RAVI MATHS TUITION CENTER, CHENNAI - 82. WHATSAPP - 8056206308

10TH CBSE SCIENCE MODEL PAPER 1

10th Standard CBSE

Science

Exam Time : 03:00:00 Hrs

Total Marks : 80

1) 1

Which of the statements about the reaction below are incorrect?

$2PbO(s) + C(s) \rightarrow 2Pb(s) + CO_2(s)$

(a) Lead is getting reduced

(b) Carbon dioxide is getting oxidized

(c) Carbon is getting oxidized

(d) Lead oxide is getting reduced.

(a) (a) and (b) (b) (a) and (c) (c) (a), (b) and (c) (d) All of these

2) 1

Which of the following is not a physical change?

(a) Boiling of water to give water vapour. (b) Melting of ice to give water.

(c) Dissolution of salt in water.

(d) Combustion of Liquefied Petroleum Gas(LPG).

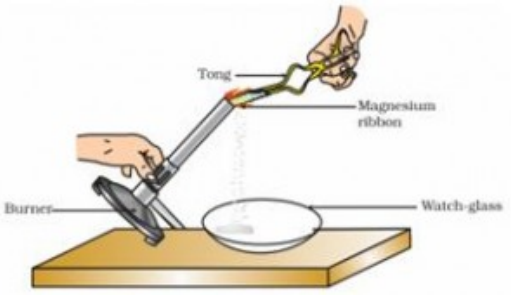
3) 1

Chemically rust is

(a) only ferric oxide (b) hydrated ferrous oxide **(c) hydrated ferric oxide**

(d) none of these

4) 1



A magnesium ribbon is burnt in air. A student made the following observations

i. Magnesium ribbon undergoes oxidation reaction.

ii. Magnesium reacts with air to form magnesium oxide.

iii. Magnesium ribbon undergoes decomposition reaction.

(a) (ii) and (iii) (b) (i) and (iii) (c) (i), (ii) and (iii) **(d) (i) and (ii)**

5) 1

Freezing of water is a

(a) Physical change (b) Chemical change

(c) Both physical and chemical change (d) Exothermic reaction

6) Which one of the following will turn blue litmus red? 1

(a) Vinegar (b) Lime water (c) Baking soda solution

(d) Washing soda solution

7) Soda-acid fire extinguishes the fire by 1

(a) cutting the supply of air (b) raising ignition temperature

(c) removing combustible substance (d) none of these

8) Food cans are coated with tin and not with zinc because 1

(a) Zinc is costlier than tin (b) Zinc has a higher melting point than tin

(c) Zinc is more reactive than tin (d) Zinc is less reactive than tin

9) The process of coating of Zn over Fe is known as 1

(a) Cathodic protection (b) Metallurgy (c) Tinning **(d) Galvanization**

10) Mineral acids are stronger acids than carboxylic acids because 1

i) mineral acids are completely ionized

ii) carboxylic acids are completely ionized

iii) mineral acids are partially ionized

iv) carboxylic acids are partially ionised

(a) (i) and (iv) (b) (ii) and (iii) (c) (i) and (ii) (d) (iii) and (iv)

11) Drinking alcohol and driving may cause serious accidents. To discourage this, police randomly test drivers for alcohol using a breath analyser. The breath analyser works because 1

(a) Alcohol makes the breath dry and the machine registers moisture

(b) Alcohol makes the breath hotter which changes the machine reading

(c) Alcohol causes more saliva which the machine checks.

(d) Alcohol in the breath cause a chemical change registered by the machine

12) According to IUPAC system, the correct name of the organic compound is 1

$$CH3 - \overset{Br}{\overset{|}{C}}H - CH2 - \overset{O}{\overset{||}{C}} - OH$$

(a) 2-bromobutanoic acid (b) 2-bromobutysis acid

(c) 3-bromobutanoic acid (d) 3-bromo-2-hydroxybutan-2-one

13) Which of the following is the plant hormone? 1

(a) Insulin (b) Thyroxin (c) Oestrogen **(d) Cytokinin**

14) The image formed by a concave mirror is observed to be virtual, erect and larger than the object.Where should be the position of the object? 1

(a) Between the principal focus and the centre of curvature

(b) At the centre of curvature (c) Beyond the centre of curvature

(d) Between the pole of the mirror and its principal focus.

15) Which of the following terms does not represent electrical power in a circuit? 1

(a) I^2R **(b) IR^2** (c) VI (d) V^2/R

16) The device used for producing electric current is called a 1

(a) generator (b) galvanometer (c) ammeter (d) motor

17) 1

Assertion: The chemical equation is always balanced.

