

Part B- Essay

(05) (A) The life process that gives rise to a new generation from an existing generation is referred to as reproduction.

1. Name one plant doing vegetative propagation by following plant parts.
 - i. Roots
 - ii. Runners
 - iii. Rhizome
2. Write two adaptations shown by plants to avoid self pollination and promote cross – pollination.
3.
 - i. Name 2 glands associated with the male reproductive system.
 - ii. Name the follicle stimulating hormone.
 - iii. Write a function of epididymis of male reproductive system.
 - iv. Where does fertilization of ova takes place in the female reproductive system?

(B) Photosynthesis produces food in green plants.

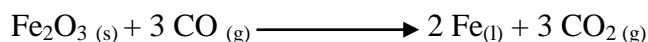
- i. What are the two external factors affect for the photosynthesis process?
- ii. Following are several steps followed in an experiment which is done to show the sunlight is essential for photosynthesis. Complete the steps.
 - a. Pick a plant leaf which is exposed to sunlight.
 - b.
 - c. Warm in alcohol.
 - d.
 - e.
 - f. Obtain a dark purple colour.

(C) 1. The dominant gene for Hemophilia is H and recessive gene is h. When a carrier female is married to a healthy male, how does the inheritance of Hemophilia happen? Show in a genetic diagram.

2. Genes of which plant inserted into the paddy to produce golden rice?
3. Write one common inherited characteristic among human.

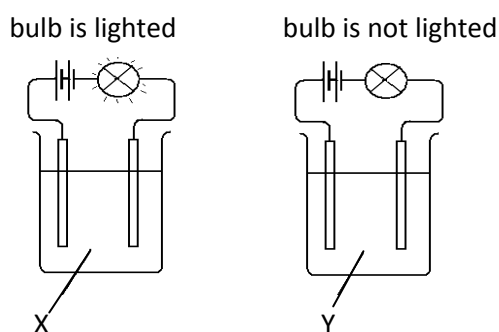
(06) (A) Iron is extracted from the iron ore mined from the soil.

1. What is the instrument used for this process?
2. Following is one of the reactions happens inside it. (Fe = 56, O = 16)



- i. Find the molar mass of Hematite.
- ii. What is the mass of Fe_2O_3 to be reduced to obtain 112 g of Fe?

(B) Given below A and B set ups are prepared in the laboratory to identify types of bonds.



1. Write the types of bonds in X and Y separately.

2. Write 2 compounds used for X and Y separately.
3. Write 2 physical properties in compound X.

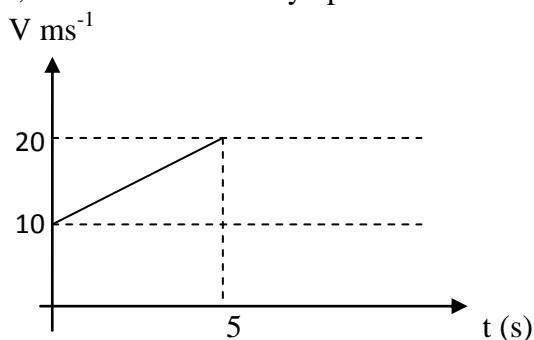
(C) A, B, C, D, E, F, G and H are 8 consecutive elements that belong to second and third periods of the periodic table. B is a noble gas.

1. Which element has the highest electro negativity?
2. Which element has the highest first ionization energy?
3. What is the formula of the compound made by C and A?
4. Which element makes a strong basic oxide?

(D) Salt is extracted by collecting sea water in tanks.

1. What is the salt deposited in the first tank?
2. What is the concentration of mother solution when NaCl deposition takes place?

(07) (A) Following graph shows how an elevator with people moving at a constant velocity of 10 ms^{-1} , increased its velocity up to 20 ms^{-1} within 5 s.

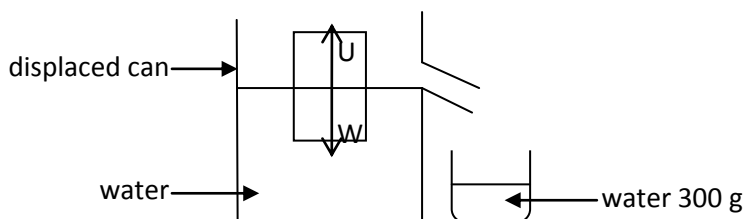


1. Find the acceleration of the elevator.
2. Find the displacement of the elevator during that time.
3. If the mass of the elevator with the people is 500 kg, what is the unbalanced force act on the elevator to move in acceleration? ($g = 10 \text{ ms}^{-2}$)

(B) A space shuttle without people with the mass of 600 kg moved out from the earth's gravity to land on the moon.

