G.C.E. (O.L.) Support Seminar - 2017

Science I	*One hour*

Instructions :

    (i) *Answer all Question*

    (ii) *In each of the Question 1 to 40, pick one of the alternatives (1), (2), (3), (4) which you consider is correct or most appropriate.*

1. The element needed to produce haemoglobin in human body is,
   (1) calcium   (2) magnesium   (3) iodine   (4) iron

2. The forms in which food produced by photosynthesis is transported and stored in order are,
   (1) glucose and starch   (2) sucrose and glucose
   (3) starch and sucrose   (4) sucrose and starch

3. A generation (F_1) was obtained by a cross between purebred pea plants which produce green and yellow pods. F_2 was obtained by another cross between two F_1 plants. What should be the genotypes of homozygous dominant of homozygous recessive of F_2 plants? (consider green as *G* and yellow as *g*)
   (1) *GG, gg*   (2) *Gg, GG*   (3) *Gg, Gg*   (4) *gg, GG*

4. Which structure in the human body stores sperms temporarily?
   (1) Testes   (2) Scrotum   (3) Epididymis   (4) Prostate gland

5. The compounds which release hydrogen ions in aqueous solution is,
   (1) acids   (2) bases   (3) salts   (4) salts and bases

6. In which of the following devices both live and neutral wires can be disconnected?
   (1) Isolator, overload circuit breaker
   (2) Isolator, residual current circuit breaker
   (3) Overload circuit breaker, residual current circuit breaker
   (4) Isolator, miniature circuit breaker

7. What is the hormone which converts glycogen into glucose?
   (1) Insulin   (2) Oestrogen   (3) Glucagon   (4) Thyroxin

8. A bulb of 240 V gains a current of 1 A. Find the amount of electrical energy used by this bulb in 2 hours.
   (1) 28.8 kJ   (2) 480 kJ   (3) 1 728 kJ   (4) 28 800 kJ

9. Some reasons which cause noncontagious are given below
        A - Dehydration
        B - Taking alcohol
        C - Ultraviolet radiation
   Out of these, chronic kidney disease is caused by,
   (1) *A* and *B* only.   (2) *A* and *B* only.   (3) *B* and *C* only.   (4) *A, B* and *C*.

10. Number of protons, neutrons and electrons in $_{12}^{24}\text{Mg}^{2+}$ in order are,
    (1) 12, 12, 10   (2) 10, 12, 12   (3) 12, 10, 12   (4) 12, 24, 10

• Questions **11** and **12** are based on the elements given in the periodic table. (Symbols given are not the standard ones.)

A							D
					E	G	J
L		M				Q	
R							

11. What is the most electronegative element given here?
    (1) Q   (2) G
    (3) J   (4) R

12. What is the electronic configuration of an atom of the element Q?
    (1) 2, 7   (2) 2, 8, 1   (3) 2, 8, 2   (4) 2, 8, 7

13. Some physical properties of substances are given below
    - *A* - High specific heat capacity of water
    - *B* - High melting point of water
    - *C* - Water is denser than ice

    Out of *A*, *B* and *C*, select the properties that water has got due to intermolecular bonds.
    (1) *A* only   (2) *A* and *B* only   (3) *A* and *C* only   (4) All *A*, *B* and *C* only

14. When an object is thrown vertically upwards it travels a height of h under the acceleration due to gravity g. Velocity of the object, V should be (assume that no energy wastage took place in the object)

    (1) $2gh$ (2) $\sqrt{2gh}$ (3) $\dfrac{gh}{2}$ (4) $\dfrac{2h}{g}$

15. Atmospheric pressure in a certain place is $74\,cm\,Hg$ Density of mercury is $13600\,kg\,m^{-3}$ and that of water is $1000\,kg\,m^{-3}$. What is the height of water column that could be balanced by that atmospheric pressure?

    (1) $\dfrac{74}{100} \times \dfrac{1000}{13600}$ (2) $\dfrac{74}{100} \times \dfrac{13600}{1000}$ (3) $\dfrac{13600}{74} \times \dfrac{100}{1000}$ (4) $\dfrac{1000 \times 100}{13600 \times 74}$

16. Find the mole fraction of water in a solution made by dissolving $117\,g$ of sodium chloride (NaCl) in $1800\,g$ of water (H_2O). (H = 1, O = 16, Na = 23, Cl = 35.5)

    (1) $\dfrac{1}{51}$ (2) $\dfrac{1}{50}$ (3) $\dfrac{49}{50}$ (4) $\dfrac{50}{51}$

17. Some processes which help homeostasis of the human body are given below.
    - *A* - Secretion of glucagon
    - *B* - Secretion of ADH by pituitary
    - *C* - Vasodilation

    Select in order the instances where *A*, *B* and *C* take place
    (1) Increase of glucose level, increase of water level in blood, increase of body temperature.
    (2) Decrease of glucose level, decrease of body temperature, decrease of water level in blood.
    (3) Decrease of glucose level, decrease of water level in blood, increase of body temperature.
    (4) Increase of glucose level, decrease of water level in blood, decrease of body temperature.

