නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

NEW 34 E I

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2017 දෙසැම්බර්
கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2017 டிசெம்பர்
General Certificate of Education (Ord. Level) Examination, December 2017

විද්‍යාව I
விஞ்ஞானம் I
Science I

පැය එකයි
ஒரு மணித்தியாலம்
One hour

Note :

* *Answer **all** questions.*
* *In each of the questions **1** to **40**, pick one of the alternatives (1), (2), (3), (4) which you consider as **correct** or **most appropriate**.*
* ***Mark a cross** (×) **on the number corresponding to your choice in the answer sheet provided.***
* *Further instructions are given on the back of the answer sheet. Follow them carefully.*

1. Which of the following plants is a gymnosperm?
(1) Coconut (2) Paddy (3) Grass (4) Pinus

2. What is the unit of the moment of force?
(1) $J\ s^{-1}$ (2) $kg\ m\ s^{-2}$ (3) $N\ m$ (4) $N\ m^{-2}$

3. The organ which mainly contributes to nitrogenous excretion in the human is
(1) skin. (2) kidney. (3) nose. (4) lungs.

4. Which of the following substances can be mixed with water to make a heterogeneous mixture?
(1) Copper sulphate (2) Ethyl alcohol (3) Sugar (4) Wheat flour

5. Which of the following organelles releases energy by aerobic respiration?
(1) Nucleus (2) Mitochondrion (3) Ribosome (4) Golgi complex

6. Which of the following oxides is basic?
(1) MgO (2) Al_2O_3 (3) SO_2 (4) SiO_2

7. The animal tissue given in the diagram is
(1) a muscle tissue. (2) a nervous tissue.
(3) an epithelial tissue. (4) a connective tissue.

8. Which of the following energy transformations takes place in a bicycle dynamo?
(1) Electric energy ⟶ Mechanical energy (2) Thermal energy ⟶ Electric energy
(3) Mechanical energy ⟶ Electric energy (4) Electric energy ⟶ Light energy

9. The biochemical reactions that take place in organisms are catalysed by
(1) hormones. (2) enzymes. (3) fatty acids. (4) water.

10. In which of the following instances, does a couple of forces act?
(1) When a door is opened by pushing
(2) When a nail is unscrewed by a screw driver
(3) When the rope is pulled in opposite directions by two groups in a competition of pulling ropes
(4) When two persons are pushing a box in the same direction, which is kept on the floor

11. The number of electrons and the number of protons in an Al^{3+} ion are respectively, (The atomic number of Al is 13.)
(1) 10, 13 (2) 10, 27 (3) 13, 13 (4) 13, 27

12. What is the standard notation of Tritium?
(1) ${}^{1}_{1}H$ (2) ${}^{2}_{1}H$ (3) ${}^{3}_{1}H$ (4) ${}^{3}_{3}H$

13. Which of the following adaptations is shown by the seeds of Hora/Ennei plant for dispersal by wind?
(1) Possessing wing-like structures (2) Presence of hairs
(3) Having air-filled shells (4) Consisting of different patterns

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14. A certain covalent compound is completely ionized in water. Which of the following could be this compound?
(1) NH_4OH (2) HCl (3) $CuSO_4$ (4) H_2CO_3

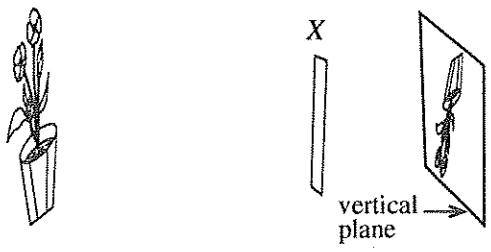
15. The endocrine glands that secrete glucagon and calcitonin in human body are respectively,
(1) pancreas and thyroid. (2) adrenal and thyroid.
(3) pituitary and adrenal. (4) thyroid and pancreas.

16. Select the option in the table which gives the most suitable extraction method for each of the elements potassium, calcium and lead.

	Potassium	Calcium	Lead
(1)	Electrolysis	Reduction	Physical method
(2)	Electrolysis	Reduction	Reduction
(3)	Reduction	Electrolysis	Physical method
(4)	Electrolysis	Electrolysis	Reduction

17. On a horizontal ground, the point B is located to the east of A and point C is located to the north of B. An ant has moved from A to C through the straight line paths AB and BC. If AB = 3 m and BC = 4 m, what is the displacement of ant in this motion?
(1) 4 m. (2) 5 m. (3) 7 m. (4) 25 m.

