula of its hydroxide?
1. M(OH)₂ 2. MOH 3. M₂OH 4. MOH₂
- Which enzyme in pancreatic juice is important to digest the main nutrient contained in egg white?
1. Peptidase 2. Pepsin 3. Trypsin 4. Lipase
- Sulphuric acid which is a strong acid ionizes in water. How many cations are added by the acid to a cubic decimeter of an aqueous solution of H₂SO₄ with the concentration of 0.5 mol dm⁻³?
1. 0.5 x 6.022 x 10²³ 2. 1.0 x 6.022 x 10²³ 3. 1.5 x 6.022 x 10²³ 4. 3 x 6.022 x 10²³

11. Of the following, which is the alternative that correctly provides the name of the tissue illustrated below and one of the characteristics that helped in identification of the tissue?

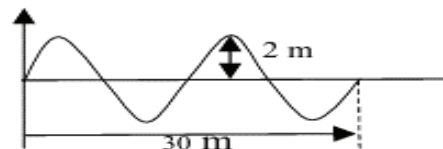
	Tissue	Characteristic
1	Xylem	Presence of tracheid
2	Xylem	Presence of fibers
3	Phloem	Presence of sieve plate
4	Phloem	Presence of vessel elements



12. Of the following, in which instance does a real image form?
- When convex mirrors are used as rear-view mirrors of vehicles
 - When a hand lens is used as a magnifying glass
 - When a concave mirror is used for getting an enlarged image of a tooth in dentistry.
 - When a convex lens is used for obtaining an image of a distant object on a wall.
13. What is the endothermic reaction out of those given below?
- Combustion of fossil fuel
 - Neutralization during acid – base reactions
 - Cellular respiration
 - Photosynthesis
14. Having purple colour petals is the dominant character in Garden Pea plants. Select the answer that gives the type of hybridization that should be done and the result that is given by it to verify that a plant with purple flowers is a homozygote for that particular character.

	Hybridization	Result
1	Purple flowers x purple flowers	All plants are having purple flowers
2	Purple flowers x white flowers	All plants are having purple flowers
3	Purple flowers x purple flowers	50% of plants are having purple flowers
4	Purple flowers x white flowers	3 purple flowered plants: 1 white flowered plant

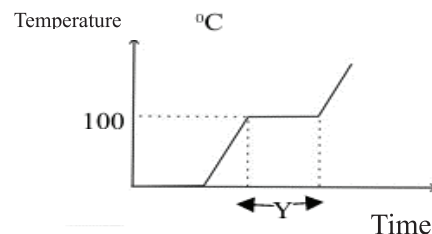
15. The characteristics of sound that change due to change of its amplitude and frequency in respective order are,
- Loudness and quality of sound
 - Quality of sound and loudness
 - Loudness and pitch
 - Pitch and quality of sound
16. The initial photosynthetic product of a paddy plant changes into different other compounds till its storage in seeds. The correct sequence of compounds that form from production to storage is,
- Glucose, starch, sucrose, starch
 - Glucose, sucrose, starch, sucrose
 - Glucose, starch, sucrose, glucose
 - Glucose, sucrose, glucose, starch
17. The function of the miniature circuit breakers (MCBs) of the domestic electric circuit is,
- Protection of the electric meter
 - Protection of domestic circuit.
 - Protection from electric shocks
 - Protection of the isolator
18. Examples for alkanes and alkenes in respective order are,
- C_2H_6 and C_3H_8
 - C_2H_4 and C_3H_8
 - C_2H_6 and C_2H_4
 - C_2H_4 and C_2H_6
19. Which of the following compounds is an ionic compound?
- CaO
 - NH_3
 - $AlCl_3$
 - CO_2
20. Urea and uric acid which are the nitrogenous excretory products in human are produced in the
- Kidney
 - Liver
 - Pancreas
 - Nephrons
21. The position of a transverse wave on water surface at a certain moment is illustrated below. If this portion of wave is formed within 4 s, its frequency and speed in respective order are,
- 2 Hz and 15 m s^{-1}
 - 2 Hz and 60 m s^{-1}
 - 0.5 Hz and 30 m s^{-1}
 - 0.5 Hz and 7.5 m s^{-1}



22. The elements that are always present in a nucleic acid are,
- C, H, O and N
 - C, H, O and P
 - C, H, O, N and P
 - C, H, O, N and S

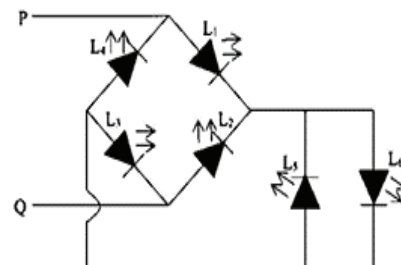
23. The graph illustrates how temperature of 1 kg of water changes when heat is supplied to it. What is called amount of heat absorbed by water during the period Y?

