

20. Which of the following is **not** a requirement for an object to be in equilibrium under three parallel forces?
1. The three forces must be coplanar.
 2. One force must act in opposite to the other two forces.
 3. The resultant of any two forces must be equal in magnitude and opposite in direction to the third force.
 4. A parcel placed on a table is in equilibrium under three forces.
21. An object placed on a horizontal plane is pulled to the South by the force of 20N. The force that must be applied to bring the object to rest is,
1. 20 N to South
 2. 10 N to South
 3. 20 N to North
 4. Any force in any direction
22. What is the instance when an unbalanced force **does not** act?
1. When a vehicle stops by using brakes.
 2. When an object is at rest on the ground.
 3. When an object moves with an increasing velocity.
 4. When an object moves up a hill.
23. The correct representation of the scientific name of the coconut plant is,
1. COCOS NUCIFERA
 2. Cocos Nucifera
 3. Cocos nucifera
 4. *Cocos nucifera*
24. Which of the following organism is **not** an example for a protist?
1. Ulva
 2. Paramecium
 3. Penicillium
 4. Amoeba
25. Consider the following statements and reasons.
- Statement** - Plant bodies that do not produce seeds are called thallus.
- Reason** - There are plants that have no tissue differentiation such as stems, roots or leaves.
- Select the most correct answer.
1. Both the statement and reason are true.
 2. The statement is true and the reason is false.
 3. Both the statement and the reason are false.
 4. The statement is true and the reason explains the statement.

• **Questions 26 and 27 are based on the animals mentioned below.**

♦ Hydra ♦ Earthworm ♦ Squid ♦ Snail

26. Animals that belong to the same phylum are,
1. Squid, snail
 2. Earthworm, Snail
 3. Hydra, Squid
 4. Hydra, Earthworm
27. The animal whose body is divided into segments externally and internally, is,
1. Earthworm
 2. Hydra
 3. Snail
 4. Squid
28. Select a thing that is **not** exchanged between mother and fetus through the umbilical cord.
1. Oxygen
 2. Nutrients
 3. Blood
 4. Pathogens
29. When an egg is produced, the various structures that can be seen in an ovum are shown in the following flowchart.

Primary follicle → Graafian follicle → Corpus luteum → Corpus albicans

An egg is released from the ovary in which of the above instance?

1. Primary follicle
 2. Graafian follicle
 3. Corpus luteum
 4. Corpus albicans
30. Sexually transmitted diseases, which are transmitted by bacteria and viruses respectively, are,
1. Gonorrhoea, Herpes
 2. AIDS, Syphilis
 3. Herpes, AIDS
 4. Herpes, Gonorrhoea
31. An instance in which atmospheric pressure is **not** used,
1. When drinking a drink using a straw.
 2. In the (fluid) brake system of vehicles.
 3. In removing water from a tank by siphon method.
 4. In the action of the rubber sucker.
32. The atmospheric pressure at sea level is 76 cmHg. If the density of mercury is 13600 kgm^{-3} and the gravitational acceleration is 10 ms^{-2} , find the atmospheric pressure in Pascals.
1. $76/100 \times 13600 \times 10$
 2. $13600/76 \times 10$
 3. $76 \times 100 \times 13600 \times 10$
 4. $76 \times 13600 \times 10$
33. The values of x and y to balance this reaction are,
- $$x\text{Al} + 6\text{HCl} \rightarrow 2\text{AlCl}_3 + y\text{H}_2$$
1. 3, 2
 2. 6, 2
 3. 2, 3
 4. 3, 3
34. Which of the following is a chemical decomposition reaction?
1. $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$
 2. $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
 3. $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$
 4. $\text{BaCl}_2 + \text{Na}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + 2\text{NaCl}$
35. A certain object weight 5 kg. When it moves at a speed of 6 ms^{-1} , the kinetic energy is,
1. 15 J
 2. 30 J
 3. 48 J
 4. 90 J
36. The catalyst used in the production of nitric acid from oxidation of ammonia is,
1. Porous Iron
 2. Nickel
 3. Platinum
 4. Vanadium pentoxide
37. Which factor **does not** affect the resistance of a conductor?
1. Density of the conductive substance
 2. Length of the conductor
 3. Type of substance the conductor made of
 4. Cross sectional area of the conductor
38. Four quantities related to electricity and their unit of measurement is given below. Which of the following is **not** matching with the given quantities?
1. Potential difference – Volt (V)
 2. Electro motive force – Watt (W)
 3. Resistance – Ohm (Ω)
 4. Electric current – Ampere (A)
39. An inherited characteristic that is **not** seen rarely, is,
1. Syndactyly
 2. Albinism
 3. Polydactyly
 4. Ability to fold the tongue
40. A disease most likely to cause due to mosquito bites during the afternoon is,
1. Malaria
 2. Elephantiasis
 3. Dengu
 4. Encephalitis

