නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

NEW 34 E I

இலங்கைப் பரீட்சைத் திணைக்களம்
Department of Examinations, Sri Lanka

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

[See page two

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

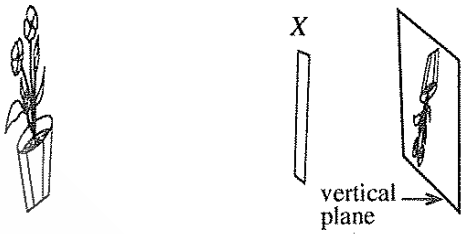
15. The endocrine glands that secrete glucagon and calcitonin in human body are respectively,
(1) pancreas and thyroid. (2) adrenal and thyroid.
(3) pituitary and adrenal. (4) thyroid and pancreas.

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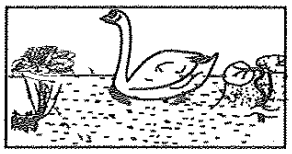
26. Which of the following is a function of human cerebellum?
(1) Maintaining the balance of the body
(2) Performing high mental activities
(3) Perception of visual stimuli
(4) Control of respiration

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

[See page four

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?

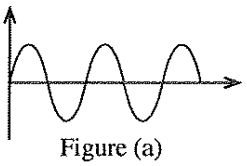
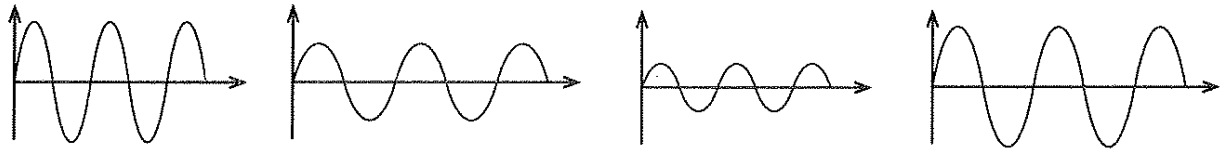


Figure (a)

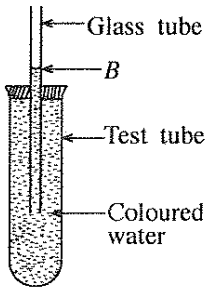


(1) (2) (3) (4)

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

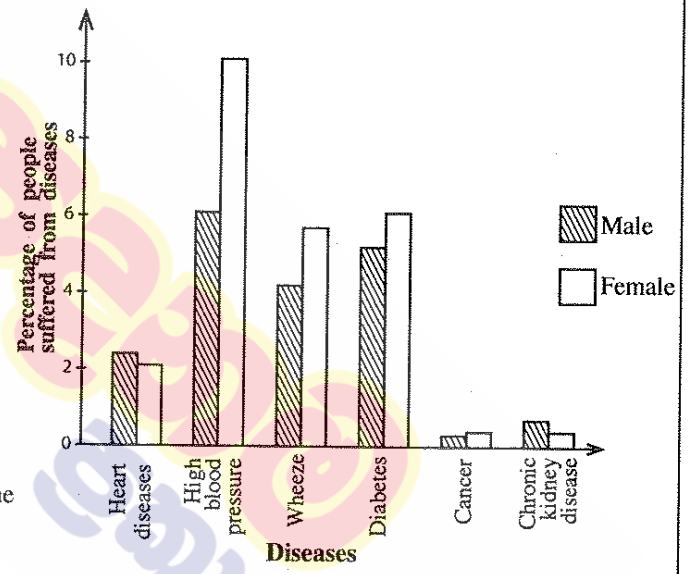
Index Number: .....

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.

.....

.....

.....

.....

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.

.....

[*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?

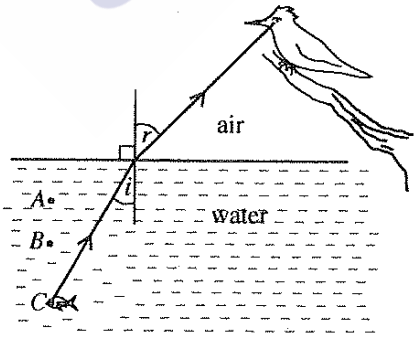
.....

(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 $\frac{\sin i}{\sin r}$.

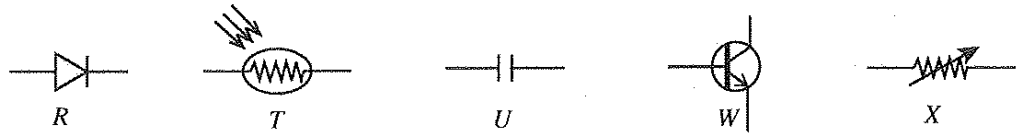
.....

(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*.



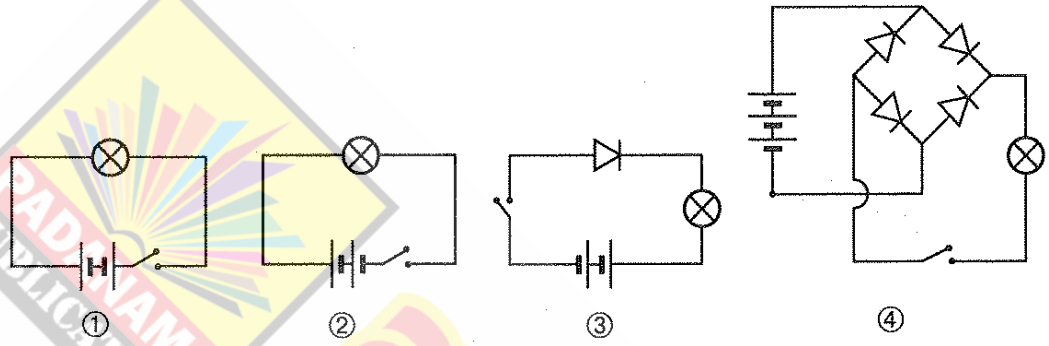
(i) Name the devices relevant to *T*, *W* and *X*.