18. A situation where an image of a flower pot taken on to a white vertical plane using an item called X is shown in the figure. Which of the following could be X?
(1) A plane mirror
(2) A convex mirror
(3) A concave lens
(4) A convex lens



19. Which of the following statements is true regarding waves?
(1) Transverse waves propagate with compressions and rarefactions.
(2) The distance between a crest and a trough of a transverse wave is equal to the wave length of that wave.
(3) It is not necessary to have a medium for the propagation of mechanical waves.
(4) Energy is transmitted by the mechanical waves without the transmission of substance.

20. The salts which precipitate in the first tank and third tank, in the production process of salt from sea water are respectively,
(1) $CaCO_3$ and $NaCl$ (2) $CaSO_4$ and $MgSO_4$
(3) $MgSO_4$ and $NaCl$ (4) $CaCO_3$ and $CaSO_4$

21. Select the most efficient food chain among the food chains given below.
(1) Grass → Deer → Tiger
(2) Carrot → Rabbit → Python → Hawk
(3) Grass → Grass hopper → Rat → Cobra → Hawk
(4) Paddy → Rat → Hornbill → Hawk

22. The composition of a glucose solution in terms of mass and volume is 90 g dm^{-3}. What is the concentration of that glucose solution? (Relative molecular mass of glucose is 180)
(1) 0.25 mol dm^{-3} (2) 0.50 mol dm^{-3} (3) 0.75 mol dm^{-3} (4) 2.00 mol dm^{-3}

23. Which of the following is **not** a function of nucleic acids?
(1) Storing genetic information of organisms (2) Contributing to protein synthesis
(3) Controlling activities of the cell (4) Maintaining body temperature

24. The final products of the reaction of haematite (Fe_2O_3) with carbon monoxide gas in the temperature range of 1000 °C – 1900 °C are
(1) Fe and CO_2 (2) FeO and CO_2 (3) Fe and O_2 (4) FeO and $FeCO_3$

25. Which of the following end products of digestion is **not** absorbed by the blood capillaries of the villi in the small intestine in human?
(1) Amino acids (2) Glycerol (3) Galactose (4) Fructose

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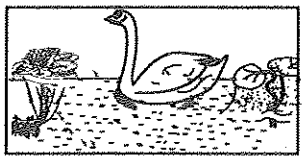
26. Which of the following is a function of human cerebellum?
(1) Maintaining the balance of the body
(2) Performing high mental activities
(3) Perception of visual stimuli
(4) Control of respiration

27. A situation where a swan of mass 1.3 kg is at still water in a pond is given in the figure. What is the upthrust acting on the swan by water? (Take the value of gravitational acceleration as 10 $m\,s^{-2}$)



(1) 1.3 N
(2) 8.7 N
(3) 10.0 N
(4) 13.0 N

28. Consider the following chemical reaction.

$$ZnSO_4 + X \longrightarrow XSO_4 + Zn$$

Which of the following elements could be **X**?
(1) Fe
(2) Al
(3) Mg
(4) Cu

29. A saturated solution of sugar was prepared at 80 °C temperature by dissolving a solid sample of sugar which has been made impure by a small amount of table salt. Which of the following measures can be taken to get pure sugar crystals?
(1) Increasing the temperature of the solution
(2) Cooling the solution
(3) Diluting the solution
(4) Filtering the solution

30. Consider the instances *A*, *B* and *C* given below.
A - A bat flying at night emitting ultrasound waves of 21 000 Hz.
B - A dolphin preying in the ocean emitting ultrasound waves of 21 000 Hz.
C - A rabbit walking in the jungle emitting ultrasound waves of 21 000 Hz.

If the speeds of sound emitted at the above instances are V_A, V_B and V_C respectively, which of the following relationships is correct?
(1) $V_A < V_B < V_C$
(2) $V_B < V_C < V_A$
(3) $V_A = V_C < V_B$
(4) $V_A = V_B = V_C$

31. An iron nail which was in contact with a metal *M* was kept in an agar medium which consists of small amounts of sodium chloride, potassium ferricyanide and phenolphthalein. After one hour, only pink colour was seen in the agar medium around the nail. *M* could be
(1) copper.
(2) lead.
(3) stanus.
(4) aluminium.

32. Consider the following features.
A - Nucleus is present peripherally in the cytoplasm.
B - Having spherical cells with a large central vacuole.
C - No inter cellular spaces

Of the above features, the features of parenchyma tissue are
(1) only *A* and *B*.
(2) only *B* and *C*.
(3) only *A* and *C*.
(4) all *A*, *B* and *C*.