1. Boiling point of water
2. Specific heat capacity
3. Specific latent heat of fusion
4. Specific latent heat of vaporization



24. A rectifier circuit prepared by a student with six identical LED bulbs is shown in the diagram. Of the following which can be the observation, when this circuit is connected to a bicycle dynamo and slowly rotated it?

1. The LEDs L_1 , L_6 , L_3 and L_2 , L_6 , L_4 light up alternatively.
2. The LEDs L_1 , L_2 , L_3 , L_4 and L_6 light up continuously.
3. Only L_5 and L_6 light up
4. All LEDs in the circuit light up.



25. The observations taken during an activity to identify three solutions X, Y and Z are given in the following table. Accordingly, the solutions X, Y and Z in respective order is,

1. HCl, NaCl, NaOH
2. NaCl, HCl, NaOH
3. NaOH, H_2O , HCl
4. HCl, NaCl, H_2O

Test Solutions	Adding Mg	Adding phenolphthalein	Adding methyl orange
X	Evolving H_2 gas	Colourless	Red
Y	No evolution of gases	Colourless	Yellow
Z	No evolution of gases	Pink	Yellow

26. Several requirements for equilibrium of an object under three forces are given below.

- A. – Three forces should be coplanar.
- B. – The lines of action of the three forces should meet at a point.
- C. – The sum of any two forces should be equal in magnitude and opposite in direction to the remaining force.

The correct statement/s regarding equilibrium of an object under three inclined forces is/are,

1. Only A and B
2. Only A and C
3. Only B and C
4. All A, B, C

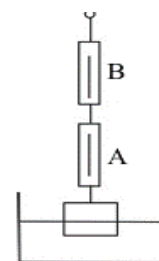
27. Two identical spring balances A and B calibrated in Newtons, each having the weight of 2 N are fixed with each other as illustrated in the diagram. Then the end of the spring balance A is fixed with a mass of 3 kg which is fully immersed and floating in the way that it is half immersed in water.

The readings of spring balances A and B in respective order are,

1. 15 N and 15 N
2. 15 N and 17 N
3. 30 N and 30 N
4. 30 N and 32 N

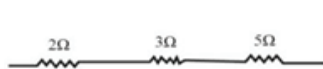
28. As illustrated in the diagram, four drops namely A, B, C and D are kept on a sheet of iron. If drops; A – salt solution, B – lime juice, C – NaOH and D – coconut oil, what are the places where corrosion of iron can be observed after two days?

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

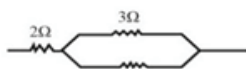


Iron sheet

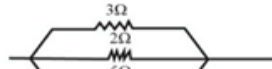
29. Three circuits prepared with three resistors of $2\ \Omega$, $3\ \Omega$ and $5\ \Omega$ are illustrated below. The descending order of equivalent resistance of the three circuits is,



A



B



C

1. B, A, C

2. A, C, B

3. C, B, A

4. A, B, C

30. How much is the mass of NaOH that should be measured in order to prepare 0.5 dm^3 of NaOH solution with the concentration of 2 mol dm^{-3} ? (Na = 23, O = 16, H = 1)

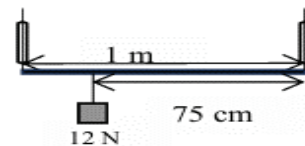
1. 40 g
2. 4 g
3. 0.04 g
4. 400 g

31. Which of the following molecules has an atom with more than eight electrons in the valence energy level?

1. AlCl_3
2. PCl_5
3. HCl
4. NaCl

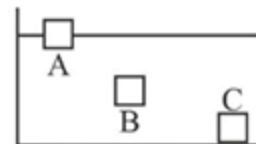
32. The diagram given below illustrates a how a load of 12 N fixed to a light rod is hung with two spring balances P and Q. The readings of the spring balances P and Q in respective order are,

1. 3 N and 9 N
2. 9 N and 3 N
3. 10 N and 2 N
4. 2 N and 10 N



33. The diagram shows how three objects equal in volume but made of three different materials are in same liquid. Of the following, what is the **incorrect** statement regarding them?