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).

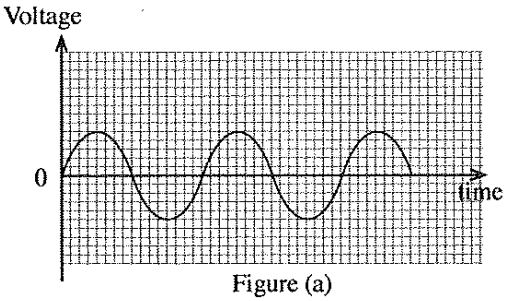


Figure (a)

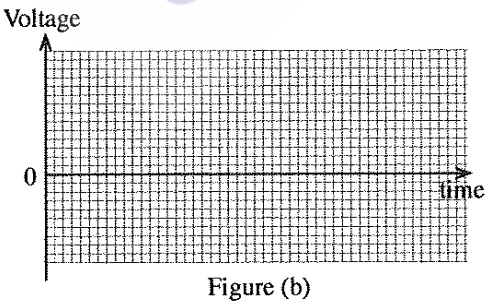


Figure (b)

(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?

.....

* *

[*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?

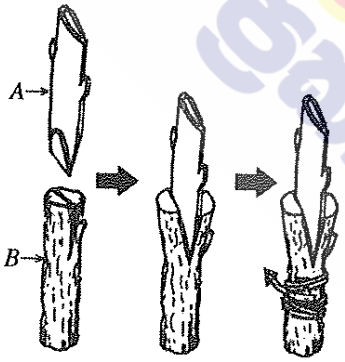
(b) State a function of the blood component to which the cell given in (a) above belongs.

(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.

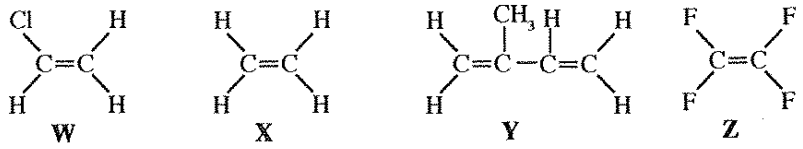
(a) Name the **three** parts that the gynoecium of a flower consists of.

(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.

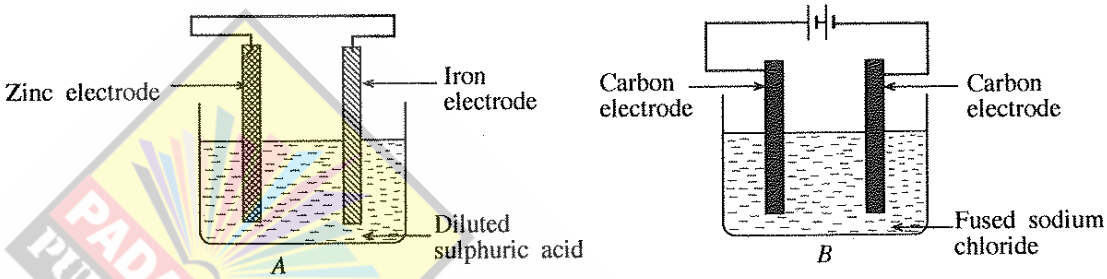


(i) State a derivative of ethene from the monomers **W**, **X**, **Y** and **Z**.

(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.

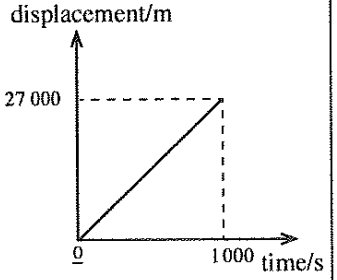
(*Total marks* 20)

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.

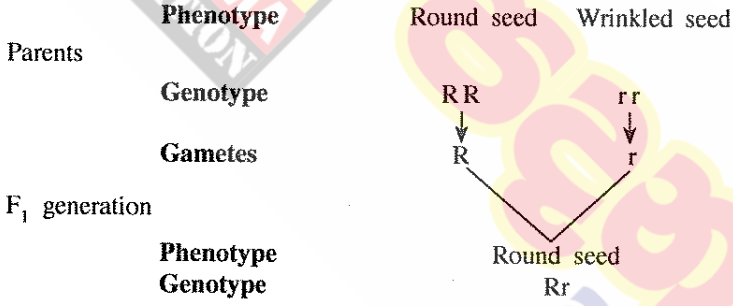
(v) When drivers are driving vehicles, it is important to pay attention to the side mirrors in front of the vehicles for the prevention of accidents.