33. On a table, a box is in equilibrium under three coplanar forces of 10, 15 and *P* Newtons. The resultant of the two forces 10 N and 15 N is 12 N. Consider the statements Ⓧ, Ⓨ and Ⓩ regarding the force *P*.
Ⓧ - Magnitude of *P* is 12 N.
Ⓨ - *P* acts in the direction of the resultant force of the two forces 10 N and 15 N.
Ⓩ - The line of action of *P* goes through the intersecting point of the lines of actions of the two forces 10 N and 15 N.

Of the above statements,
(1) only Ⓧ and Ⓨ are true.
(2) only Ⓨ and Ⓩ are true.
(3) only Ⓧ and Ⓩ are true.
(4) all Ⓧ, Ⓨ and Ⓩ are true.

34. An organism has the following features.
A - Consisting of eukaryotic cells
B - Has the ability to decompose organic matter
C - Presence of chitin in the cell wall

To which kingdom does the above organism belong?
(1) Protista
(2) Fungi
(3) Plantae
(4) Animalia

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35. The sound wave obtained by tapping a drum softly was observed in the cathode ray oscilloscope as in figure (a). Which of the following could be the wave form that is obtained, when the drum is tapped with a larger force than the above instance?

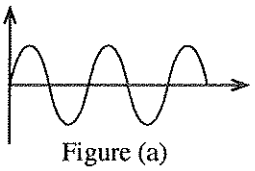
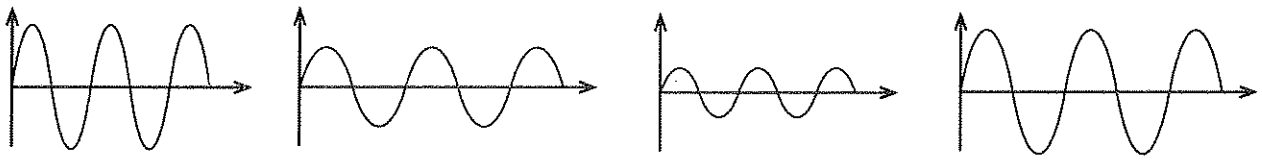


Figure (a)

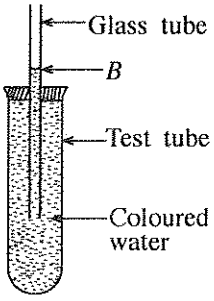


(1) (2) (3) (4)

36. A child of mass 40 kg walked along a staircase from the first floor to the third floor of a building which is 9 m high from the first floor. The time taken by the child for this entire motion is 2 minutes. What is his rate of doing work? (Take the acceleration due to gravity as 10 m s^{-2})

(1) 30 W (2) 400 W (3) 1 800 W (4) 3 600 W

37. Test tube with the glass tube given in the figure is immersed in a vessel with water and heated for a small period of time.



Three statements regarding the observations of this experiment are given below.

X - The water level in the glass tube rises up gradually from *B* and stops.
Y - The water level in the glass tube drops down gradually from *B* and stops.
Z - The water level in the glass tube drops down from *B* and then rises up and exceeds the level *B*.

Of the above statements,

(1) *X* is true. (2) *Y* is true.
(3) *Z* is true. (4) all *X*, *Y* and *Z* are false.

38. The information relevant to the motion of an object in a straight line is given below.

Time/s	0	1	2	3	4	5	6
Displacement/m	0	4	8	10	14	16	18

Which of the following statements is correct, according to the above information?

(1) The object has moved at a uniform velocity during the total period of time.
(2) The mean velocity of the object is 3 m s^{-1} during the entire motion.
(3) The object has come again to the starting position.
(4) The total distance travelled by the object is 70 m.

39. A straight conductor *AB* which carries current *I* is kept in a magnetic field. The direction of magnetic field is perpendicular to the direction of flow of current through the conductor.

Consider the changes done separately in situations *X* and *Y* given below.

Situation *X* : Increasing current upto 2*I* without changing the magnetic field

Situation *Y* : Decreasing the strength of magnetic field while keeping the current through *AB* as *I*.

Which of the following statements is correct regarding the magnetic force that acts on *AB* in the two situations?