Reason: The total mass of elements before reaction should be equal to the total mass of elements after reaction.

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.

(b) If both assertion and reason are true but reason is not a correct explanation of assertion.

(c) If assertion is true and reason is false.

(d) If both assertion and reason are false.

Answer : (a) If both assertion and reason are true and the reason is correct explanation of assertion.

18) 1

Assertion: Limestone, chalk and marble are different forms of calcium carbonate

Reason: It reacts with acids to give a carbonate salt, carbon dioxide and water.

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.

(b) If both assertion and reason are true but reason is not a correct explanation of assertion.

(c) If assertion is true and reason is false.
(d) If both assertion and reason are false

Answer : (c) If assertion is true and reason is false.

19) a) 1

Electrolysis of water is a decomposition reaction. The mole ratio of hydrogen and oxygen gases liberated during electrolysis of water is

(a) 1 : 1 **(b) 2 : 1** (c) 4 : 1 (d) 1 : 2

(OR)

b) 1

An aqueous solution turns red litmus solution blue. Excess addition of which of the following solution would reverse the change?

(a) Baking powder (b) Lime (c) Ammonium hydroxide solution

(d) Hydrochloric acid

20) a) 1

Metals are refined by using different methods. Which of the following metals are refined by electrolytic refining?

(i) Au (ii) Cu (iii) Na (iv) K

(a) (i) and (ii) (b) (i) and (iii) (c) (ii) and (iii) (d) (iii) and (iv)

(OR)

b) 1

Generally, non-metals are not conductors of electricity. Which of the following is a good conductor of electricity?

(a) Diamond **(b) Graphite** (c) Sulphur (d) Fullerene

21) a) 2

Why should a magnesium ribbon be cleaned before burning in air?

Answer : Magnesium is very reactive metal. When stored it reacts with oxygen to form a layer magnesium oxide on its surface. This layer of magnesium oxide is quite stable and prevents further reaction of magnesium with oxygen. The magnesium ribbon is cleaned by sand paper to remove this layer so that the underlying metal can be exposed into air.

(OR)

b) 2

Explain the formation of scum when hard water is treated with soap.

Answer : Hard water often contains salts of calcium and magnesium. Soap molecules react with the salts of calcium and magnesium and form a precipitate. This precipitate begins floating as an off-white layer over water. This layer is called scum. soaps lose their cleansing property in hard water because of formation of scum.

22) Why should curd and sour substances not be kept in brass and copper vessels? 2

Answer : Curd and other sour substances are acidic in nature due to the presence of acid in them. So when curd and other sour substances when kept in brass and copper vessels, they react with brass and copper to form toxic compounds which makes the food unfit for consumption.

23) Why are the small numbers of surviving tigers a cause of worry from the point of view of genetics? 2

Answer : The small number of tigers are causing a worry for the genetics because if they become extinct then the genes of this species will be lost forever. There will be no scope of again getting this species back to life without their genes.

24) Find the focal length of a lens of power - 2.0 D. What type of lens is this? 2

Answer : Power of Lens

$P = \frac{1}{f}$

$f = \frac{1}{D}$

$f = \frac{1}{-2} = -0.5m.$

A concave lens has a negative focal length. Hence, it is a concave lens.

25) a) In the Modern Periodic Table, which are the metals among the first ten elements? 2

Answer : Lithium, Beryllium, Boron are the metals in Modern Periodic Table among the first ten elements.

(OR)

b) What are the necessary conditions for autotrophic nutrition and what are its byproducts? 2

Answer : Conditions necessary for autotrophic nutrition are sunlight, carbon dioxide and chlorophyll. The byproduct formed is molecular oxygen.

26) a) Which metals do not corrode easily? 2

Answer : Metals which lie at the bottom in the activity series of metals do not corrode easily i.e., Gold and platinum.

(OR)

b) How is the process of pollination different from fertilisation? 2

Answer : Transfer of pollen grains from anther to stigma is called pollution. On the other hand, fusion of male and female gametes is called fertilisation. Pollination is a physical process in which movement of pollen grains are attained by certain physical factors. Fertilization is a biological process. Ovary is the site of fertilization and embryo is the product of fertilization.

27) a) 3

Write the balanced equation for the following chemical reactions.