18. What is the mass of glucose needed to prepare $100\,cm^3$ of a solution with a concentration of $1\,mol\,dm^{-3}$? (C = 12, H = 1, O = 16)
    (1) $18\,g$ (2) $90\,g$ (3) $180\,g$ (4) $450\,g$

19. Some properties of compounds are given below.
    - *A* - Conduct electricity in aqueous solution
    - *B* - Most of the compounds are water soluble
    - *C* - Mostly exist as molecules made of several atoms

    Out of *A*, *B* and *C*, properties seen in ionic compounds are,
    (1) *A* only.   (2) *B* only.   (3) *A* and *B* only.   (4) *B* and *C* only.

20. What is the enzyme in the mouth which converts starch into maltose?
    (1) Trypsin   (2) Amylase   (3) Rennin   (4) Lipase

21. The diagram shows a force of $20\,N$ and $8\,N$ acting in opposite directions. What is the resultant force on the object?
    (1) $8\,N$ (2) $12\,N$
    (3) $20\,N$ (4) $28\,N$

    $8\,N \leftarrow$ ▨ $\rightarrow 20\,N$

22. Select the group of animals with a two-layered body (diploblastic)
    (1) Cnidaria   (2) Annelida   (3) Mollusca   (4) Echinodermata

23. A property of ultrasounds is,
    (1) frequency less than 20 000 Hz   (2) can travel even in a vacuum
    (3) can travel in air with the maximum velocity   (4) can be reflected

24. Continuous bleeding without being clotted is the symptom of haemophilia. Haemophilia is caused,
    (1) due to a gene linkage ; genetically transmitted by a dominant gene.
    (2) due to a gene linkage ; genetically transmitted by a recessive gene.
    (3) due to a mutation gene ; genetically transmitted by a dominant gene.
    (4) due to a mutation gene ; genetically transmitted by a recessive gene.

**25.** What is the value of the resistor shown in the diagram?
    (1) $642 \, \Omega \pm 10\%$
    (2) $640 \, \Omega \pm 10\%$
   (3) $6\,400 \, \Omega \pm 10\%$
    (4) $64\,000 \, \Omega \pm 10\%$
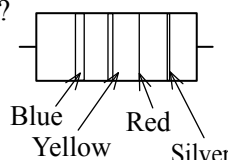
Colour	Value
Blue	6
Yellow	4
Red	2
Tolerance value	Silver ± 10

26. What are the phyla to which star fish and crocodile belong?
    (1) Pisces and Echinodermata   (2) Echinodermata and Reptilia
    (3) Amphibia and Mammalia   (4) Reptilia and Amphibia

27. Select the decomposition reaction out of the following.
    (1) $Zn + CuSO_4 \longrightarrow ZnSO_4 + Cu$ (2) $CaO + H_2O \longrightarrow Ca(OH)_2$
    (3) $CaCO_3 \xrightarrow{\Delta} CaO + CO_2$ (4) $H_2 + Cl_2 \longrightarrow 2HCl$

28. The method of cell division shown in the diagram,
    (1) helps gametogenesis.
    (2) produces haploid cells.
    (3) helps keep the number of chromosomes of a species constant.
    (4) helps keep the number of chromosomes in a cell constant.
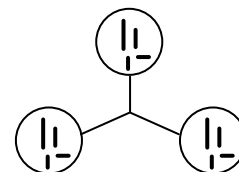
29. Hydrogen peroxide decomposes as follows.

$$2H_2O_2 \longrightarrow 2H_2O + O_2$$
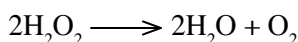
Find the number of moles of H_2O_2 to be decomposed to get 8 g of O_2. (H = 1, O = 16)
    (1) 0.5 mol   (2) 1 mol   (3) 2 mol   (4) 4 mol

30. What could be used to diverge the light rays given as *OA* and *OB*?
    (1) Concave lens, convex mirror   (2) Concave lens, concave mirror
    (3) Convex lens, concave mirror   (4) Convex lens, plane mirror
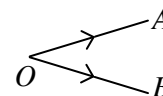
31. What is the group of bacteria which converts ammonium (NH_4^+) ions in soil into nitrite (NO_2^-) ions,
    (1) *Pseudomonas*   (2) *Nitrobacter*   (3) *Nitrosomonas*   (4) *Rhizobium*