(1) Magnetic force increases only in situation *X*
(2) Magnetic force increases only in situation *Y*
(3) Magnetic force increases in both situations *X* and *Y*
(4) Magnetic force decreases in both situations *X* and *Y*

40. Consider the following activities.

A - Minimization of food mile
B - Energy management
C - Use of traditional knowledge and technology

The important activities for the sustainable development of Sri Lanka are

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

* * *

නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

NEW

இலங்கைப் பரீட்சைத் திணைக்களம்
Department of Examinations, Sri Lanka

34 | E | II

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2017 දෙසැම්බර්
கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2017 டிசெம்பர்
General Certificate of Education (Ord. Level) Examination, December 2017

විද්‍යාව II
விஞ்ஞானம் II
Science II

පැය තුනයි
மூன்று மணித்தியாலம்
Three hours

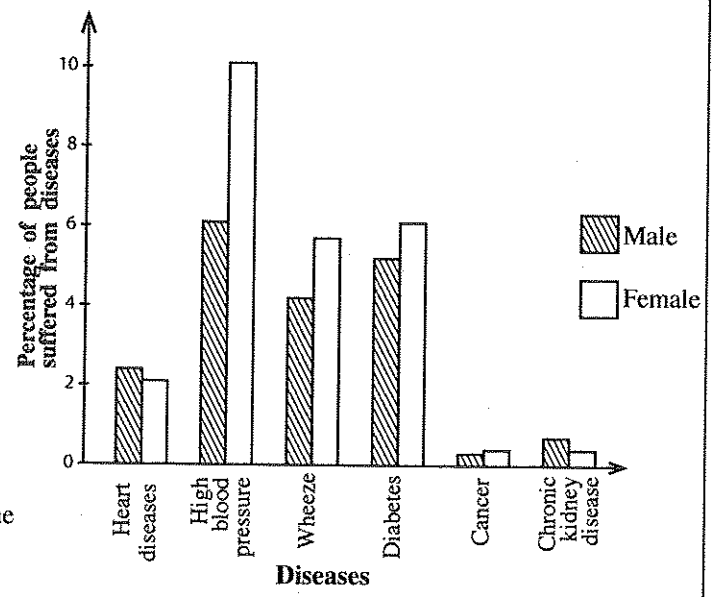
Index Number: .....

Instructions:

* ***Write your answers 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

1. The graph given here has been drawn considering several diseases, according to the data gathered from a census carried out recently in Sri Lanka on people who suffered from diseases.



(i) What is the category that all diseases stated in the graph generally belong to?

.....

(ii) Among the diseases given in the graph, from which disease do the most number of people suffer?

.....

(iii) According to the graph, which diseases are males more susceptible in comparison to the females?

.....

(iv) (a) From the diseases given in the graph, name a disease which has a high tendency to affect the humans by persistent organic pollutants. .....

(b) Write **two** special features of persistent organic pollutants.

.....

.....

(v) State a fact related to agriculture that is considered as a reason for the chronic kidney disease.

.....

(vi) One step that Sri Lanka has taken at present to control people getting subjected to certain diseases is given below.

Introducing a colour code for soft drinks to indicate their sugar content.

Which disease given in the graph is likely to be reduced to a great extent in the coming years due to the above action?

.....

[See page two

(vii) Write **two** bad habits that contribute for getting subjected to cancer.

.....

.....

(viii) Many diseases can be prevented by keeping the environment clean. Some items found in school environment which may cause environmental pollution are given below.

Broken test tubes, Plastic bottles, Batteries, Pen tubes,
Fluorescent bulbs, Envelopes, Filter papers

Classify the above items into **four** categories based on appropriate criteria, to make the waste management convenient for their disposal.

.....

.....

.....

.....

15

2. (*A*) Based on the structural features, vertebrates are classified into five groups. Consider the following table prepared in relation to it.

Vertebrate group	Pisces	**A**	**B**	Aves	**C**
Examples	Sea horse Skate	Toad Salamander	Tortoise Cobra	Jungle fowl Parrot	Bat Whale

(i) Name the vertebrate groups **A**, **B** and **C**.

A : ..... **B** : ..... **C** : .....

(ii) Name **two** cold blooded animals mentioned in the table.

.....

(iii) To which vertebrate group stated in the table do the humans belong? .....

(iv) Write **two** specific features related to flying, that belongs to vertebrates in Aves group.

.....

.....

(*B*) You are assigned to show experimentally, that oxygen gas is produced during photosynthesis.

(i) You are provided with the equipment and materials given below for the apparatus set-up relevant to the experiment. Draw a rough sketch of the set-up that you make using the given equipment.

A beaker, A boiling tube, A glass funnel, A hydrilla plant, Water

(ii) Write an observation that can be made when the set-up is exposed to sunlight.

.....

(iii) How would you confirm that the gas produced during this experiment is oxygen?

.....

(iv) Write the balanced chemical equation for the photosynthesis process.

.....

15

[*See page three*

3. (*A*) All the elements belonging to the second period of the periodic table are given below without following the correct order.