1. Upthrust exerted on B is equal to the upthrust exerted on C.
2. Weight of B is equal to upthrust exerted on it.
3. The weight of A and B are equal.
4. Upthrust exerted on A is less than upthrust exerted on B.



34. Metal tin is applied on the surface of food containers made of iron. Which of the following is **not** an objective of aforesaid process?

1. To make it decay faster after disposal.
2. To prevent the food materials, react with the container.
3. To protect the metal container from rusting.
4. To reuse the container over long period after using it once.

35. The diagram shows how a person is standing in an electric escalator. Normal reaction force exerted on the man becomes maximum when the escalator is,

1. Stationary
2. Moving at uniform velocity
3. Moving up with decreasing speed
4. Moving up with increasing speed.



36. Which of the following statement is true regarding catalysts?

1. Small amount of catalyst is sufficient for large quantity of reactants.
2. Catalysts are reaction specific.
3. Physical state of catalysts may change when the reaction is progressing.
4. Chemical nature of catalysts may change when the reaction is progressing.

37. An object is dropped from a tower with the height of 20 m. Find out the velocity of the object at the moment when it falls on the ground. Air resistance in the place is negligible. ($g = 10 \text{ m s}^{-2}$)

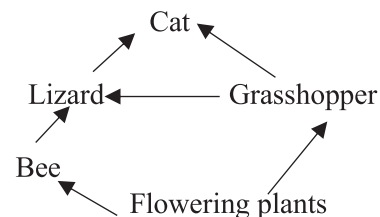
1. 10 m s^{-1}
2. 15 m s^{-1}
3. 20 m s^{-1}
4. 25 m s^{-1}

38. Of the following, which is the instance that **does not** use electromagnetic induction?

1. The bank cards used in cash payments
2. Alternating current dynamo
3. Moving coil magnetic microphones
4. Direct current motors

39. According to the food web given, select the pair of organisms that increase in the population of the organism mentioned first causes an increase in the population of the latter mentioned organism.

1. Lizard, grasshopper
2. Bee, flowering plants
3. Cat, grasshopper
4. Grasshopper, flowering plants



40. Invasion of wild elephants into human settlement areas is a huge threat to both lives and properties of the residents. What is the most acceptable reason for this situation?

1. Elephants tend to dispel humans considering them as their natural enemies.
2. Elephants protect themselves from the threats they encounter in the forests.
3. Loss of the natural habitats of elephants due to various human activities.
4. Continuous and rapid increase in elephant population over the past few years.

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தென் மாகாணக் கல்வித் திணைக்களம்
Department of Education, Southern Province

අවසාන වාර පරීක්ෂණය - 2024 (2025)
இறுதி தவணைப் பரீட்சை - 2024 (2025) / Year End Term Test - 2024 (2025)

ශ්‍රේණිය
தரம்
Grade } **Grade 11**

Science - II

කාලය
நேரம்
Time } **3 Hours**

නම
பெயர்
Name }

විභාග අංකය
சட்டிலக்கம்
Index No. }

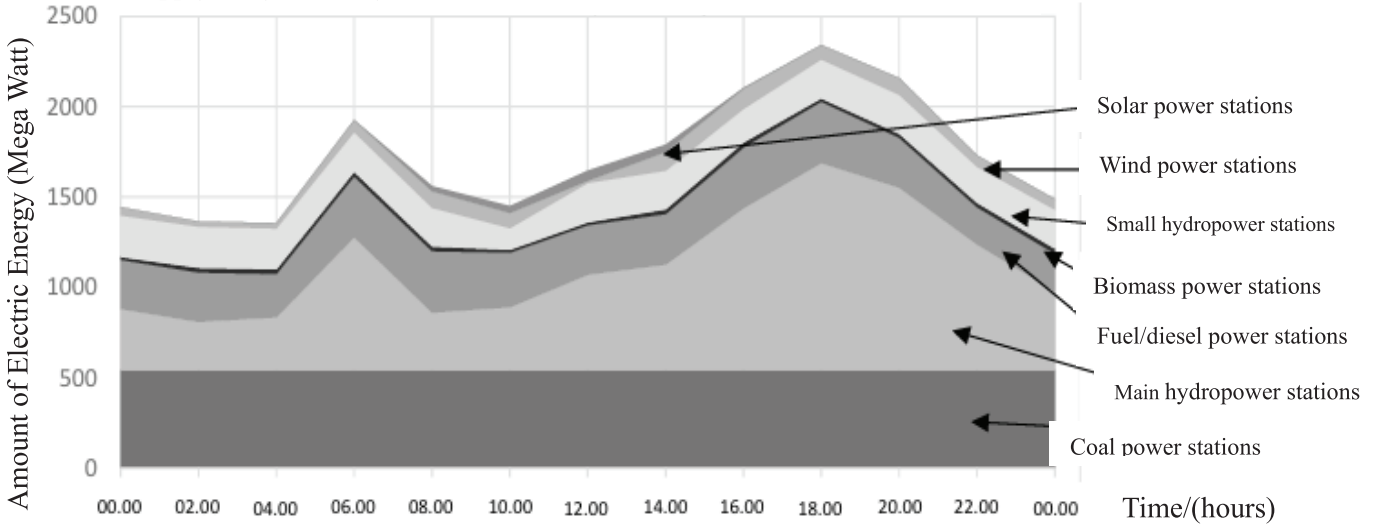
අමතර කියවීමේ කාලය - මිනිත්තු 10 යි.
Additional Reading Time- 10 minutes