32. Formula of the chloride of an element called *X* is *X*Cl. Formula of the carbonate of *X* is,
    (1) XCO_3 (2) X_2CO_3 (3) $X(CO_3)_2$ (4) $X_2(CO_3)_2$

33. Which of the following does **not** travel through a vacuum?
    (1) Transverse waves   (2) Longitudinal waves
    (3) X - rays   (4) Visible light

34. According to the diagram, the distance given as x is equal to which of the following of the convex lens?

(1) Half of the focal length

(2) Focal length

(3) Distance between focal length and two times the focal length

(4) Two times the focal length
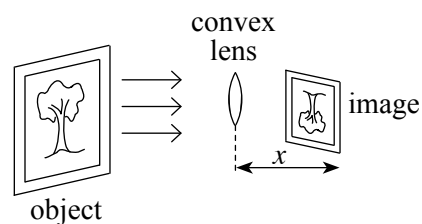
35. Solutions are prepared by dissolving equal masses of NaOH, NaCl and $NaHCO_3$ separately in $250\,cm^3$ flasks. What is the choice which gives the concentration of the solutions in ascending order?
(Na = 23, O = 16, H = 1, Cl = 35.5)

(1) $NaCl < NaOH < NaHCO_3$

(2) $NaHCO_3 < NaCl < NaOH$

(3) $NaOH < NaCl < NaHCO_3$

(4) $NaOH < NaHCO_3 < NaCl$

36. A person decided to replace six 60 W filament bulbs with six 12 W LED bulbs. He could save about Rs. 4400 annually. What could be concluded accordingly.

(1) Neither filament bulbs nor LED bulbs are economical

(2) LED bulbs consume less electricity

(3) More LEDs should be used to obtain light obtained by a filament bulb

(4) Filament bulbs consume less electricity

37. Diagrams given below show the magnetic field formed around a current carrying wire called *AB*.

⊙　　Magnetic field out of the paper

⊗　　Magnetic field into the paper

⟶　Current direction

(a)　　　　　(b)　　　　　(c)　　　　　(d)
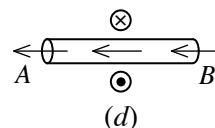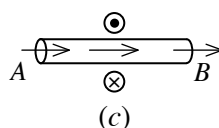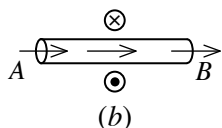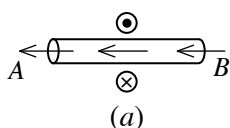
What are correct out of the above diagrams?

(1) (a) and (b) only.　(2) (a) and (d) only.　(3) (b) and (c) only.　(4) (c) and (d) only.

38. An organism in having tissue and organ level organization is

(1) Amoeba　　　(2) *Mucor*　　　(3) *Chlamydomonas*　　　(4) Monarakudumbiya

39. The resultant moment acting on the rod is,

(1) $100\,N\,m$ clockwise.

(2) $100\,N\,m$ anticlockwise.

(3) $200\,N\,m$ anticlockwise.

(4) $200\,N\,m$ clockwise.
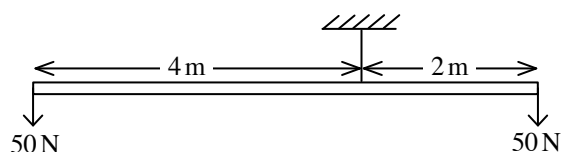
40. When the switch '*S*' in the circuit is closed

(1) only *A* glows.

(2) only *B* glows.

(3) both *A* and *B* glow.

(4) neither *A* nor *B* glow.

✳✳✳
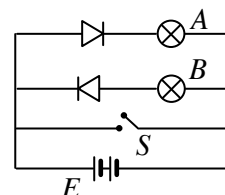
G.C.E. (O.L.) Support Seminar - 2017

Science II	*Three hours*

Instructions :
   (i)   *Answer all **four** questions in Part **A**, in the space provided.*
   (ii) *Answer **three** questions in Part **B**.*

Part A - Structured Essay

1. (A) The table gives data regarding the environment, occupation, food patterns and number of diabetics in few samples of people in Sri Lanka.

Sample	Food pattern	Occupation	Environment	Number of diabetics per 1000
A	Instant food with flavours, food made of flour and sweets at least for one meal daily	Executive level	Urban	780
B	Instant food with flavours, food made of flour and sweets at least for one meal weekly	Executive level	Urban	600
C	Local vegetables with local spices and sweets	Executive level	Urban	200
D	Local vegetables with local spices, local fruits	Normal jobs	Rural	25
E	Vegetables obtained from own home garden with local spices, local fruits	Labourer	Rural	05

   (i)   Represent the above data on a line graph or a bar graph.