(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)

* * *

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கைப் பரீட்சைத் திணைக்களம்

අ.පොස. (සා.පෙළ) විභාගය - 2017
க.பொ.த (சா.தர)ப் பரீட்சை - 2017

විෂයය අංකය
பாட இலக்கம் 34

විෂයය
பாடம் Science (New)

I පත්‍රය - පිළිතුරු
I பத்திரம் - விடைகள்

ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.
01.	4	11.	1	21.	1	31.	4
02.	3	12.	3	22.	2	32.	1
03.	2	13.	1	23.	4	33.	3
04.	4	14.	2	24.	1	34.	2
05.	2	15.	1	25.	2	35.	ALL
06.	1	16.	4	26.	1	36.	1
07.	3	17.	2	27.	4	37.	3
08.	3	18.	4	28.	3	38.	2
09.	2	19.	4	29.	2	39.	1
10.	2	20.	1	30.	3	40.	4

විශේෂ උපදෙස්
விசேட அறிவுறுத்தல்
එක් පිළිතුරකට ලකුණු
ஒரு சரியான விடைக்கு
02
බැගින්
புள்ளி வீதம்

මුළු ලකුණු / மொத்தப் புள்ளிகள் 02 × 40 = 80

පහත නිදසුනෙහි දැක්වෙන පරිදි බහුවරණ උත්තරපත්‍රයේ අවසාන තීරුවේ ලකුණු ඇතුළත් කරන්න.
கீழ் குறிப்பிடப்பட்டிருக்கும் உதாரணத்திற்கு அமைய பல்தேர்வு வினாக்களுக்குரிய புள்ளிகளை பல்தேர்வு வினாப்பத்திரத்தின் இறுதியில் பதிக.

නිවැරදි පිළිතුරු සංඛ්‍යාව சரியான விடைகளின் தொகை	25 40

I පත්‍රයේ මුළු ලකුණු பத்திரம் I இன் மொத்தப்புள்ளி	50 80

නව නිර්දේශයට හිමි / புதிய பாடத்திட்டம்/New Syllabus

NEW | 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

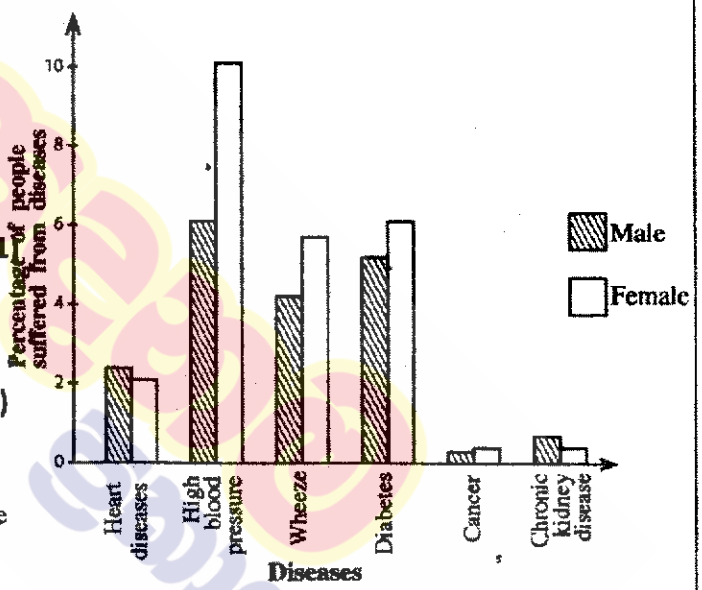
පැය තුනයි
மூன்று மணித்தியாலம்
Three hours

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?
non-communicable diseases / non infectious diseases ..... (01)

(ii) Among the diseases given in the graph, from which disease do the most number of people suffer?
High blood pressure (01)
.....

(iii) According to the graph, which diseases are males more susceptible in comparison to the females?
• Heart diseases (01) • Chronic kidney disease (01)
.....

(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.
Cancer/ Wheeze/ Chronic kidney disease (01)
.....

(b) Write two special features of persistent organic pollutants.
• Persist in the environment for a long time period • Highly toxic • Accumulate in the body of organisms along food chains/ Getting subjected to bio accumulation / Getting subjected to bio magnification • spread widely in the environment
(Two marks for any two ideas from above) (02)
.....

(v) State a fact related to agriculture that is considered as a reason for the chronic kidney disease.
Using pesticides/ insecticides/ weedicides/ Chemical fertilizers / Agro chemicals or Entering heavy metals/ Arsenic/ Lead/ Cadmium/ mercury to the body
Answer with any above ideas (01)
.....

(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?

• Diabetes (01)
.....

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

• Smoking / Chewing betel/ Using tobacco/ Using junk food/ Using alcohol/ Not following relevant protective methods (in various instances) / Burning garbage/ Using artificial cosmetics/ Using drugs ..... 02 marks for any 2 acceptable reasons (02)

(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.

Naming any 4 groups or classifying in to any 4 groups (04)

when the question is attempted , give 02 marks

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 : Amphibians/Amphibia (01) B : Reptiles/ reptilia (01) C : Mammals/ Mammalia (01)

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

Give 02 marks if the answer is mentioned or not (02)

(iii) To which vertebrate group stated in the table do the humans belong? mammalia/ mammals/C (01)

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

• Having a very light endoskeleton

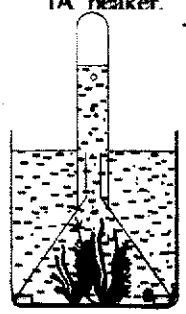
• Streamlined body shape

• Forelimbs are modified to wings/ having wings ... 02 marks for any 2 features (02)

(*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



- Covering the plant by the funnel and the tube such that gas collected or Covered the plant by the tube only (02)
- Presence of water (01)

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

• air/ gas bubbles are emitted (by the plant hydrilla) / decreasing the water level of boiling tube/ collecting a gas at the top of the boiling tube ..... one mark for any one of them (01)

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

• Brighten the glowing splinter when inserted the tube (after removing water from the tube)/ the splinter will burn with a bright flame ..... (give marks for an observation equal to this) (01)

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

$6CO_2(g) + 6H_2O(l) \xrightarrow[\text{chlorophyll}]{\text{Light/Sunlight/ hv}} C_6H_{12}O_6(s) + 6O_2(g)$ for balanced equation (01)

mentioning light/ sunlight/ hv and chlorophyl (01)

not necessary to mention physical states

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.