Use the additional reading time for reading and selecting the questions and prioritizing in answering the selected questions.

- Answer the four questions in Part A in the space provided.
- Answer only three questions out of the five questions given in Part B.
- Attach the answer script of Part B to Part A and hand over at the end of answering.

Part A – Structured Essay

1. (A) The graph given below depicts how the amount of daily electric energy generated by each type of power stations to supply daily electricity demand in Sri Lanka on 22nd November in 2024 varies with time.

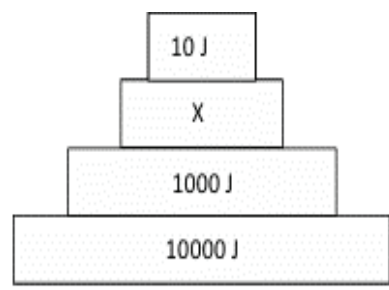


Select the type of power station that matches with the description given in the table and write in the relevant cage.

	Description	Power stations
i	Source that generates same amount of electric energy continuously through out the 24 hours of the day.	
ii	Source that generates electricity for minimum period of the day	
iii	Source that generates highest portion of the electric energy required for consumption when consumption of electricity increases	
iv	Source that generates the least amount of electric energy through out the day	

- v. Mention the two power stations that use non- renewable energy sources to generate electricity.
.....
- vi. Mention a source of energy that should be used minimumly and a source of energy that should be used maximumly for sustainable development of Sri Lanka.
.....
- vii. What is the period of the day that the consumption of electricity becomes maximum?
.....
- viii. Electric energy consumption has risen during two periodsofthe day. Mention a reason for that situation.
.....

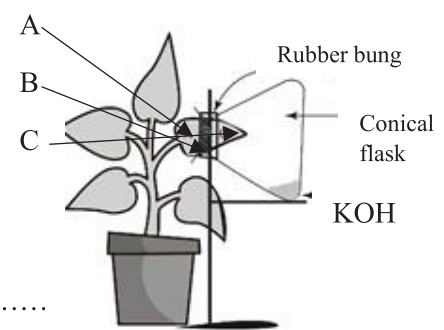
(B) The energy pyramid is drawn below depicts how energy flows along a food chain exists in a paddy cultivation.



- i. Suggest a suitable value for X.
- ii. Write down a food chain with four links existing in a paddy cultivation that suits the energy pyramid given.
.....
- iii. Select and write down the organism in which the highest accumulation of heavy metals contained in pesticides added to the paddy cultivation can be found in the food chain you wrote above.
.....
- iv. Mention the two fixation methods by which the paddy cultivation receives nitrogen naturally.
.....

2. (A) the diagram shows a set up arranged with a plant which was kept in dark for 48 hours to test for factors affecting photosynthesis.

- i. What is the reason for keeping the plant in dark for 48hours?
.....
- ii. The set up was kept in sunlight for several hours and the leaf which was in the flask was detached and tested for starch. Yet, colour of iodine did not change at places B and C of the leaf. Mention why starch has not formed in places B and C.
.....
.....



(B) Red green colour blindness is caused by a recessive gene linked to X chromosome.