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වර්ෂ අවසාන ඇගයීම ஆண்டு இறுதி மதிப்பீடு - 2022 (2023 මාර්තු) Year End Evaluation			
ශ්‍රේණිය } தரம் } 10 Grade }	විෂය } பாடம் } විද්‍යාව Subject } Science	පත්‍රය } வினாத்தாள் } II Paper }	පැය } மணித்தியாலம் } 03 Hours }
Name :			

- Write answers in clear handwriting.
- Answer all the four questions in that section in the space provided.
- Answer any three questions of your choice from Part B.
- Provide the answers and finally submit the answer sheets of part A and part B together.

Part A – Structured essay

01) A) Following figure shows some of the organisms that live in a forest environment.



- i. Which element is most abundant in the bodies of living things? (m. 01)
.....
- ii. Name two vertebrates live in the above environment (m. 01)
1.....2.....
- iii. Plants living here produce food through photosynthesis.
 - (a) Mention two characteristics shown by plants only. (m. 02)
1..... 2.....
 - (b) What is the domain that plants are included in classifying plants (m. 01)
.....
- iv. Write two groups of micro-organisms that help in the decomposition process of those bodies, after the organisms found in this environment die. (m. 01)
.....

- B) i. What type of biomolecule is formed by combining the elements Hydrogen, Oxygen, Nitrogen, and possibly Sulfur? (m. 01)

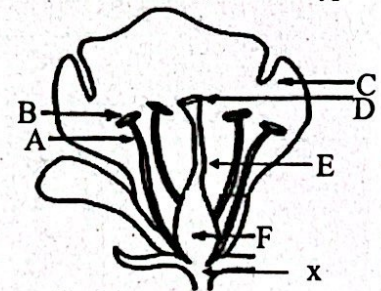
 ii. What is the building block of above-mentioned biomolecules? (m. 01)

 iii. A group of students designed an activity to show that the biomolecule you mentioned above contains in the living matter. Name two materials that could be used for the activity. (m. 01)
 1. 2.
 iv. Name two chemicals they must obtain for the activity. (m. 02)
 1. 2.
 v. What are the colours of those chemicals? (m. 01)
 1. 2.
 vi. What observation would be received if the activity was performed correctly? (m. 01)

- C) Vitamins are needed to maintain the vital functions of organisms.
 i. Write down the vitamin that causes the following deficiency symptoms. (m. 1 x 2 = 2)
 (a) Delays blood clotting -
 (b) Night blindness with bito spots in the eyes -

02. (A) The flower is the organ for sexual reproduction in a flowering plant. Given here is a diagram of a typical flower.