(i) Hydrogen + Chlorine → Hydrogen chloride

(ii) Barium chloride + Aluminium sulphate → Barium sulphate + Aluminium chloride

(iii) Sodium + Water → Sodium hydroxide + Hydrogen

Answer : (i) $H_2(g) + Cl_2(g) \rightarrow 2HCl_3$

(ii) $3BaCl_2 + Al_2(SO_4)_3 \rightarrow 3BaSO_4 + 2AlCl_3$

(iii) $2Na(s) + 2H_2O(aq) \rightarrow 2NaOH(aq) + H_2(g)$

(OR)

b) 3

How could the Modern Periodic Table remove various anomalies of Mendeleev's Periodic Table?

Answer : (a) The positions of certain elements were justified.

(b) The position of isotopes has been justified.

(c) The prediction of properties of elements.

28) 3

Differentiate between metal and non-metal on the basis of their chemical properties.

Answer :

NO.	PROPERTIES	METALS	NON-METALS
1.	Nature of ions	Metals are electropositive elements	Non-metals are electronegative elements
2.	Nature of oxides	Metals from basic oxides.	Non-metals from acidic or neutral oxides.
3.	Reaction with water	Metals displace hydrogen from water or steam.	Non-metals do not displace hydrogen from water or steam.
4.	Reaction with dilute acids	Metals above hydrogen in the reactivity series displace hydrogen from dilute acids.	Non-metals do not displace hydrogen from dilute acids and hence do not react with dilute acids.
5.	Nature of chlorides	Metals form solid ionic chlorides	Non-metals form covalent chlorides.
6.	Nature of hydrides	Metals form ionic hydrides	Non-metals form covalent hydrides
7.	Oxidising and reducing nature	Metals behave as reducing agents	Non-,metals behave as oxidising agents.

29) How do Mendel's experiments show that traits are inherited independently? 3

Answer : When Mendel crossed pure breed tall pea plants with pure breed short pea plants, he found that only tall plants were produced in F_1 generation. Mendel, further crossed . the tall pea plants obtained in F_1 generation with dwarf plants and obtained the ratio of Tall: Short plant as 3 : 1 in F_2 generation. This experiment proved that traits are inherited independently so other intermediate traits or new traits were formed.

30) An electric oven of 2kW is operated in a domestic electric circuit (220 v) that has a current rating of 5 A. What results do you expect ? Explain. 3

Answer : From,
P = VI
I = P / V
P = 2 kW = 2000 W,
V = 220 V,
Substituting the value, we get
I = 2000 W / 220 V = 9.09 A
Here, the oven is drawing 9.09 ampere of current from a 5 ampere source.
Result : This means there would be an overload on the circuit. This can result in accidental fire in the circuit.

31) What are three basic cause that has brought criticisms about large dams projects? 3

Answer : (i) Social problem-as its construction displaces large number of tribals and local peasants without proper compensation and rehabilitation.
(ii) Economic problem-such projects need lot of money for the setup or construction without much of output or benefit.
(iii) Environmental problem-the construction causes deforestration and loss of biological diversity

32) a) What are the qualities of an ideal source of energy? 3

Answer : a) It should be able to do large amount of work for each unit of mass or volume.
b) It should be easily accessible.
c) It should be easily transported.
d) It should be economical.

(OR)

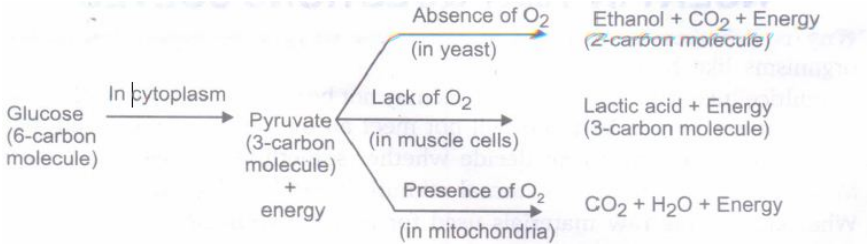
b) State the principle of working of ocean thermal energy conversion plant. Explain how the plant works? Write one essential condition for it to operate properly. 3

Answer : Principle of working of OTEC: The water at the surface of the ocean is warmer than the water at deeper depths. This temperature difference can be used by Ocean Thermal Energy Conversion (OTEC) systems to generate electricity.
OTEC-It is Ocean Thermal Energy Conversion. These plants can operate if the temperature difference between water at the surface and water at depths up to 2 km is 293 K (20°C) or more. The warm surface water is used to boil a volatile liquid like ammonia. The vapour of the liquid is then used to run the turbine. The cold water from the depth is pumped up and condense vapour again to liquid.