- i. Illustrate the pattern of inheritance of this disease in children born to a **carrier mother** and a **diseased father** in the Punnett square given besides
- ii. What is the percentage of giving birth to a diseased child in the above marriage.
- iii. Write down the genotype of the carrier child out of the children born.

	X ^c	X ^c
X ^c		
Y		

(C) Two diagrams drawn for typical plant and animal cells based on electron micrographs are given below.

- i. Name the structures that are important to maintain the shape of each cell in the diagram (a) and (b).
Diagram (a)
Diagram (b)

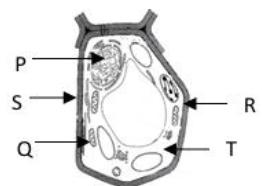


Diagram (a)

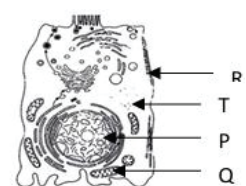
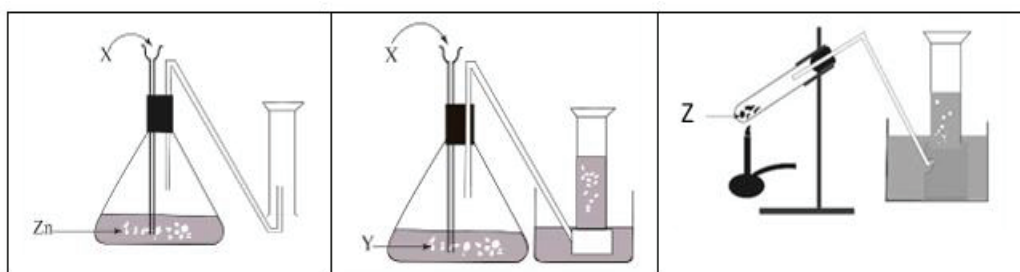


Diagram (b)

- ii. Mention a type of living plant cell and a living animal cell where organelle P is absent.
 Plant cell - Animal cell -
- iii. Write down the function of R.

- iv. (a) Write down the balanced chemical equation for the process of production of energy in organelle Q.

 (b) In which chemical compound is the energy produced in organelle Q stored?
3. (A) Some incomplete data relevant to preparation and identification tests of three gases is given below.
 Answer the questions based on it using appropriate words or symbols.



Set up A

Set up B

Set up C

- i. Name the substances that can be used as X and Y in set up B.
 X - Y -
- ii. Write down the common observation that can be seen in both set up A and B.

- iii. Which physical property of the gas produced in set up A has made it possible to use the collection method illustrated in the diagram?
- iv. If the substance denoted as Z in set up C is KMnO_4 , write down the identification test of the gas collected and the observation given during the test.
 Identification test -
 Observation -
- v. Suggest a method to increase the rate of production of the gas prepared in set up A.

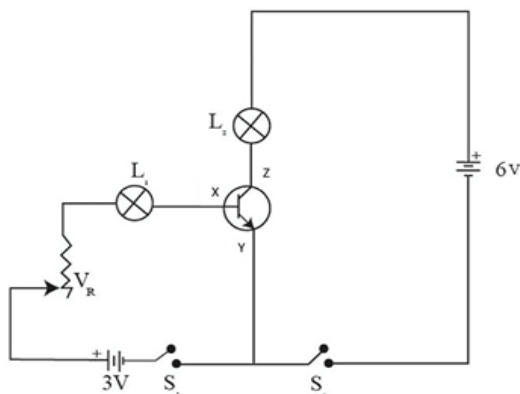
- (B) The elements belonged to the third period of the periodic table are given below.

Na	Mg	Al	Si	P	S	Cl	Ar
----	----	----	----	---	---	----	----

- i. Out of the elements given above, select and write the symbol of the suitable element against each of the statements provided in the following table.
- | | | |
|-----|---|--|
| (a) | The colourful gas exists as a diatomic molecule | |
| (b) | The element with highest electronegativity | |
| (c) | The metal extracted by electrolysis of fused chloride | |
| (d) | The element that forms an amphoteric oxide. | |
- ii. State whether the compound formed by chemical combination of following pairs of elements are ionic or covalent.
 (a) Aluminium and chlorine - (b) Chlorine and oxygen -
- iii. Write down a property of the compound formed by the element sodium and chlorine

- iv. Write down an instance where silicon is used.