Li , Be, B, C, N, O, F, Ne (02)

Give 01 mark if any 4 elements are shown in their correct positions

(ii) Write the electronic configuration of F.

2, 7 (01)

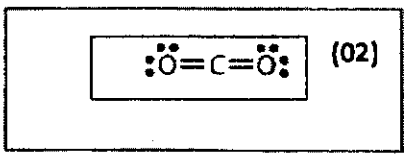
(iii) (a) Write the chemical formula of the compound which is formed in the reaction between Li and O.

Li_2O (02)

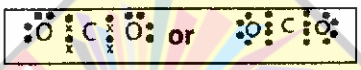
(b) What is the type of chemical bond present in the compound stated in (a) above?

Ionic bonds (01)

(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.



(02)

drawing  give 01 mark

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

Graphite (01)

(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.

Li , F / Lithium, Fluorine (02)

(*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?

$CaCO_3$, $KMnO_4$, $MgSO_4$: $KMnO_4$ (01)

(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?

decomposition (reactions)/ Chemical decomposition (reactions) (01)

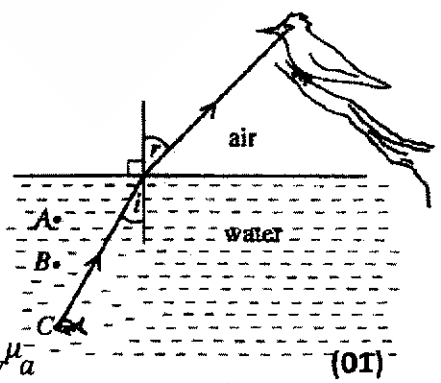
(iii) Which equipment must be used to place the compound to carry out the experiment?

Boiling tube / test tube (01)

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

downward displacement of water (01)

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 - angle of incidence (01)

r - angle of refraction (01) (02)

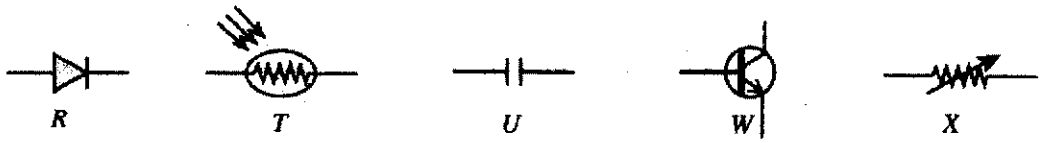
(ii) **Considering the two media** in the figure, state what is given by the constant $\frac{\sin i}{\sin r}$.

refractive index of air relative to water / $w^n a$ / $w^\mu a$ (01)

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

B (01)

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



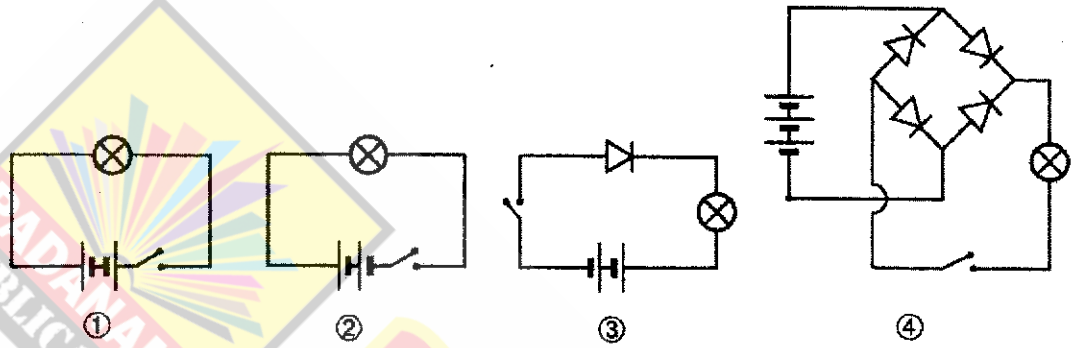
(i) Name the devices relevant to *T*, *W* and *X*.

T : Light dependent resistor / LDR ..... (01)

W : Transistor (npn) ..... (01)

X : Variable resistor / Rheostat/ Volume controller (01)

(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,

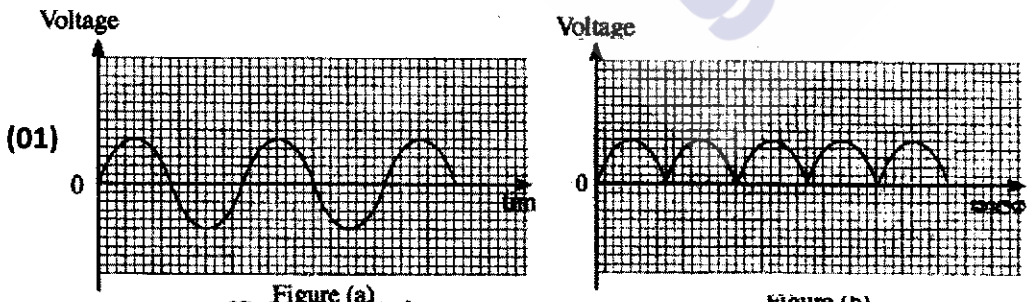
Circuit	Bulb lights up / Bulb does not light up
①	does not light up (01)
②	lights up (01)
③	does not light up (01)
④	lights up (01)

(04)

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

A potential difference is not supplied to flow a current to light up the bulb in the circuit. ①/ Potential difference is Zero. (01)/Bulb in the circuit ② lights up due to the flow of current as potential difference is supplied.(01)/ It is necessary to have a potential difference for the flow of current (02)

(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).