33) a) 3

What are the different ways in which glucose is oxidised to provide energy in various organisms?

Answer : Breakdown of glucose by various pathways for different organisms are:



(OR)

b) 3

How does binary fission differ from multiple fission?

Answer :

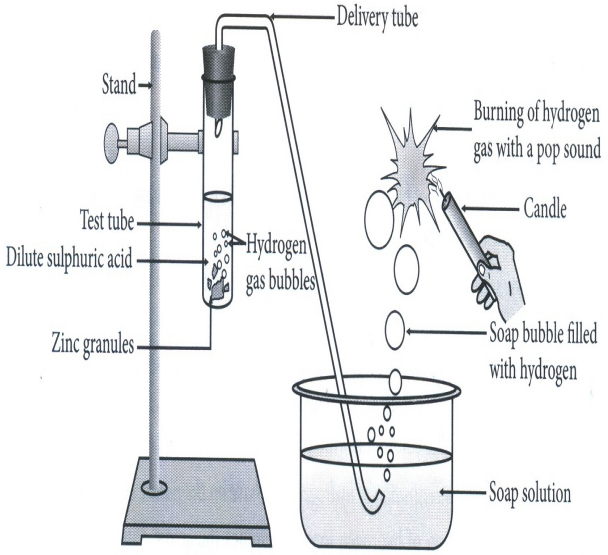
	Binary Fission	**Multiple Fission**
(a)	Two daughter cells are formed	Multiple daughter cells are formed
(b)	Happens during favourable conditions	Happens during unfavourable conditions.
(c)	It is a routine process	It is utilized to tide over the unfavourable conditions.

34) a) 4

Which gas is usually liberated when an acid reacts with a metal? Illustrate with an example, How will you test for the presence of the gas?

Answer : When acid reacts with metal, it liberates hydrogen gas usually. The following method can be used for testing the hydrogen gas:
Take some zinc granules in the test tube and pour sulphuric acid in it. Allow the gas pass through the solution of soap. When gas starts coming out from the soap solution bubbles are formed. Bring a burning candle near the bubbles of gas. It burns with a pop sound. Burning of gas with pop sound proves that it is hydrogen gas. Reaction involved in this process is as follows:

$Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2 \uparrow$



(OR)

b) Draw the electron dot structures for **4**

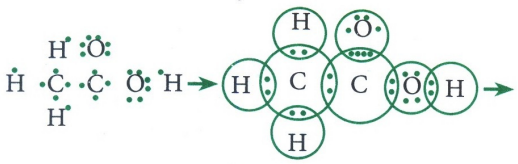
(a) Ethanoic acid

(b) H_2S

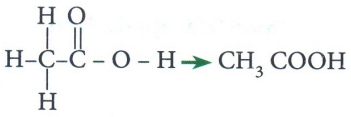
(c) Propanone

(d) F_2

(a) Ethanoic Acid



Answer :

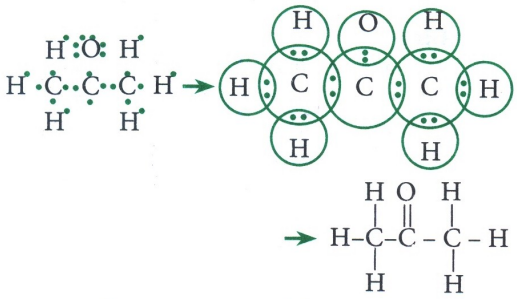


Bond Formation in CH_3Cl

(b) H_2S

Dot structure of H_2S

(c) Propanone



Dot structure of Propanone

(d) F_2

Dot structure of F_2

35) a) **4**

How does a solenoid behave like a magnet? Can you determine the north and South poles of a current-carrying solenoid with the help of a bar magnet? Explain.

Answer : A solenoid behaves like a magnet when electric current flows through it. Any current carrying conductor creates a magnetic field around it. For determining the different poles of a solenoid, we can use a bar magnet and look for interaction between different poles of a solenoid, we can use a bar magnet and look for interaction between different poles of two magnets. If the north pole of the bar magnet gets repulsed by a particular pole of the electromagnet (solenoid) then it gets confirmed that the bar by a particular pole of the electromagnet (solenoid) then it gets confirmed that the bar magnet was brought near the north pole of the electromagnet.

(OR)

b) **4**

"Damage to the ozone layer is a cause of concern". Justify this statement and suggest any two steps to limit this damage.

Answer : Ozone is a molecule of oxygen with 3 atoms i.e., 03. It is formed due to sunlight at higher levels with higher wave length.