- i. What is th 'X' structure in which the parts of a flower are arranged in a whorl? (m. 01)



- ii. Mention the letters related to the parts of androecium in this diagram. (m. 01)

- iii. Mention the letters related to the parts of gynoecium in this diagram. (m. 02)

- iv. Is the above flower unisexual or bisexual? What is the reason for your answer? (m. 01)

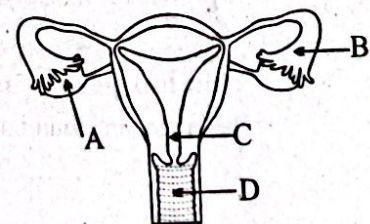
- v. Write two adaptations present in 'C' to prevent self-pollination. (m. 02)
 1.
 2.

- vi. Name two agents of pollination aided in cross pollination. (m. 01)
 1. 2.

B) Man is a unisexual animal. Thus, the male and female reproductive systems are located in two separate organisms. Below is a diagram of the female reproductive system.

- i. Name its parts. (m. 1/2 x 4)

A - B -
 C - D -



ii. Name two hormones secreted by the following structures that control changes in the menstrual cycle.

(a) Pituitary gland. (m. 01)

1. 2.

(b) Structure 'A' (m. 01)

1. 2.

iii. The changes occurring in 'C' during the menstrual cycle can be divided into three main phases. Complete the following table about the phases given. (m. 03)

Phase	Change that occurs
Menstrual phase	(a)
(b)	Degraded wall starts to re-build
Secretory phase	(c)

03. A) A group of students put equal masses of magnesium ribbon and magnesium powder into two test tubes and added an equal volume of dilute hydrochloric acid to each of those tubes. The data obtained by measuring the volume of gas released over time were plotted as shown in the graph given below.

i. What reactants were in the tube representing graph A? (m. 01)

.....

ii. Which factor affecting the rate of the chemical reaction was tested by the experiment carried out by the students? (m. 01)

.....

iii. State the physical forms of magnesium in the tubes representing graphs A and B. (m. 01)

A - B -

iv. Write the balanced chemical equation for the chemical reaction taking place in the test-tubes. (m. 02)

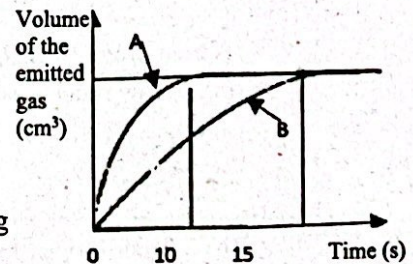
.....

v. How to identify the gas released during the above-mentioned reaction, in the laboratory? (m. 02)

.....

vi. Apart from the factor mentioned above (ii), name two other factors that affect the rate of chemical reaction.

1. 2. (m. 02)



B) A group of students burnt a clean piece of magnesium ribbon in air and observations were recorded.

i. Is Magnesium a metal or non metal? (m. 01)

.....

ii. Write the balanced chemical equation to indicate the chemical reaction taking place above. (m. 02)

.....

iii. Write two observations received, during the above reaction (m. 02)

1.

2.

iv. Write the type of chemical reaction to which the above reaction belongs. (m. 01)

.....

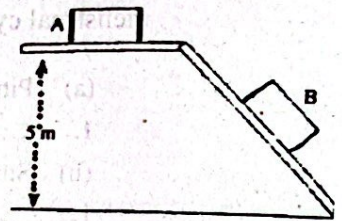
04. A) given is an image of a brick, placed on a surface.

i. When the brick is in the position 'A',

(a) Mark and name the force acting on the brick in the diagram given. (m. 01)

(b) What type of energy does the brick shown in the image have? (m. 01)

(c) Calculate the amount of energy the brick has, if its mass is 2 kg. ($g = 10 \text{ ms}^{-2}$) (m. 02)



ii. Write down the energy transformation that occurs when the brick reaches the position 'B'. (m. 01)

iii. What is the velocity of the brick, when it reaches the base of the inclined plane? (m. 02)

iv. State an assumption you made in the above calculation. (m. 01)

v. A man drags 10 such bricks for a distance of 50 m.