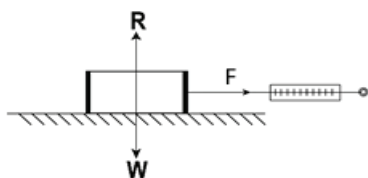
4. (A) The circuit shown below is prepared by a group of students to demonstrate the activity of a transistor. Two identical bulbs and a D400 transistor are used in the circuit.
- Complete the table given beside the circuit with the expected observations during the activity. If the particular bulb lights up, put a tick ($\checkmark$) and if it does not light up put a cross (X).



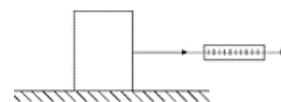
	Bulb L_1	Bulb L_2
S_1 closed, S_2 opened	$\checkmark$	
S_1 opened, S_2 closed		
S_1 closed, S_2 closed	$\checkmark$	

- State the letters that denotes the collector, emitter and base of the transistor out of X, Y and Z.
Collector - Emitter - Base -
- Is the transistor in the circuit a pnp transistor or npn transistor?
.....
- The transistor mentioned above is made of a semiconductor of pure silicon doped with small amount of phosphorus. How is such a semiconductor called?
.....

(B) The diagram illustrates a cuboid block of wood that is used for studying how the frictional force between a horizontal plane and an object kept on it varies. The block of wood is attached to a Newton balance with a string and an external horizontal force of F is exerted on it. The activity is carried out by gradually increasing the magnitude of force F from zero.



- Name the forces R and W .
 R - W -
- If the mass of block of wood is 2 kg, how much is the magnitude of force R ?
.....
- Which law is applied to find the value of R ?
.....
- When force F is being gradually increased, the block of wood just begins to move at a certain moment. What is called the frictional force exerted at this instance?
- If the way that the block of wood kept on the table is changed as illustrated in the diagram, does the force necessary to just begin the motion of the block increase, decrease or remain unchanged?
Give reasons for your answer.

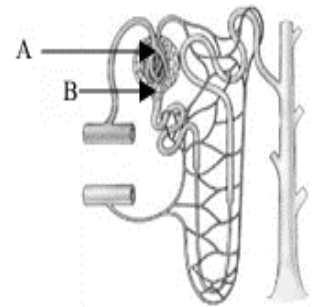


Part – B

- Answer only three questions.

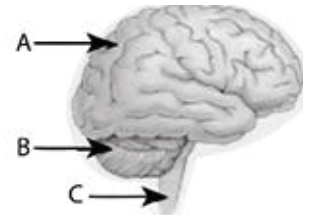
5. (A) A structure that contribute for urine formation in human kidneys is shown below.

- What is this structure that contributes for urine formation called?
- Mention a component that does not go into filtrate in B from A during the process of urine formation.
- Mention a component that is completely reabsorbed into blood during the process of urine formation.
- Which hormone secreted by the pituitary gland regulates
- the amount of urine produced?
- Mention a reason for formation of stones in kidneys and urinary bladder.



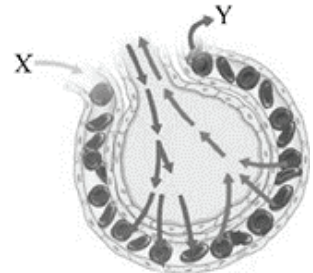
(B) The diagram illustrates a part of the central nervous system of humans.

- Name the parts denoted as A and B in the diagram.
- Mention a function carried out by part B.
- Name the functional unit of the nervous system.
- Mention a change that takes place in body functioning due to the influence of sympathetic division of the autonomic nervous system.
- Both nervous coordination as well as hormonal coordination are essential for the survival of an organism. Mention a hormone secreted by the pituitary gland that regulates the menstrual cycle of females.



(C) The diagram given below illustrates the process of gaseous exchange during respiration in humans.

- Mention a main difference in composition of blood at the places X and Y.
- Mention an adaptation of a respiratory surface for efficient gaseous exchange.
- What are the vessels that transports blood from the lungs to the heart called?