$O_2 \xrightarrow[rays]{UV} (O) + (O)$

$O_2 \longrightarrow (O) \longrightarrow O_3$

Ozone is found in stratosphere shielding the earth by protecting it and by not allowing UV rays to reach the earth. If these rays will reach the earth, then many harmful diseases are caused like skin cancer, cataract. It also affects the growth of plants and vegetation. Two steps to limit the damage of this layer are:

(i) Do not use aerosols or any products which will release CFC (chlorofluorocarbon) in the atmosphere.

(ii) Ban on use of CFC as refrigerant and in fire extinguishers.

36) a) 4

(a)What are the differences between aerobic and anaerovbic respiration?

(b)Name some organisms that use the anaerobic mode of respiration.

Answer : (a)

S.No	**Aerobic Respiration**	**Anaerobic Respiration**
1.	Oxygen is utilised for the breakdown of respiratory substrate	Oxygen is not required
2.	It takes place in cytoplasm (glycolysis) and inside	It takes place in cytoplasm only.
3	More energy is released	Less energy is released
4	End products are carbon dioxide and water	End products are lactic acid or ethanol and carbon dioxide.

(b)Yeast and bacteria use anaerobic mode of respiration.

(OR)

b) 4

(a) Define optical centre of a spherical lens.

(b) A divergent lens has a focal length of 20 cm At what distance should an object of height 4 cm from the optical centre of the lens be placed so that its image is formed 10 cm away from the lens. Find the size of the image also.

(c) Draw a ray diagram to show the formation of image in above situation.

Answer : (a) Optical centre of the lens. It is a point within the lens that lies on the principal axis through which away of light passes undeflected.

= f=-20cm h_1 = 4 cm

v = -10 cm u=?

h_2=?

$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

$\Rightarrow \frac{1}{-20} - \frac{1}{10} - \frac{1}{u}$

$\Rightarrow \frac{1}{u} = \frac{1}{10} + \frac{1}{20}$

$\Rightarrow \frac{1}{u} - \frac{1}{10} + \frac{1}{20}$

$\Rightarrow \frac{1}{u} = \frac{-2+1}{20}$

$\Rightarrow \frac{1}{u} = \frac{-1}{20}$

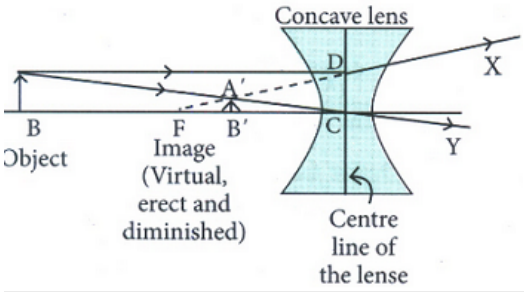
Now,

$\frac{h_2}{h_1} = \frac{v}{u}$

$\Rightarrow \frac{h_2}{4} = \frac{-10}{-20}$

$\Rightarrow h_2 = \frac{10}{20} \times 4 = 2cm$

h_2=2cm



37) 5

Chemical equation is a method of representing a chemical reaction with the help of symbols and formulae of the substances involved in it. In a chemical equation, the substances which combine or react are called reactants and new substances produced are called products. A chemical equation is a short hand method of representing a chemical reaction. A balanced chemical equation has equal number of atoms of different elements in the reactants and products side. An unbalanced chemical equation has unequal number of atoms of one or more elements in reactants and products. Formulae of elements and compounds are not changed to balance an equation.

(i) Consider the following reaction:

$pMg_3N_2 + qH_2O \rightarrow rMg(OH)_2 + sNH_3$

When the equation is balanced, the coefficients p, q, r, s respectively are

(a) 1,3,3,2 **(b) 1,6,3,2**

(c) 1,2,3,2 **(d) 2,3,6, 2**

(ii) Which of the following information is not conveyed by a balanced chemical equation?

(a) Physical states of reactants and products

(b) Symbols and formulae of all the substances involved in a particular reaction

(c) Number of atoms/molecules of the reactants and products formed

(d) Whether a particular reaction is actually feasible or not

(iii) The balancing of chemical equations is in accordance with

(a) law of combining volumes

(b) law of constant proportions

(c) law of conservation of mass

(d) both (b) and (c)

(iv) Which of the following chemical equations is an unbalanced one?