(a) How much work did he do there? (m. 02)

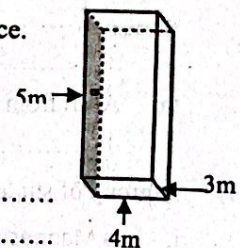
(b) Against what force should the work is done? (m. 01)

(c) If the time taken for that work is 100 seconds, what is the rate at which work is done? (m. 02)

B) The pressure exerted by a solid depends on the surface area it touches on a surface.

i. The figure shows a cubical object whose length, width and height are 4 m, 3 m and 5 m respectively.

(a) What is the maximum pressure this creates on a surface? (m. 02)



- Answer only 3 questions.

05. A) Organisms are made up of one or more cells.

- What is a cell? (m. 01)
- (a) Name the two types of organisms classified according to the organization of nucleus in a cell? (m. 01)
(b) Name a group of organisms with an organized nucleus that cannot be seen with the naked eye. (m. 01)
- Write one function for each of the cell organelle given below. (m. 04)
 - Chloroplasts
 - Mitochondrion
 - Golgi body
 - Rough endoplasmic reticulum
- Chromatin body is present inside the nucleus of a cell. During cell division, the chromatin bodies can be seen as chromosomes.
 - Write two functions of chromosomes. (m. 02)
 - How many pairs of chromosomes are there in a human cell? (m. 01)
- Write two differences between a plant cell and an animal cell. (m. 02)

B) Hemophilia is a genetic disorder that occurs due to a recessive gene linked to 'X' chromosome.

- What is the main symptom of this disease? (m. 01)
- Write the genotype of the women found in the society for following situations related to the disease. (Consider recessive gene for Hemophilia as, 'h' and dominant gene for Hemophilia as, 'H').
 - Healthy woman
 - Carrier woman (m. 02)
- When a carrier female for Hemophilia is married to a healthy male,
 - Illustrate how the disorder is inherited in the first generation (F1) of offsprings. (m. 02)
 - Mention the genotype ratio of their progeny. (m. 01)
 - Mention the phenotype ratio of their progeny. (m. 01)
- State an inherited disorder that is caused by a gene mutation. (m. 01)

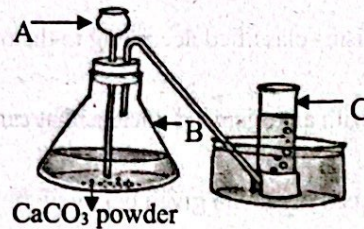
06. A) Following table shows the atomic numbers and mass numbers of some elements. The symbols given are not true symbols of the respective elements.

Element	A	B	C	D	E	F
Atomic number	9	10	11	12	14	9
Mass number	19	20	23	24	28	20

- The element C forms an ion of C^+ .
 - The electronic configuration of C^+ is 2, 8.
 - Answer the questions using the given data and the symbol.
- What are metallic elements from the above? (m. 01)
 - Write the standard symbols of metallic elements identified in (i) above. (m. 02)
 - Write separately the elements that form a monovalent positive ion and a monovalent negative ion.
 - monovalent positive ion
 - monovalent negative ion (m. 02)
 - Which of the above elements has stable electronic configuration? (m. 01)
 - (a) What are isotopes? (m. 01)
(b) Which of the above given elements are isotopes? (m. 01)
 - Which of the above elements can exist as gases at room temperature? (m. 01)

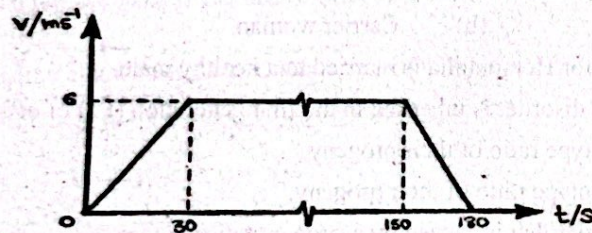
- vii. If a compound is formed between A and C,
 (a) What is the formula of the compound formed? (m.02)
 (b) What type of chemical bonds does it have? (m. 01)

B) Diagram given below shows an experiment done in the laboratory to produce carbon dioxide gas.