Number of Patients

0.0   A   B   C   D   E   Sample
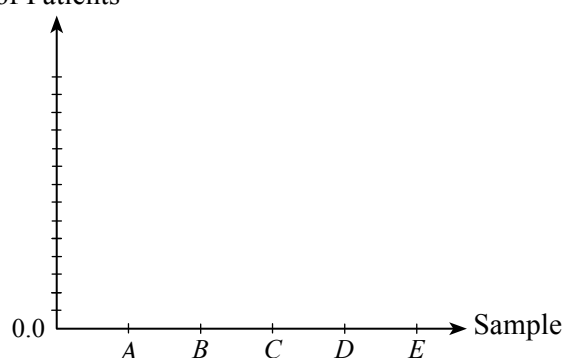
   (ii) According to these data, write a cause of diabetes.

   ....

   (iii) Name one of the ways according to Ayurveda completed by people in sample E to stay away from noncontagious diseases.

   ....

(iv) Table gives data regarding the breakfast taken by two people of samples *A* and *E* in Galle.

	Food	Food mile
Sample *A*	Bread (flour – America)	9340
	Chicken (Colombo)	200
	Margarine (Colombo)	200
	Apple (Australia)	4000
	Artificial flavours (India)	500
Sample *E*	Red rice (own paddy field)	02
	Gravy (coconut – Matara)	25
	Green gram curry (own land)	02
	Banana (home garden)	00
	Spices obtained from the village	04

(a) Out of food obtained by *A* and *E*, what is more beneficial for a country?

....

(b) Write the reason for your answer in (a) above

....

(B) Government has decided to ban polythene and plastics as they are not eco friendly. Table shows the approximate amount of that type of substances discarded by an institute.

Substance	Quantity per year
Polythene (for decoration)	2 500
Shopping bag	15 000
Lunch sheet	10 000
Regiform food containers	15 000

(i) These substances keep on collecting in the environment. Due to the prevention of which process does it happen?

....

(ii) Name an eco friendly substitute that can be used to make food containers.

....

(iii) Write a problem caused when using the substitute mentioned above.

....

(C) It is impossible to increase the generation of hydropower in our country. Since using petroleum for this purpose is very expensive, attention is paid on renewable energy sources.

(i) Out of the alternative energy sources used in Sri Lanka, what is the source with the least production cost?

....

(ii) Write a reason for energy crisis.

....

(iii) What could be the reason for less use of renewable energy sources though they are sustainable?

....

(D) Water body in an urban area looks green and gives out a bad smell.

(i) What is reason for this condition?

....

(ii) Write a harmful effect of the condition mentioned in (i) above.

....

(iii) Biomagnification is also a problem seen in this type of water bodies. Write a characteristic of substances which biomagnify.

....

2. **(A)** Diagrams show two types of cells observed under the light microscope in an activity done to identify plant and animal cells.
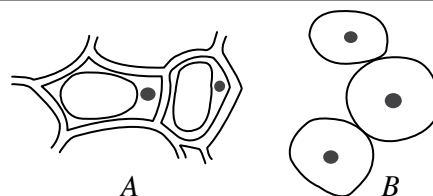
(i) What is the plant cell out of *A* and *B*?

....

A   *B*

(ii) Differentiating cells is the purpose of the above observation. Which power of the light microscope should be used for this purpose?

....

....

(iii) Name two types of specimen that could be used to observe these cells.

....

....

(B) Following questions are based on plant tissues. Some characteristics of some permanent plant tissues are given as *A*, *B*, *C* and *D*.

A - Made of living cells with intercellular spaces.
B - Made of different types of cells.
C - Made of dead cells.
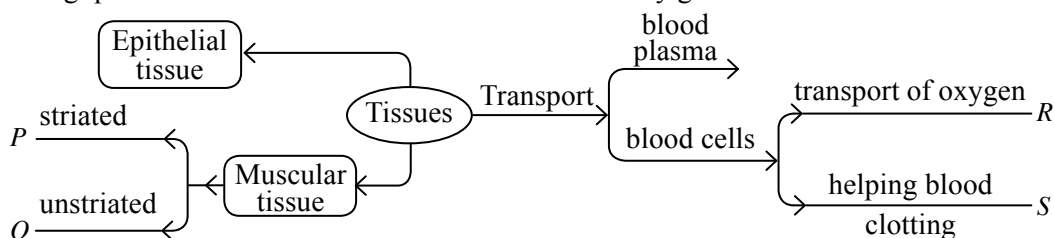*D* - Corners of cells are thickened with cellulose.