B Li C Be Ne F O N

(i) Arrange all the above elements as in the periodic table.

.....

(ii) Write the electronic configuration of F.

.....

(iii) (a) Write the chemical formula of the compound which is formed in the reaction between Li and O.

.....

(b) What is the type of chemical bond present in the compound stated in (a) above?

.....

(iv) In the given box, draw the **Lewis structure** of CO_2 molecule which is formed with the combination of one C atom and two O atoms.

(v) Diamond and graphite are main allotropic forms of C. Which of these allotropic forms conduct electricity?

.....

(vi) From the elements in this period, write respectively, the element which has the lowest first ionization energy and the element which has the highest electronegativity.

.....

(*B*) The following questions are based on an experiment on producing a sample of oxygen gas in the laboratory.

(i) Among the compounds given below, which compound can be used to produce oxygen gas?

$CaCO_3$, $KMnO_4$, $MgSO_4$: .....

(ii) What is the type of reaction that takes place during the production of oxygen gas when only the compound you stated above is used?

.....

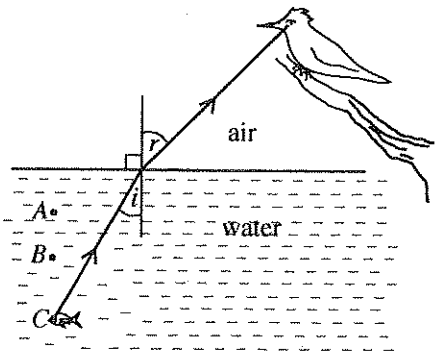
(iii) Which equipment must be used to place the compound to carry out the experiment?

.....

(iv) What is the name given to the method that is used in the laboratory, to collect oxygen gas produced in this experiment?

..... 15

4. (*A*) The figure shows a ray diagram relevant to a situation in which a fish in a pond is viewed by a kingfisher.



(i) Name the angles i and r shown in the ray diagram.

i - .....

r - .....

(ii) **Considering the two media** in the figure, state what is given by the constant $\frac{\sin i}{\sin r}$.

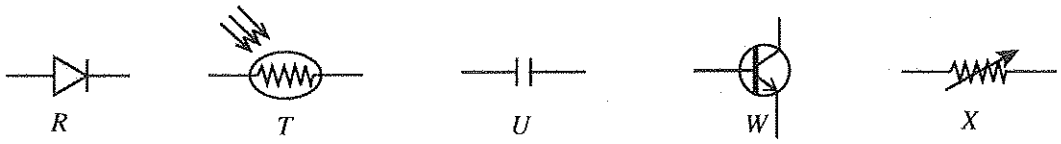
.....

(iii) Of the three positions *A*, *B* and *C*, at what position does the fish appear to the kingfisher?

.....

[*See page four*

(*B*) The standard symbols for some devices used in circuits are given below, labelled as *R*, *T*, *U*, *W* and *X*.



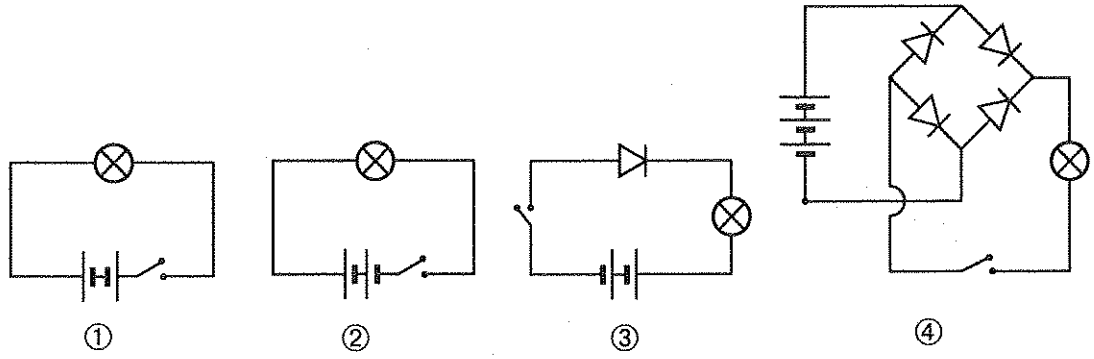
(i) Name the devices relevant to *T*, *W* and *X*.

T : .....

W : .....

X : .....

(ii) Four circuits constructed in the laboratory are given below as ①, ②, ③ and ④ with standard symbols. Cells of 1.5 V, Bulbs of 2.5 V, identical diodes and switches have been used in the circuits.