(01)

shape and two curves are sufficient (01)

(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?

U / Capacitor / condenser (01)

* *

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?

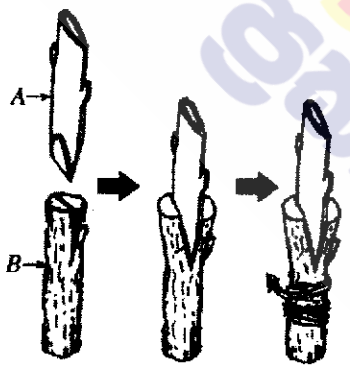
(b) State a function of the blood component to which the cell given in (a) above belongs.

(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.

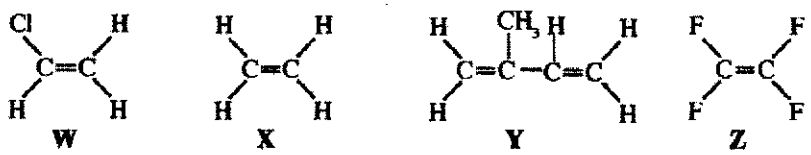
(a) Name the **three** parts that the gynoecium of a flower consists of.

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

(*Total marks* 20)

⑤	(A) (i)			Red blood cells / RBC	01
		(ii)	(a)	Proteins/ glucose/ Ca^{2+}/ urea **one mark for one answer**	02
			(b)	Urea	01
		(iii)	(a)	White blood cells	01
			(b)	Protecting the body from diseases/ Engulfing pathogens / immunization/ producing antibodies **any answer which gives any of the above ideas**	01
		(iv)	(a)	Artherosclerosis / hypotension / high blood pressure / hypertension/ Low blood Pressure / thrombosis/ coronary thrombosis/ heart attack	01
			(b)	(blood) platelets	01
		(v)		**when the glucose level is increased,** Insulin is secreted (by the islets of langerhan) and then glucose is converted into glycogen. /Increase the metabolic reactions **(01).** Then blood glucose level is regulated. **when the glucose level is decreased,** Glucogon is secreted (by the islets of langerhan) and (deposited) glycogen is converted into glucose/ Decrease the rate of metabolic reactions **(01).** Blood glucose level is regulated	02
	(B)	(i)	(a)	twig grafting / peg grafting	02
			(b)	A - scion (01) B - stock (01) or mentioning scion and stock respectively (02)/ if only scion has been written, give (01) mark	02
			(c)	Characteristics of A/ Characteritics of the scion	01
		(ii)	(a)	Ovary , Style , Stigma **(01) (01) (01)**	03
			(b)	• Ovary develops to form the fruit • sepals , petals, stamens and stigma are worn out • (Fertilized) ova develop to seeds • wall of the ovary becomes the pericarp • wall of the ovule becomes the seed coat **one mark each for any fact with the above ideas**	02
				Total marks	**20**

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

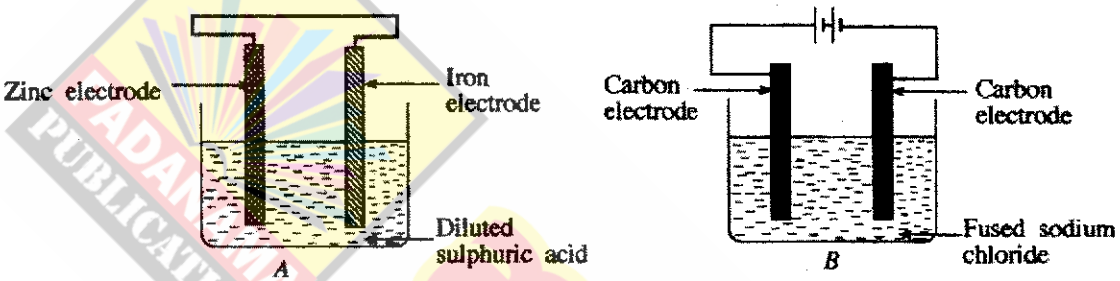


(i) State a derivative of ethene from the monomers **W**, **X**, **Y** and **Z**.

(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)