(i) Out of *A*, *B*, *C* and *D*,

(a) what could be observed in a potato tuber?

....

(b) which one do transport tissues have?

....

(c) what can be a characteristic of sclereids?

....

(ii) What is the difference between the shape of cells of *A* and *D*?

....

(C) Following questions are based on tissues in the human body given in the chart.

```
                          blood
   Epithelial              plasma
    tissue  ←─────┐    Transport ┌──────→ transport of oxygen
                  │                       ──────────────── R
   striated    Tissues ──────→  blood cells
P ─────────←                    └──────→  helping blood
            ┌ Muscular ←                  clotting      S
   unstriated│ tissue
Q ─────────←
```

(i) What is the main function of epithelial tissue?

....

(ii) Name the type of tissue given as *P*.

....

(iii) Name a place in the human body which has muscles given as *Q*.

....

(iv) Write a substance contained in blood plasma?

....

(v) Name the blood cells which carry out functions given as *R* and *S*.

R : ....

S : ....

3. Equal amount of strips and pieces magnesium were separately made to react with $100.00 \, cm^3$ of $0.2 \, mol \, dm^{-3}$ HCl. The volume of gas produced by the two reactions was measured and represented on a graph as shown. *X* and *Y* are the two graphs obtained.

volume of the gas/cm^3
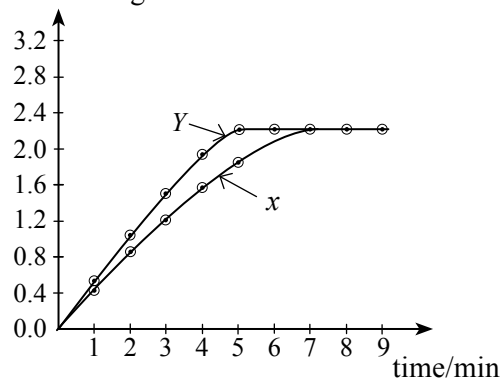
(i) Out of *X* and *Y*, what is the graph related to pieces of magnesium?

....

(ii) Write a reason for your answer in (i) above.

....

(iii) What is the rate of reaction of the reaction of *X* at the end of the 2nd minute?

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

(iv) What is the maximum volume of the gas collected?

....

(v) (a) Write the balanced chemical equation for the reaction between magnesium and dilute hydrochloric acid.

....

(b) What is the number of moles of magnesium chloride formed at the end of each experiment above? (Mg = 24, Cl = 35.5)

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

(c) What is the mass of magnesium chloride formed in (b) above? (Mg = 24, Cl = 35.5)

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

(d) What is the number of molecules of hydrogen gas formed in (b) above?

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

(vi) (a) State the type of bonds in magnesium chloride.

....

(b) Write a property of a compound having this type of chemical bonds.

....

(vii) Downward displacement of water is one method used in the laboratory to collect hydrogen

(a) Name the other method used to collect hydrogen.

....

(b) Write the reason for the answer in (vii) (a) above.

....

(viii) (a) Write a physical property of hydrogen gas.

....

(b) Name a chemical industry which uses hydrogen

....

4. (A) The diagram shows a set up used to remove water by siphoning. Atmospheric pressure is π acceleration due to gravity is *g* and density of water is ρ.
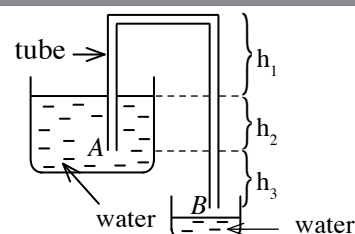
(i) How should the tube stay at the beginning to remove water by this method?

....

(ii) State whether the speed of water at the end *B* increases or decreases or remains the same in each of the following instances.

(a) Immersing the end *A* deeper in the tank ....

(b) Adding some more water to the tank ....

(c) Increasing the length of h_3 ....

(iii) Write an expression using the given symbols to find the pressure at a point near *A* in the tank.

....

(iv) State the height of the tube which affects removal of water at *B*.

....

(v) Write an application of each liquid pressure and air pressure.

• Liquid pressure   ....

• Air pressure   ....