(a) State in the table below, whether the bulb lights up or does not light up when the switches in the circuits are closed,

Circuit	Bulb lights up / Bulb does not light up
①	
②	
③	
④	

(b) Write down, relating to potential difference, the conclusion that can be reached through your observations in ① and ② in (a) above.

.....

.....

(c) Removing the battery in the circuit ④ above and instead, an alternating voltage of suitable value is connected and the switch is closed. The wave pattern relevant to the input in this circuit is given in figure (a). Draw the corresponding output wave pattern in figure (b).

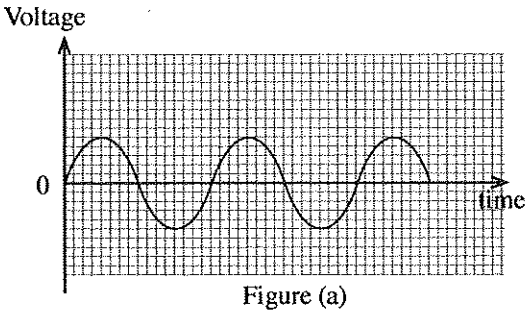


Figure (a)

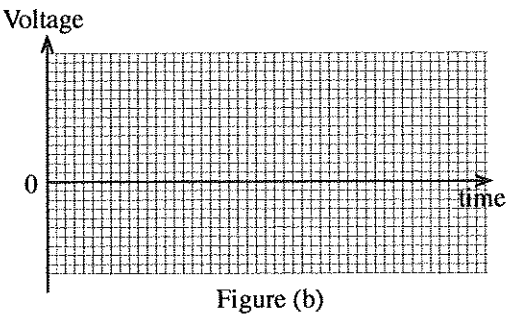


Figure (b)

(d) From the devices *T*, *U*, *W* and *X*, which can be used to smoothen the output current in the new circuit relevant to (c) above?

.....

15

* *

[*See page five*

Part B

● Answer **three** questions only, from questions No. **5**, **6**, **7**, **8** and **9**.

5. (*A*) Some components in the human blood are given below.

* Red blood cells
* White blood cells
* Platelets
* Proteins
* Glucose
* Ca^{2+}
* Urea

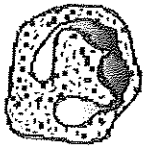
(i) Which blood cells are most abundant in blood?

(ii) Of the components given above,

(a) write **two** components that belong to blood plasma.

(b) state a nitrogenous waste material present in blood.

(iii) (a) Given below is a diagram of a blood cell that belongs to a certain type. To which component given above, does this cell belong?



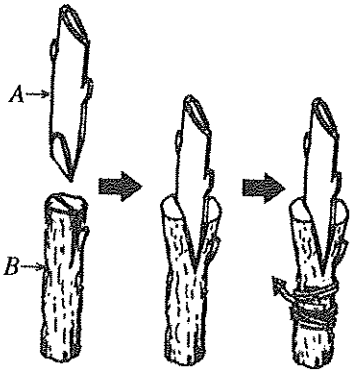
(b) State a function of the blood component to which the cell given in (a) above belongs.

(iv) (a) Write a disease associated with blood circulatory system of the human.

(b) In a person suffering from Dengue, which component decreases drastically?

(v) Briefly explain, the process of regulation of blood glucose level in human.

(*B*) (i) Steps of a plant grafting method are shown in the figure given below.



(a) What is the name given to the above grafting method?

(b) Write, respectively, the names given to parts *A* and *B*, according to this grafting method.

(c) Of the parts *A* and *B*, characteristics of which part does the daughter plant get?

(ii) Flower is the structure that contributes to sexual reproduction of plants.

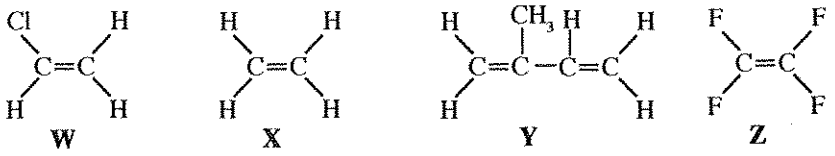
(a) Name the **three** parts that the gynoecium of a flower consists of.

(b) Write **two** changes that take place in a flower after fertilization.

(*Total marks* 20)

[*See page six*

6. (*A*) The structures **W**, **X**, **Y** and **Z** given below are the monomers of some polymers.