⑥	(A)	(i)		W/Z or chloroethene / tetrafluoroethene	01
		(ii)		W- polyvinyl chloride / polychloroethene / PVC (01) X - polythene / polyethene / polyehylene (01) Y - Rubber / natural rubber / polyisoprene (01)	03
		(iii)		Rubber / natural rubber / polyisoprene	01
	(B)	(i)		B	01
		(ii)		• liberation of gas bubbles at the iron electrode • Dissolving/ decaying / getting eroded the Zinc electrode • the cell is getting heated ***for any observation***	01
		(iii)	(a)	$Na^+(\ell) + e \longrightarrow Na(S)$ **(Physical state is not essential)**	02
			(b)	Anode	01
		(iv)		NaCl could be formed by the reaction of Cl_2 gas produced at the anode and Na discharged at the cathode/ as Na is highly reactive/ Na and Cl_2 can react again	01
	(C)	(i)		① physical method/ mechanical separation/ any relevant physical method (like filtering and magnetic separation) ② fractional distillation ③ simple distillation	03
		(ii)	(a)	Mass of NaCl required to prepare a 1000 cm^3 solution of 1mol dm^{-3} = 58.5 g Mass of NaCl required to prepare a 1cm^3 solution of 1mol dm^{-3} = $\frac{58.5\ g}{1000}$ Mass of NaCl required to prepare a100cm^3 solution of 1mol dm^{-3} = $\frac{58.5}{1000}$ X 100 g (01) = 5.85 (g) (01) **Give marks for the calculation using n=cv**	02
			(b)	• measuring the mass (5.85 g) of NaCl (accurately using a triple beam balance) (01) • putting measured NaCl completely into a volumetric flask (of 100 cm^3) (01) • dissolving NaCl well by filling about the half of the flask with water. (01) • adding / mixing by adding water upto the final voulme of 100 cm^3 (01)	04
				Total marks	**20**

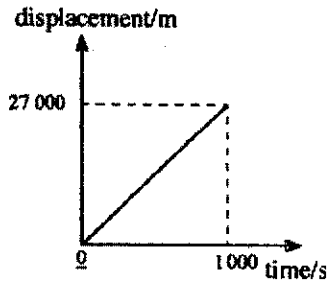
7. It is necessary to be vigilant and obey road rules when using high ways.

(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.

(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.

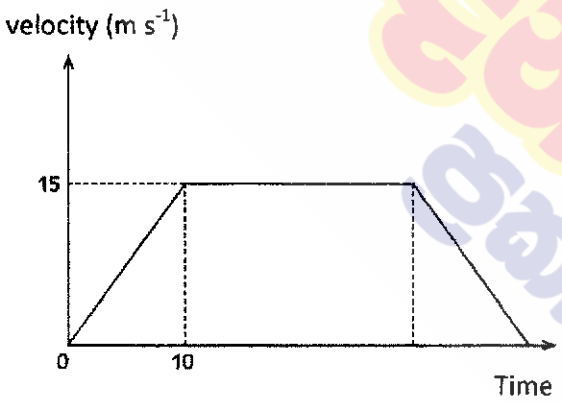
(e) If the mass of the vehicle *B* is 3 000 kg, Find its momentum at the instance when it travelled in the maximum velocity.

(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?

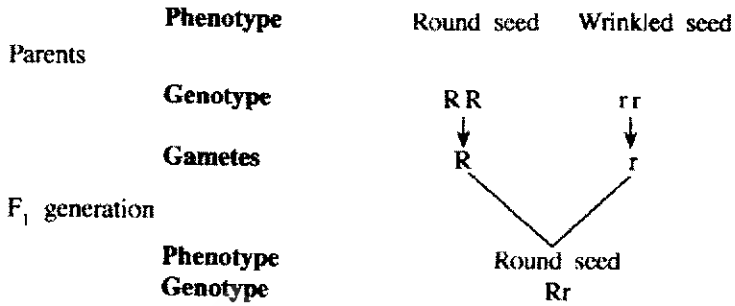
(b) How does paying attention to those mirrors, contribute to prevent road accidents when the vehicles are driven?

(*Total marks* 20)

⑦		(i)		When the vehicle is moving , the driver and the passengers have the same velocity of the vehicle. Therefore to prevent the driver and the passengers moving forward upon applying brakes (the seat belts should be worn) any answer with the idea of preventing the driver and the passengers moving forward upon applying brakes.	01
		(ii)		Newton's first law / Newton's third law / writing the law with the real meaning	02
		(iii)	(a)	27 000(m) / 27 km	01
			(b)	velocity = $\frac{\text{displacement}}{\text{time}}$ **or** = $\frac{27000(m)}{1000(s)}$ (01) = 27 ($m\ s^{-1}$) (01)	02
		(iv)	(a)	prevent the vehicle from slipping / prevent from accidents (01)	01
			(b)	The possibility of accidents is high due to reducing the friction (frictional force) between the tyres of the vehicle and the road when raining. **For any answer with the idea of reducing friction**	02
			(c)	 • lebelling the axes / Naming the axes as V and t **(01)** • shape of the graph **(01)** • marking the velocity 15 ($m\ s^{-1}$) and time 10 (s) **(01)** **Give one mark for drawing and labelling the two axes without drawing the graph**	03

			(d)	total distance travelled by the vehicle = area under the graph = area of the trapezium **or** $27000 = \frac{1}{2}(10 + t + 10 + t) \times 15$ (01) $t = 1790\ (s)$ (01) Total time $= 1790 + 20$ $= 1810\ (s)$ (01)	03
			(e)	momentum = mass × velocity **or** momentum = mv **or** $= 3000\ (kg) \times 15(m\ s^{-1})$ (01) $= 45000\ (kg\ m\ s^{-1})$ (01)	02
	(v)	(a)		convex mirror	01
		(b)		• Larger area behind the vehicle can be seen well • Larger area can be viewed through convex mirror at once • Always upright images can be seen • The image distance is smaller than the object distance **For any answer with a brief explanation**	02
				Total marks	**20**

5. (*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.