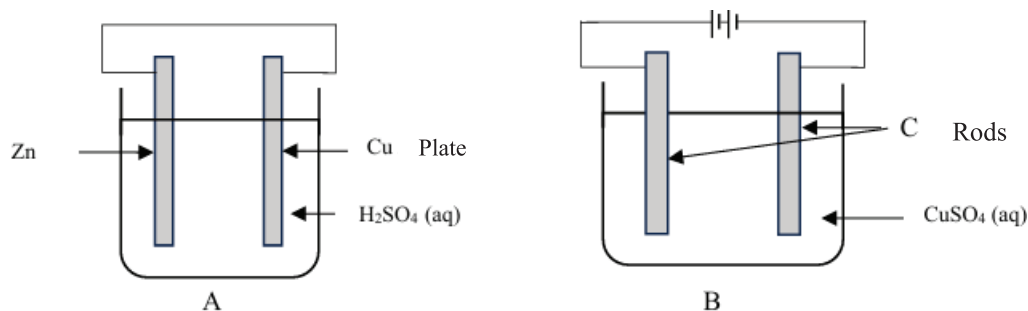


(D) The bio-synthesized proteins that increase the rate of bio-chemical reactions are called enzymes.

- Name the elements found in an enzyme.
- Amylase enzyme was added to a solution of starch and left it for about 20 minutes. Thereafter, few drops of iodine solution were added to a small portion of the mixture.
 - What is the observation made after adding iodine?
 - What is the reason for above observation?
 - To which compound does starch convert in the presence of amylase?
- Mention two enzymes produced by the small intestine of the digestive system.



6. (A) Two set – ups arranged for demonstrating electrolysis and the activity of simple cell are given below.



- In which cell out of A and B, does chemical energy convert to electric energy?
- Mention separately the places where anodic reaction takes place in cell A and cell B.
- Write down the equation for anodic half reaction in cell A.
- Write down an observation that can be made in cell B.
- Which gas is produced in cell A?
- Which cell out of the above cells can be used for electroplating?

(B) During the process of iron extraction, Fe₂O₃, CaCO₃ and coke are added to the blast furnace and heated.

- What is the type of chemical reaction that coke undergoes in the blast furnace?
- Draw the energy diagram for the reaction that CaCO₃ undergoes during iron extraction.
- Write down the balanced chemical equation for the reaction relevant to production of iron from Fe₂O₃.
- Calculate the mass of pure iron that can be extracted from 1600 g of pure Fe₂O₃.

(C) Natural rubber is a polymer.

- Write down a physical property of natural rubber.
- What is the monomer that rubber is made of?
- Rubber with different physical properties is produced by heating rubber with sulphur. This process is called vulcanization.
 - What structural change is caused to natural rubber during vulcanization?
 - Certain gas produced during combustion of vulcanized rubber in air causes acid rains. What is that gas?
- Mention a synthetic polymer and one of its uses.

7. (A) The diagram illustrates how a glass tank with length, width and height 1 m, 1m and 1.5 m respectively made for observing the interior of the ocean is immersed in the ocean with a cable attached to a ship. The mass of the tank with the person inside it is 3000 kg. (Density of sea water is 1050 kg m⁻³ and acceleration due to gravity is 10 m s⁻²)

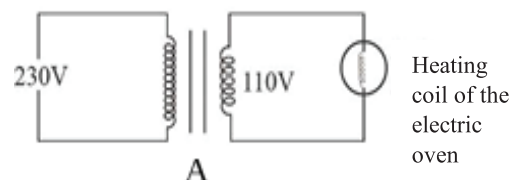


- What are the upward and downward forces acting on the tank when it is fully immersed? State them separately.
- How much is the tension exerted on the cable when the tank is fully immersed?
- (a) When the tank is immersed 10 m below the oceanic surface, how much is the pressure exerted on the upper surface of the tank by water?

- (b) The tank takes 10 s to reach the oceanic surface when it is lifted. If the tank is lifted up in uniform velocity, calculate the velocity of the tank.
- (c) How much is the work done by the motor attached to the crane, when the tank is being lifted? (Assume that no energy loss occurs during the process)
- (d) At what instance has the crane done more work during lifting of the tank? When the tank is in water or above water? Explain your answer.

(B)

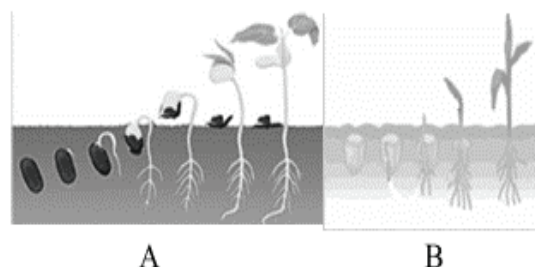
The diagram illustrates how an additional device is fixed to an electric oven of 110 V and 1100 W imported from Japan in order to be used with electric supply from the national grid of this country. The electric oven is made of a nichrome coil and it is connected to electric supply and operated for 10 minutes.