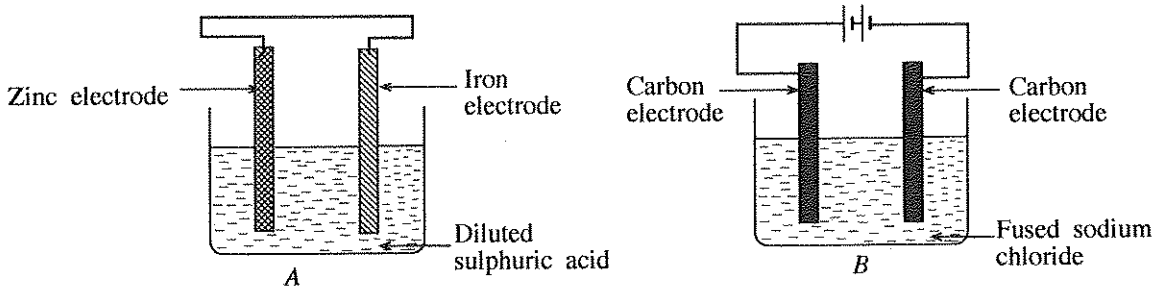


(i) State a derivative of ethene from the monomers **W**, **X**, **Y** and **Z**.

(ii) Name the polymers which are formed by the monomers **W**, **X** and **Y** respectively.

(iii) What is the natural polymer among the polymers that you stated in (ii) above?

(*B*) In the following figures, two cells are given as *A* and *B*.



(i) From the above two cells *A* and *B*, which is the electrolytic cell?

(ii) Write **one** observation that could be obtained when the cell *A* operates.

(iii) (a) Write the cathodic reaction that takes place in cell *B*.

(b) What is the name commonly given to the electrodes where oxidation reaction takes place in both cells?

(iv) What is the reason for **not** using cell *B* in the production of sodium metal, industrially?

(*C*) (i) Three instances relevant to separation of components from mixtures are given below.

① - Separation of various minerals from mineral sands

② - Separation of petroleum by the mineral oil refinery

③ - Obtaining distilled water from well water

Write the separation methods used in the instances ①, ② and ③ above, respectively.

(ii) Distilled water is commonly used as a solvent when preparing standard solutions in laboratory.

(a) Calculate the mass of sodium chloride required to prepare a 100 cm^3 of 1.00 mol dm^{-3} sodium chloride solution. (The molar mass of sodium chloride is 58.5 g mol^{-1}.)

(b) Write in order, the steps that are followed in the laboratory when preparing the sodium chloride solution mentioned in (a) above.

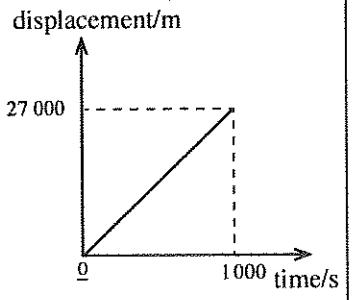
(*Total marks* 20)

7. It is necessary to be vigilant and obey road rules when using high ways.

(i) It is important for the driver as well as passengers to wear seat belts in the vehicle when travelling on high ways. What is the reason for this?

(ii) Write down the Newton's law of motion which is connected to the answer you mentioned in (i) above.

(iii) The displacement-time graph for the motion of the vehicle *A*, which travelled on an express way from the beginning to the end at the **maximum** permissible **velocity** is given here.



Here, it has been assumed that the express way is horizontal and it is in a straight line.

Answer the following questions using the graph.

(a) What is the length of the express way?

(b) Calculate the **maximum** permissible **velocity** that a vehicle can be driven in that express way.

[*See page seven*

(iv) In heavy rainy days, the drivers are advised to maintain 15 m s^{-1} as the **maximum velocity** for a vehicle that is driven on the express way mentioned in (iii) above.

(a) What is the main reason for advising the drivers **not** to drive the vehicles at a higher velocity when heavy rain exists?

(b) Explain scientifically, your answer in (a) above.

(c) On a heavy rainy day, the motion of the vehicle *B* which travelled from the beginning to the end of the express way mentioned in (iii) above was as follows.

It started from the rest and uniformly accelerated in the first 10 seconds and acquired **maximum velocity** (15 m s^{-1}). Thereafter it travelled at the same velocity for a certain time and in the last 10 seconds it uniformly decelerated and came to rest at the end of the express way.

Including the given information, draw a rough sketch of the velocity-time graph for the motion of vehicle *B*.

(d) Find the total time taken by vehicle *B* to travel on the express way.

(e) If the mass of the vehicle *B* is 3 000 kg, Find its momentum at the instance when it travelled in the maximum velocity.