- Name the equipment 'A' shown in the setup. (m. 01)
- What is the substance put in equipment 'A'? (m. 01)
- State an observation during the reaction in vessel 'B' (m. 01)
- How does the method of collection of gas, shown in the figure is known as? (m. 01)
- At the end of the experiment, the mass of the gas collected in the container 'C' is 11g.
 - Calculate the relative molecular mass of a molecule of carbon dioxide. (C=12,O=16) (m.02)
 - Calculate the amount of moles of carbon dioxide molecules collected at the end of the experiment? (m. 02)

07. A) The motion of a bicycle due south along a linear horizontal path is shown in the following velocity-time graph.



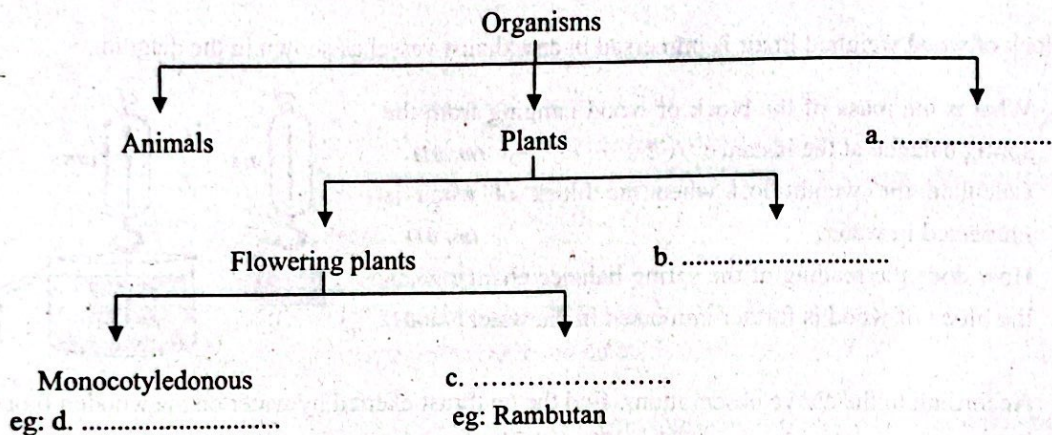
- What is the time interval during which the bicycle traveled at constant velocity? (m. 01)
- For how long has the bicycle been accelerating? (m. 01)
 - What is the acceleration of the bicycle? (m. 02)
 - What is the maximum velocity attained by the cyclist? (m. 01)
- The force exerted by the cyclist in the south direction for the time interval, 30–150s, is 10 N.
 - What is the value of the opposing force acting on the bicycle during this time? (m. 01)
 - What is the direction of that force? (m. 01)
 - How much work did the cyclist do during that time? (m. 02)
- The mass of the bicycle with the cyclist is 60 kg. What was the resultant force acting on the bicycle during the last 30 seconds of motion? (m. 02)

B) An object moving on a surface gradually slows down and eventually comes to rest, due to the frictional force exerted by the surface to prevent the motion of the object.

- Name the frictional forces acting in the following instances.
 - When there is no relative motion between the objects even though a force is applied. (m. 01)
 - When there is a relative motion between objects (m. 01)

- ii. Name two factors that affect the limiting friction exerted by a surface. (m. 02)
- iii. Write an advantage of increasing the friction. (m. 01)
- iv. Mention two methods used to reduce friction. (m. 02)
- v. Write steps of an activity to show that limiting friction does not depend on the surface area of the contact surfaces. (Observation and conclusion are not needed) (m. 02)

08. A) Classification of organisms into groups, is necessary for a successful study about them. An incomplete classification chart of living things is given below.