1. What is the weight of it at the earth?
2. What is the reason for decreasing the weight of it at the moon?
3. Write down the Newton's law of motion of the rocket when it take off from the earth.

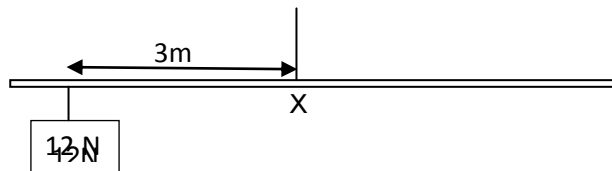
(C)



Above is a set up arranged to demonstrate Archimedes Law. When the block of wood is immersed in the vessel X, 300 g of water got displaced. ($g = 10 \text{ ms}^{-2}$)

1. Write the Archimedes Law.
2. Find the up thrust acts on the block of wood.
3. Find the weight of the block of wood.

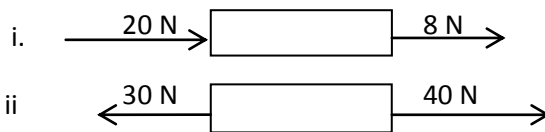
(D)



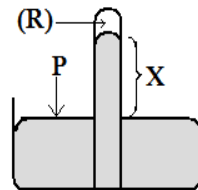
1. Find the anti – clockwise moment of force.
2. Without removing 12 N weight and hanging 6 N weight at the right side it is expected to be balanced. How far the weight should hang from the point X?

(08)(A) When more than one force is applied, the single force that gives the same result as that of all the contributing forces is known as the resultant force.

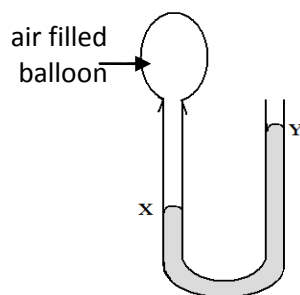
1. Find the resultant force in following instances.



(B) Given below is a set up prepared with a liquid of 1500 kgm^{-3} density.
($P = \text{atmospheric pressure} = 1 \times 10^5 \text{ Nm}^{-2}$, $g = 10 \text{ ms}^{-2}$)



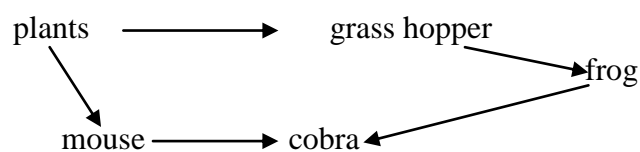
1. Find the height of the liquid column in the above given atmospheric pressure.
2. What has happened to set up when it takes 1 km above the sea level?
3. What is indicated by 'R' in the above set up?
4. Give 2 examples where atmospheric pressure is used.
- 5.



If this set up is exposed to sunlight about an hour what can you observe? Write 2 observations.

(C) All living units show one or few living characteristics.

1. What do you mean by growth?
2. Given below is a food web.



- i. Name two organisms show heterotrophic mode of nutrition.
- ii. What is the energy source used by plants in their mode of nutrition?

- (D) 1. Write one function of each of the following organelles.
- Mitochondria
 - Endoplasmic reticulum
2. Name the chemical compound made of plant cell wall.
3. Name a place where meiosis takes place in a living organism.
4. What the type of division responsible for new characteristics?

(09) (A) If the time taken by ultrasound waves transmitted by a ship which was in an exploration of debris of a ship to reach the detector again after reflection from the sea bottom is 3 s. (speed of sound in sea water is 1400 ms^{-1})

- Find the depth of the sea.
- What is known as the Lithotripsy technology?
- Write 2 common characteristics of electro-magnetic waves.
- Write down the type of electro-magnetic waves used in following instances.
 - To check hidden symbols in currency notes.
 - To take photographs of internal organs of the human body.
- Write down the optical device used in following instances.
 - To diverge a parallel light beam.
 - To prepare a solar hearth.

(B) You are provided with following metals and answer using them only.

Na, Mg, Cu, Zn, Fe, Pb

- Which metal is stored in paraffin oil?
- Name 2 metals which can displace Cu from CuSO_4 solution.
- Write 2 uses of Magnesium metal.
- Name the metal which is not reacted with dilute acids.
- Write observations when a small piece of Sodium is put into the water.
- Write the method of extracting Sodium and Magnesium.