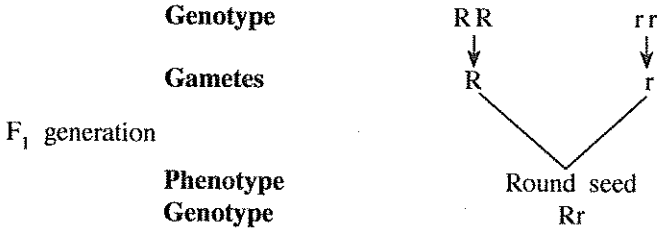
(v) When drivers are driving vehicles, it is important to pay attention to the side mirrors in front of the vehicles for the prevention of accidents.

(a) What type of curved mirrors are used as side mirrors of the vehicles?

(b) How does paying attention to those mirrors, contribute to prevent road accidents when the vehicles are driven?

(*Total marks* 20)

8. (*A*) A diagram relevant to the experiment carried out by Mendel on inheritance, using garden pea plant is given below.



(i) What are the contrasting characters used in this experiment?

(ii) In which step does meiosis occur during this process?

(iii) (a) According to the above experiment, show, using a diagram, how characters are inherited in a mono-hybrid cross of F_1 generation.

(b) Write the genotypes and corresponding phenotypes of the offsprings obtained in F_2 generation in the above cross.

(iv) Transmission of inherited characters to the next generation as stated above is common to all living organisms. Accordingly, explain briefly, the importance of not having marriages between blood relations.

(*B*) Several electric appliances used in a house are given below.

Television, Fluorescent lamp, Microwave oven, Immersion heater, Hot plate, Electric iron

(i) When some appliances mentioned above are used, it is necessary to use three pin plugs.

(a) From these appliances, name one appliance with which a three pin plug must be used.

(b) What is the importance of using a three pin plug for the appliance you mentioned in (a) above?

(ii) Write down a main energy form that the electric energy converts into, when the television operates.

(iii) Television is operated by a remote control.

(a) As what type of waves are the signals sent to the television by the remote control?

(b) Write **two** characteristics of the wave type that you have mentioned in (a) above.

[*See page eight*

(iv) The power of some appliances mentioned above are given in the following table.

Appliance	Power/W
A - Television	125
B - Fluorescent lamp	18
C - Microwave oven	1500
D - Electric iron	1200

In a certain day all these **four** appliances were operated during 1 hour and 30 minutes period.

(a) Arrange *A*, *B* *C* and *D* in the ascending order of the electric energy consumption during the time of operation. (Calculations are not expected)

(b) Calculate the electric energy consumed by *A* during that time.

(*Total marks* 20)

9. (*A*) The three solutions NaOH, HCl and NaCl of concentration 1.00 mol dm^{-3} are put separately into test tubes **A**, **B** and **C**.

(i) The tests carried out by a student to identify the solutions separately, and the observations made are given in the table below.

	Test	Observations
1.	Dipped red and blue litmus papers in the solution in tube **A**	● Blue litmus did not show any colour change ● Red litmus turned to blue
2.	Dipped red and blue litmus papers in the solution in tube **B**	● Red and blue litmus did not show any colour change

Mention the solutions in test tubes **A**, **B** and **C** respectively.

(ii) When 100 ml of each of the solutions NaOH and HCl stated above were mixed in a thermally insulated vessel, the temperature of the mixture rose up to 5 °C.

(a) Write the balanced chemical equation for the reaction between NaOH and HCl.

(b) Calculate the heat change associated with the reaction mentioned above. (Take the specific heat capacity of water as 4 200 J kg^{-1} $°C^{-1}$ and the density of water as 1 g cm^{-3}).

(iii) Write **two** assumptions that you made when determining the heat change associated with the reaction between NaOH and HCl stated above.

(*B*) The sun, atmosphere, land and the sea are natural resources.

(i) The sun's surface temperature is approximately 5 800 K.

(a) What is the surface temperature of sun in Celsius?

(b) In which heat transferring method does the heat transfer from sun to earth?

(c) Explain scientifically, how the sea breeze is formed in day time due to sun's heat.

(ii) In a certain day, the atmospheric pressure at sea level was 76 cm Hg and the atmospheric pressure at 10 km above sea level was 20 cm Hg.

(a) Name a laboratory instrument which is used to take the measurements of atmospheric pressure stated above.

(b) What is the reason for the pressure difference observed above?

(iii) Calculate the hydrostatic pressure at a place 2 km deep from the sea level. Take the density of sea water as 1050 kg m^{-3} and acceleration due to gravity as 10 m s^{-2}.

(*Total marks* 20)

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