(B) The diagrams show three instances of immersing an object in water and the reading on the spring balance in each instance. 40 N of water is displaced in the instance given as *z*.

x   *y*   *z*
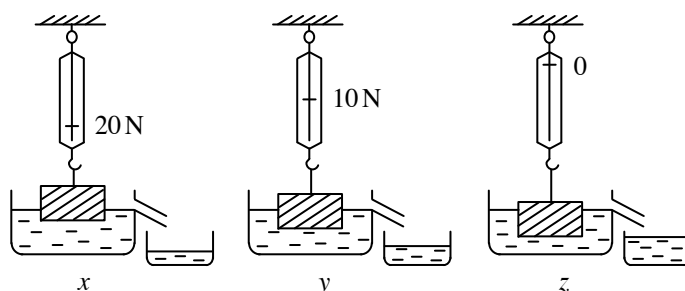
(i) What is the weight of the object?

....

(ii) Find the weight of water displaced in the instance *x*.

....

(iii) What is the upthrust in the instance *y*?

....

(iv) State the two forces acting on the object in the instance *z*.

....

....

(v) What can you say about the upthrust on the object in *z* if the object is immersed in a liquid denser than water?

....

✻✻

Part B - Essay

- Answer any **three** questions.

5. (A) The diagram shows the structure of a human nephron.

(i) Name a process each takes place at *A*, *B* and *C*.

(ii) Which structural difference between *D* and *E* creates high pressure in glomerulus?

(iii) Urine production is a process of three steps. Ultrafiltration and secretion are two of them.

(a) Name the other step.

(b) Which process filters blood plasma to the Bowman's capsule through the walls of glomerular capillaries and Bowman's capsule.

(c) Name a nitrogenous waste in urine.

(iv) Why human faeces are **not considered** as an excretory product?

(v) High blood pressure and tissue inflammation were observed in a person. pH was lower than usual and urea concentration in blood was high.

(a) Name the disease that the person is suffering from.

(b) State a healthy that followed daily to keep kidneys healthy.
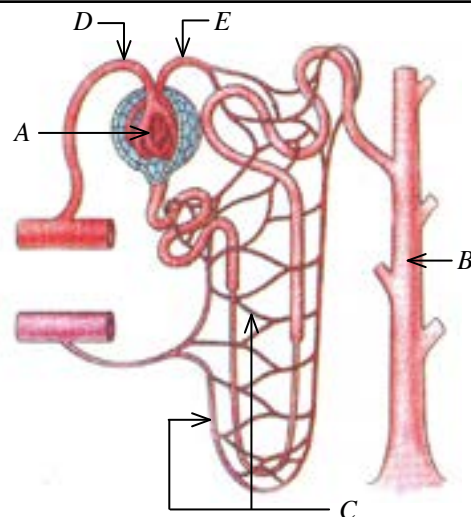
(B) (i) The chart shows the different components in human blood. Name *a*, *b*, *c* and *d* in it.
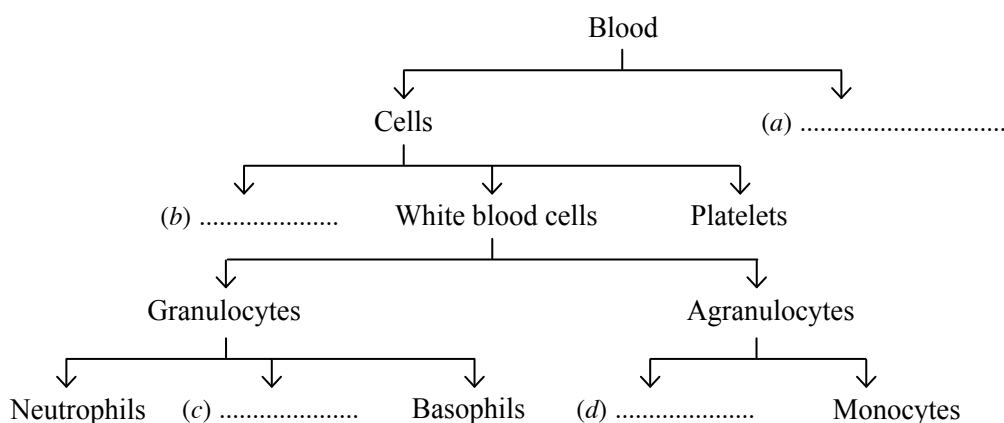
(e) Fighting germs is the function of white blood cells. Phagocytosis is one way of doing this. What is the other way?

(ii) The diagram shows a part of an Electrocardiogram (ECG) of a person.
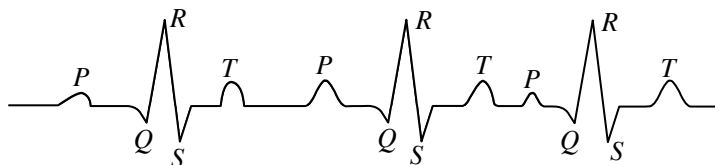
It represents three stages of cardiac cycle. They are given as *P*, *QRS* and *T*.