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

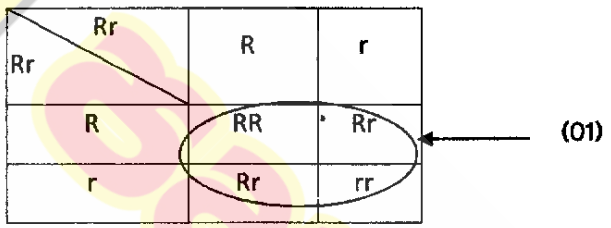
Appliance	Power/W
A - Television	125
B - Fluorescent lamp	18
C - Microwave oven	1500
D - Electric iron	1200

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)

⑧	(A)	(i)		• round seeds (01) • wrinkled seeds (01)	02
		(ii)		When forming the gametes	01
		(iii)	(a)	(F_1 genotype) Rr Rr (01) (gametes) R r R r (01) (F_2 generation) (01) RR Rr Rr rr **or** Mentioning R, r (01) (01)  (01) 	03
			(b)	round seeds : RR, Rr (02) **or** : RR - round seeds (01) Rr - round seeds (01) wrinkled seeds : rr - (01) rr - wrinkled seeds (01) **If phenotypes are written in part (a), give marks relevant for part (b)**	03
		(iv)		• Hidden recessive genes/ characterists become prominent (due to the marriage of blood relations) (01) • so, there is more tendancy for hereditary diseases to become prominant (01)	02
	(B)	(i)	(a)	• microwave oven • hot plate • immersion heater • electric iron **for any answer**	01
			(b)	prevent from accidents due to leakage of electricity / for earthening a short circuit current	01

	(ii)		• light (energy) • sound (energy) • heat (energy) • radiation (energy) **for any answer**	01
	(iii)	(a)	• Infra red rays/ IR rays / electromagnetic waves	01
		(b)	• Do not require a medium for propagation • Travel at a speed of 3×10^8 m s^{-1} in vacuum • Not affected by external electric and magnetic fields • No charge • Type of transverse waves • invisible • Frequency is in the range 10^{12}Hz - 10^{14}Hz approximately / Wave lenght is in the range 10^{-6} m - 10^{-3} m approximately **for any two from the above**	02
	(iv)	(a)	B, A, D, C / B < A < D < C If the answer has been given with appliances, award marks	01
		(b)	$E = Pt$ **or** Consumed electric energy $= \frac{125}{1000} \times \frac{3}{2}$ (01) $= \frac{375}{2000}$ $= \frac{3}{16}$ kWh/0.19kWh (01) $E = Pt$ **or** $E = 125 \times 1.5 \times 60 \times 60$ (01) $= 675000$ J **or** $= 675$ kJ (01)	02
			Total marks	**20**

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

(i) The tests carried out by a student to identify the solutions separately, and the observations ma 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 chang ● 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 colo 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 therma 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 h 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 reacti 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 press at 10 km above sea level was 20 cm Hg.

(a) Name a laboratory instrument which is used to take the measurements of atmospheric press 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 sea water as 1050 kg m^{-3} and acceleration due to gravity as 10 m s^{-2}.

(*Total marks* 2

⑨	(A)	(i)		A - NaOH (01) B - NaCl (01) C - HCl (01) **or** NaOH, (01) NaCl, (01) HCl (01)	03
		(ii)	(a)	$NaOH + HCl \longrightarrow NaCl + H_2O$	02
			(b)	$Q = mc\theta$ (01) $= \frac{200}{1000} \times 4200 \times 5$ (01) $= 4200\,J$ **or** $4.2\,kJ$ **or** heat change = $-4200\,J$ **or** $-4.2\,kJ$ (01)	03
		(iii)		• No any heat loss / the whole amount of heat produced is used to increase the temperature of the solution • the specific heat capacity of the solution is equal to the specific heat capacity of water • Density of the solution is equal to the density of water **any 2 from above**	02
	(B)	(i)	(a)	(5800 - 273) = 5527 (^{0}C) **or** (5800 - 273.15) = 5526.85 (^{0}C)	01
			(b)	by radiation	01
			(c)	During the day time, the land surface get heated more relative to the sea (01). Then air near the land surface warms up and move upwards (01). Threrfore (the air pressure closer to the land is low) an air current flows from the sea to the land (01).	03
		(ii)	(a)	barometer / aneroid barometer / mercury barometer	01
			(b)	The height of the air layer that is 10 km above the sea level is lesser than the air layer closer to the sea level/ The pressure get decresed when the height of the air layer decreases / The pressure get decreased when going up from the sea level as the height of the air column decreases.	01

		(iii)		pressure = hρg (01) = 2 × 1000 (m) × 1050 (kg m $^{-3}$) × 10 (m s $^{-2}$) (01) = 1050 × 20 × 1000 = 21000000 (Pa) **or** = 21 × 10^6 (Pa) (01)	03
				Total marks	**20**

10 සහ 11 ශ්‍රේණි සඳහා ග්‍රන්ථ නාමාවලිය

(අ.පොෂ.ස) සාමාන්‍ය පෙළ 11 ශ්‍රේණිය - කෙටි සටහන්

සිංහල මාධ්‍ය

- [ ] 10-11 සිංහල ව්‍යාකරණ
- [ ] 10-11 සිංහල සාහිත්‍යය රසාස්වාදය
- [ ] බුද්ධ ධර්මය
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- [ ] සිංහල භාෂාව හා සාහිත්‍යය
- [ ] සිංහල සාහිත්‍යය සංග්‍රහය
- [ ] English Language
- [ ] ගණිතය - 1
- [ ] ගණිතය - 2
- [ ] ජීව විද්‍යාව
- [ ] භෞතික විද්‍යාව
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- [ ] ව්‍යාපාර හා ගිණුම්කරණ අධ්‍යයනය
- [ ] භූගෝල විද්‍යාව
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- [ ] නර්තනය
- [ ] නාට්‍ය හා රංග කලාව
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- [ ] සන්නිවේදනය හා මාධ්‍ය අධ්‍යයනය
- [ ] සෞඛ්‍යය හා ශාරීරික අධ්‍යාපනය
- [ ] කෘෂි හා ආහාර තාක්ෂණය
- [ ] ගෘහ ආර්ථික විද්‍යාව