- i. Write down the appropriate words for a, b, c and d. (m. 02)
- ii. Mention one difference each, in the root system and leaf venation of 'Rambutan' plant and monocotyledonous plant. (m. 02)

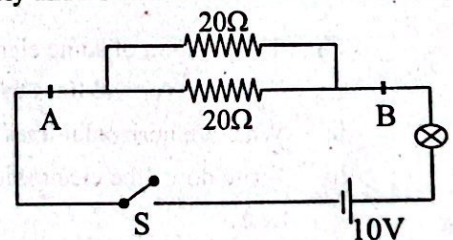
Plant	Root system	Leaf venation
a. Rambutan		
b. Monocotyledonous plant		

- iii. Mention the phyla/group to which animals with the following characteristics belong. (m. 04)
 - (a) Coelomate animals with a body divided into segments externally and internally.
 - (b) Triploblastic, coelomate animals with jointed legs.
 - (c) Animals showing metamorphosis and a three-chambered heart.
 - (d) Homoeothermic animals with external ear lobes and skin covered by hairs.

B) Two resistors of $20\ \Omega$ are connected in parallel, a $10\ \text{V}$ power supply and a switch are connected between its terminals A and B are shown in the figure.

(Assume that the internal resistance of the battery is zero.)

- i. State whether current flows from A to B or B to A? (m. 01)
- ii. What is the current flowing in the circuit when the switch 'S' is closed? (m. 02)



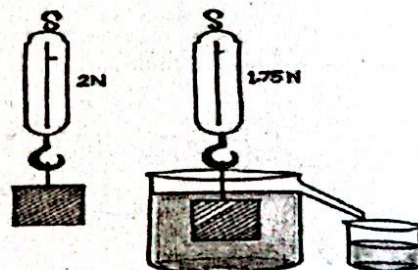
- iii. When one of the resistors is removed and the switch is closed, does the brightness of the bulb decrease or increase as compared to the instance mentioned in above (ii)? (m. 01)
- iv. Draw another method of connection for the two resistors given, in answer sheet. (m. 02)

- v. Draw a circuit diagram to illustrate the way in which a voltmeter is connected to measure the potential difference between A and B and an ammeter is connected to measure the current flowing through the circuit. (m. 02)

- C) Gregor Mendel - a priest - was the first to conduct scientific studies on the inheritance of characteristics.
- What is the name of the plant used for the study? (m. 01)
 - Mention two reasons for choosing the above mentioned plant by the priest. (m. 02)
 - What is known as a monohybrid cross? (m. 01)

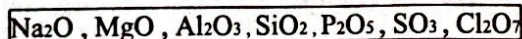
09. A) A block of wood weighed in air is immersed in an exhaust vessel as shown in the diagram.

- What is the mass of the block of wood hanging from the spring balance at the instance 'A'? (m. 01)
- Calculate the weight lost when the block of wood is immersed in water. (m. 01)
- How does the reading of the spring balance change when the block of wood is further immersed in the water? (m.01)



- According to the above observations, find the up thrust exerted by water on the wooden block. (m.2)
- What is the weight of water displaced into the beaker when the wooden block was immersed in it? (The density of water is 1gcm^{-3}) (m. 02)
- Write the scientist who proposed the law used in the above calculations? (m. 01)
- Write down the law used in the above calculations. (m. 02)

- B) The oxides of some elements belong to the third period are shown below.



- Among the above oxides
 - Strongly acidic oxide is? (m. 01)
 - The amphoteric oxide is? (m. 01)
 - The strongly basic oxide is? (m. 01)
- By which of the element in the third period, an oxide is not formed? (m. 01)
- Draw the electronic configuration of an atom of that element mentioned above. (m. 01)

- C) The position of some elements in the periodic table is shown below.

- What are vertical lines of this table called? (m. 01)
- What are horizontal lines of this table called? (m. 01)
- Write down the electronic configuration of the element shown as A. (m. 01)
- In which group noble gases are included? (m. 01)

	I	II	III	IV	V	VI	VII	VIII
(1)	A							
(2)				B			C	D
(3)	E					F		
(4)								