(a) Name one of those stages.

(b) Closing of which valves causes the "lub" sound in heartbeat

(iii) Blood pressure of a healthy person is 120/80 mm Hg. A doctor noticed that the blood pressure of a person was 120/95 mm Hg.

(a) Which type of blood pressure is shown by each 120 and 95?

(b) According to this report, what is the disease of the person related to blood pressure?

6. **(A)** Substances used to experimentally determine the heat change of the reaction between sodium hydroxide (NaOH) and hydrochloric acid (HCl)

- $100\,cm^3$ of $2\,mol\,dm^{-3}$ HCl solution
- $100\,cm^3$ of $2\,mol\,dm^{-3}$ NaOH solution
- A thermometer of $0\,°C$ - $100\,°C$
- A vessel covered with polystyrene
- A glass rod

(i) Is the above reaction exothermic or endothermic?

(ii) According to the above list, what would be the mass of the solution with the acid and the base? (density of water = $1\,g\,cm^{-3}$)

(iii) If the initial temperature of the solution was $30\,°C$ and final temperature was $38\,°C$, calculate the heat change of the reaction. (specific heat capacity of water = $4200\,J\,kg^{-1}\,°C^{-1}$)

(iv) What is the purpose glass rod used in this experiment?

(v) Explain briefly the effect of using a copper vessel instead of the polystyrene vessel on the temperature change.

(B) Diagrams show the structures of two hydrocarbons.

(i) (a) Select the alkane out of P and Q.
(b) Write the reason for your answer in (i) (a) above.

(ii) What is more reactive out of P and Q? Write the reason for your answer.

(iii) Name the polymer made from Q.

(iv) Draw the structure of the derivative of Q used to make Teflon.
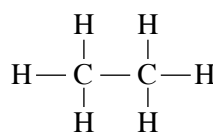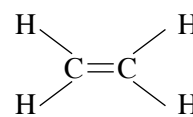
Diagram P Diagram Q

(C) The diagram shows a set up used to electrolyse acidulated water.

(i) Name the anode and cathode of this set up
(a) Anode
(b) Cathode

(ii) Write the anodic reaction.

(iii) Draw the Lewis dot diagram of a molecule of the gas evolving at the cathode.

plastic vessel

Carbon rod
Electrode A

Carbon rod
Electrode B

9 V
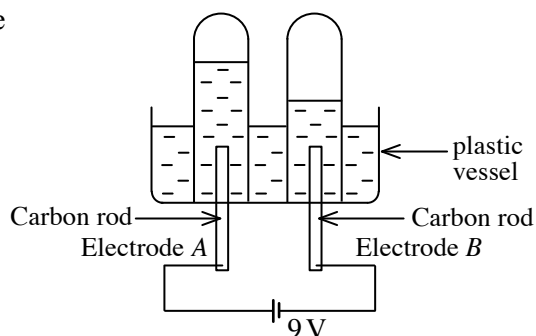
7. **(A)** The diagrams show how cuboidal shaped objects of $20\,N$ each with uniform surfaces are placed on a table and how they are pulled with a spring balance. A force of $40\,N$ is used to pull the object in the instance A. (g = $10\,m\,s^{-2}$)

Instance A Instance B Instance C
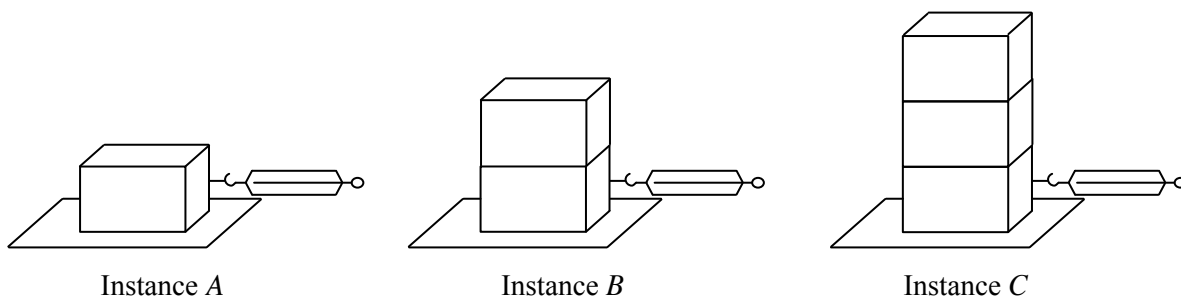
(i) Is the force needed to make the object move in the instance B more or less than in A?

(ii) Related to the instances A and B, write an expression to show the connection between the mass of the object and its acceleration (a).