11 ශ්‍රේණිය - ප්‍රශ්නෝත්තර

සිංහල මාධ්‍ය

- [ ] සිංහල භාෂාව හා සාහිත්‍යය
- [ ] බුද්ධ ධර්මය
- [ ] ඉතිහාසය
- [ ] ව්‍යාපාර හා ගිණුම්කරණ අධ්‍යයනය
- [ ] පුරවැසි අධ්‍යාපනය

Grade 11 - Short Notes

English Medium

- [ ] Buddhism
- [ ] Mathematics - 1
- [ ] Mathematics - 2
- [ ] Biology
- [ ] Physics
- [ ] Chemistry
- [ ] History
- [ ] Business & Accounting Studies
- [ ] Geography
- [ ] Civic Education
- [ ] ICT
- [ ] Health & Physical Education
- [ ] 10-11 English Literary (Poetry)
- [ ] 10-11 English Literary (Drama)
- [ ] 10-11 English Literary (Short Story)

Grade 11 - Model Papers

English Medium

- [ ] Civic Education

10 ශ්‍රේණිය - කෙටි සටහන්

සිංහල මාධ්‍ය

- [ ] බුද්ධ ධර්මය
- [ ] කතෝලික ධර්මය
- [ ] සිංහල භාෂාව හා සාහිත්‍යය
- [ ] සිංහල සාහිත්‍යය සංග්‍රහය
- [ ] සිංහල රචනා අත්වැල
- [ ] English Language
- [ ] ගණිතය - 1
- [ ] ගණිතය - 2
- [ ] ජීව විද්‍යාව
- [ ] භෞතික විද්‍යාව
- [ ] රසායන විද්‍යාව

- [ ] ඉතිහාසය
- [ ] ඉතිහාසය රූප සටහන් අශ්‍රිත කෙටි සටහන්
- [ ] ව්‍යාපාර හා ගිණුම්කරණ අධ්‍යයනය - 1
- [ ] ව්‍යාපාර හා ගිණුම්කරණ අධ්‍යයනය - 2
- [ ] භූගෝල විද්‍යාව
- [ ] පුරවැසි අධ්‍යාපනය
- [ ] පෙරදිග සංගීතය
- [ ] නර්තනය
- [ ] නාට්‍ය හා රංග කලාව
- [ ] චිත්‍ර කලාව
- [ ] තොරතුරු හා සන්නිවේදන තාක්ෂණය
- [ ] සන්නිවේදනය හා මාධ්‍ය අධ්‍යයනය
- [ ] සෞඛ්‍යය හා ශාරීරික අධ්‍යාපනය
- [ ] කෘෂි හා ආහාර තාක්ෂණය
- [ ] ගෘහ ආර්ථික විද්‍යාව
- [ ] ජපන් භාෂාව

10 ශ්‍රේණිය - ප්‍රශ්නෝත්තර

සිංහල මාධ්‍ය

- [ ] සිංහල භාෂාව හා සාහිත්‍යය
- [ ] බුද්ධ ධර්මය
- [ ] ගණිතය
- [ ] විද්‍යාව
- [ ] ඉතිහාසය
- [ ] පුරවැසි අධ්‍යාපනය
- [ ] භූගෝල විද්‍යාව
- [ ] පෙරදිග සංගීතය

පාඩමෙන් පාඩමට මාසික ඇගයීම්

සිංහල මාධ්‍ය

- [ ] 10-ශ්‍රේණිය - විද්‍යාව
- [ ] 11-ශ්‍රේණිය - විද්‍යාව

Grade 10 - Short Notes

English Medium

- [ ] Buddhism
- [ ] Mathematics - 1
- [ ] Mathematics - 2
- [ ] Biology
- [ ] Physics
- [ ] Chemistry
- [ ] History
- [ ] Business & Accounting Studies - 1
- [ ] Business & Accounting Studies - 2
- [ ] Geography
- [ ] Civic Education
- [ ] ICT
- [ ] Health & Physical Education

Grade 10 - Model Papers

English Medium

- [ ] Mathematics
- [ ] Science
- [ ] Civic Education
- [ ] Geography
- [ ] English Activity Book
- [ ] English Work Book

අනෙකුත් ග්‍රන්ථ

- [ ] හෙළදිව කතිකාවත - අරුණශාන්ත අමරසිංහ
- [ ] හොල්මන් අවතාර සහ යකඳුරන් - අරුණශාන්ත අමරසිංහ
- [ ] සිසු-ගුරු අත්පොත නාට්‍ය හා රංග කලාව 10-11 ශ්‍රේණි සඳහා (නව විෂය නිර්දේශය) - නන්දන අල්ගේවත්ත

සියලු ම ශ්‍රේණි සඳහා කෙටි සටහන්, ප්‍රශ්න පත්‍ර කට්ටල සහ වැඩ පොත් අප සතුව තිබෙන අතර, මෙම ඕනෑම ග්‍රන්ථයක් වට්ටම් සහිත ව ඔබේ නිවසට ම ගෙන්වා ගත හැකි ය.