- What is called the device A attached outside the electric oven?
- What is the function intended to be performed with this device?
- Calculate the amount of electric energy consumed during the period of 10 minutes.
- Calculate the number of electric units consumed, if the electric oven is operated for 10 minutes thrice a day for 30 days.
- Calculate the resistance of the nichrome coil.
- A students said that it was better to use an immersion heater rather than an electric oven for boiling water. Is that statement true or false? Explain with reasons.

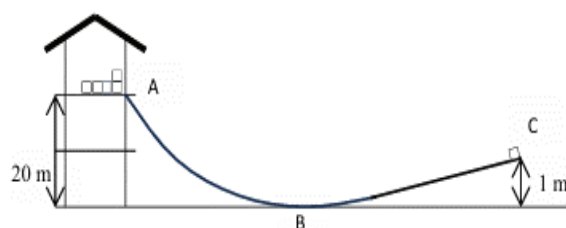
8. (A) Two types of seed germination are illustrated in the diagram.

- Which seed germination type is shown by dicotyledonous plants out of the patterns A and B?
- How can it be identified?
- Write down two factors necessary for seed germination.
- What is the type of cell division a takes place during seed germination?
- Which part of the flower becomes the seed?
- Mention the domain and the kingdom that A and B belong.
- The plants arise from seeds in A show secondary growth. What is the tissue important during that process?
- Give an example for plant that bears seeds, though it does not bear flowers.



(B) The diagram illustrates a smooth curved gutter made for bringing the excess bricks down from the upper floor of a house. The mass of a brick is 2 kg and acceleration due to gravity is 10 m s^{-2} .

- How much is the potential energy of a brick at upstairs?
- Calculate the velocity of a brick that reaches point B, if there is no loss of energy.
- If the brick becomes stationary at point C, draw the velocity time graph relevant to its motion.
- Part BC is made rough. That part exerts a uniform frictional force of 76 N on the brick.
 - Calculate the length of rough straight surface BC
 - What is the advantage of being part AB of the inclined plane curved, instead of being straight?



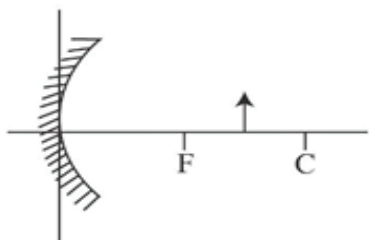
9. (A) Data related to some experiments done by a group of students in the laboratory are given below.

- A. Adding carbon tetrachloride to an aqueous solution of iodine and shaking it well.
- B. Finding out that the maximum amount of magnesium chloride that can be dissolved in 100 g of water at 25°C is 53.0 g.
- C. Combustion of piece of magnesium in air.
- D. Adding clean iron nails into two solutions of acidic KMnO_4 with equal concentration and heating one of them.
- E. Obtaining pure sodium chloride crystals by dissolving impure sodium chloride in hot water and cooling down the resulted mixture.
- F. Preparation of a solution by dissolving 10 g of pure sodium chloride in 200 ml of water.
- G. Separation of components of a mixture having components with considerably different boiling points by vaporization of the mixture and condensation of collected vapour.

• Answer the following questions in relation to the above experiments.

- i. In which experiment is the solubility of a solute tested?
- ii. In which experiment is the solvent extraction method used?
- iii. (a) Write down the balanced chemical equation related to instance C.
(b) The residue resulted from the reaction in instance C is added to water. Is the resulting solution acidic or basic?
- iv. (a) Which factor affecting rate of reaction is tested in instance D?
(b) What is the expected colour change in that instance?
- v. Write down a day-to-day life application of the separation method used in instance A.
- vi. What is called the separation method applied in separation of components as in instance E?
- vii. Explain in brief, why water and carbon tetrachloride exist as two separate layers in instance A.
- viii. Express the composition of the mixture that forms in instance F as a mass/volume fraction.

(B) An object is kept in front of a concave mirror as illustrated in the diagram given below.



- i. Copy down the diagram into your answer script and draw the ray diagram to depict formation of the image.
- ii. Write down two features of the image formed.
- iii. Does reflection or refraction of light take place in the above instance?
- iv. Write down two changes of the image, when the object is brought closer to the mirror in such a way that object distance is less than focal length.
- v. If a convex lens is used instead of the concave mirror to obtain an image with the features mentioned in (iv) above, where should the object be kept in front of the convex lens?
- vi. Mention two instances where concave mirrors are used.