(iii) If a force of $60\,N$ was applied in the instance C, find the acceleration of the object.

(iv) What is the connection between normal reaction and limiting frictional force when considering the motion of the objects in instances *A* and *B*?

(v) If the object in instance A is placed on the table with a different face in contact and pulled, will the force be 40 N or less or more than that?

(vi) Even if a large force is applied, fibres in a rope do not separate. Explain why?

(B) The diagrams I and II show two circuits used for half-wave and full-wave rectification. A bicycle dynamo supplies electricity to *A* and *B*.
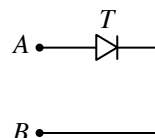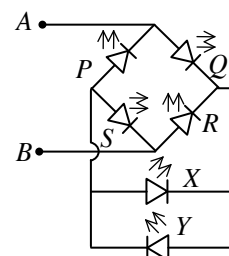
(i) What is the type of current produced by the bicycle dynamo?

(ii) What do you call the type of rectification done by the circuit 1?

(iii) If the terminals of the diode in the circuit 1 are interchanged, what would be the form of the graph between voltage and current change.

(iv) Which LEDs in the circuit II glow when current flows from *B* to *A*?

(v) Show in a graph the variation of the voltage with time when the dynamo supplies electricity to the circuit II.

(vi) What should be connected to the circuit to smooth the current obtained here.

(vii) If the LED given as *R* is removed, what would be change in the form graph mentioned in (v) above?

Diagram I

Diagram II

8. (A) (i) A leaf is taken from plant is sunny place. Write in order the steps of an experiment done to test this leaf for starch. Write the reason of each step.

(ii) Write **two** external factors needed for photosynthesis.

(iii) Write the balanced chemical equation for photosynthesis.

(iv) Explain how photosynthesis helps balance the composition of air.

(B) (i) New plants are produced by aerial or underground parts in natural vegetative reproduction. Which vegetative parts of the following plants do that?
(a) Curry leaves
(b) Kadupul
(c) Ginger

(ii) Tissue culture is an artificial propagation method. Write **two** advantages of tissue culture.

**(C)** An object called A of 12 kg is placed at the peak of a mountain of 7 m.
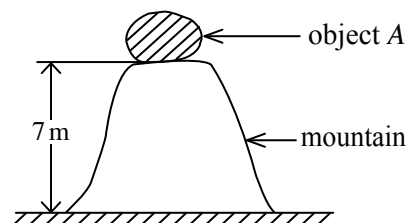
(i) Name **two** forms of energy used to do work.

(ii) What is the gravitational potential energy of the object *A*? ($g = 10\,m\,s^{-2}$)

(iii) Write the energy transformation taking place when the object falls.

(iv) If 40 seconds were taken to take the object the peak of the mountain, calculate the rate of doing work?

[See page nine

9. (A) The diagram shows a set up arranged by a student with inactive electrodes to electrolyse an aqueous solution of sodium chloride (NaCl).
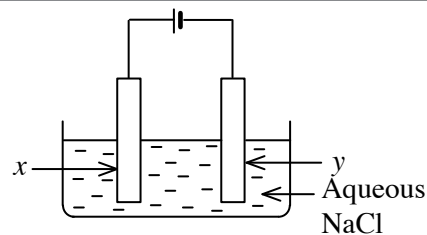

(i) Write an observation made in the circuit when a current flows in the external circuit.

(ii) Name a material used for electrodes *x* and *y*.

(iii) What is the gas evolving at the electrode *x*?

(iv) Write the half reaction taking place at *y*.

(v) What is the compound remained in the solution at the end of electrolysis?

(vi) If the terminals of the cell are interchanged, will it affect the substances produced by the set up?

(vii) Write two industrial applications of electrolysis.

(B) Diagram shows how 2Ω, 3Ω and 4Ω resistors are connected in a circuit.
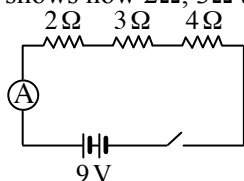
(i) What do you call the connection of resistors in this way?

(ii) Write a factor that all resistors get equally here.

(iii) What is the voltage across 2Ω resistor when the switch is closed?

(iv) State a factor of the circuit which could change if the 4Ω is removed.

These resistors are reconnected as shown.
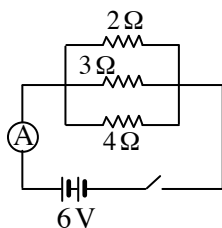
(v) Name a factor that resistors get equally and differently when connected in this way.

(vi) Find the total resistance of the resistors when connected in this way

(vii) How does the total resistance change when resistors are connected in the two ways given above?

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