$(a) 2NaHCO_3 \longrightarrow Na_2CO_3 + H_2O + CO_2$

$(b) 2C_4H_{10} + 12O_2 \longrightarrow 8CO_2 + 10H_2O$

$(c)\ 2Al + 6H_2O \longrightarrow 2Al(OH)_3 + 3H_2$

$(d)\ 4NH_3 + 5O_2 \longrightarrow 4NO + 6H_2O$

(v) Which of the following statements is/are correct?

(a) A chemical equation tells us about the substances involved in a reaction.

(b) A chemical equation informs us about the symbols and formulae of the substances involved in a reaction.

(c) A chemical equation tells us about the atoms or molecules of the reactants and products involved in a reaction.

(d) All the above

Answer : $(i)(b) : Mg_3\ N_2 + 6H_2O \longrightarrow 3Mg(OH)_2 + 2NH_3$

(ii) (d)

(iii) (c): In a balanced chemical equation, total mass of reactants must be equal to the total mass of products. This is the statement of law of conservation of mass.

(iv) (b)

(v) (d)

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38) **5**

Ionic compound is a chemical compound in which ions are held together by ionic bonds. An ionic bond is the type of chemical bond in which two oppositely charged ions are held through electrostatic forces. We know that, metal atoms have loosely bound valence electrons in their valence shell and non-metal atoms need electrons in their valence shell to attain noble gas configuration. The metal atom loses the valence electrons while non-metal atom accepts these electrons. By losing electrons, metal atoms change to cations and by accepting electrons, non-metals form anions. Ionic compounds are generally solid and exist in the form of crystal. They have high melting and boiling points.

(i) Which of the following can change to a cation?

(a) Fluorine (b) Oxygen (c) Potassium (d) Neon

(ii) Which of the following can change to an anion?

(a) Iodine (b) Magnesium (c) Calcium (d) Xenon

(iii) Ionic compounds are soluble in _____.

(a) Kerosene (b) Petrol (c) Water (d) None of these

(iv) Which of the following statements is correct about ionic compounds?
I. They conduct electricity in solid state.
II. They conduct electricity in solutions.
III. They conduct electricity in molten state.
(a) I only (b) II only (c) III only (d) II and III only
(v) Select the incorrect statement.
(a) Ionic compounds are generally brittle
(b) Ions are the fundamental units of ionic compounds
(c) Formation of ionic bonds involve sharing of electrons
(d) NaCl is an ionic compound.

Answer : (i) **(c):** Potassium, being a metal, can change to cation by losing its valence electron.
(ii) **(a):** Iodine, being a non-metal, can change to anion by gaining electron.
(iii) **(c):** Ionic compounds are generally soluble in water and insoluble in kerosene and petrol.
(iv) **(d):** Ionic compounds do not conduct electricity in solid state as ions are very closely packed and are free to move.
(v) **(c):** Formation of ionic bonds involve complete transfer of electrons from metal atom to non-metal atom.

39) **5**

Horticultural methods of vegetative propagation multiply desired varieties of plants quickly from parts of their somatic body. A horticulturist used stem cutting of plant X to propagate it in a short span of time. For plant Y, he pulled a branch of towards ground and covered it with soil leaving the tip of branch exposed. He later on cut the branch from parent plant. The former developed into new plant. He propagated plant Z through underground stems called tubers. Identify the propagation methods used by horticulturist and answer the following questions.
(i) What could be plants X, Y and Z?

	X	Y	Z
(a)	**Bougainvillea**	**Jasmine**	**Potato**
(b)	**Sugarcane**	**Ginger**	**Rose**
(c)	**Begonia**	**Banana**	**Chrysanthemum**
(d)	**Guava**	**Onion**	**Cactus**

(ii) Select the propagation methods in plants X, Y and Z.
(a) X - root tubers, Y - stem cutting, Z - stem tubers
(b) X - stem cutting, Y - layering, Z - underground stem
(c) X -layering, Y - underground stem, Z - underground roots
(d) X - grafting, Y - layering, Z - root tubers
(iii) Select the correct statement for plant Z if it is potato.
(a) Each tuber has many buds called ears
(b) It is necessary to plant the whole potato tuber in the soil to produce

new potato plants

(c) Vegetative propagation of potato plants by tubers is much faster than production of potatoes by seeds

(d) All of these.

(iv) Select the plant which propagates by the same method adopted by gardener for plant Y, but naturally it propagates by stolons

(a) Strawberry **(b) Adiantum**

(c) Tulsi **(d) Both (a) and (b)**

(v) Identify the given vegetative propagule.

(a) Bulb **(b) Runner**

(c) Rhizome **(d) Bulbil**

Answer : (i) (a)

(ii) (b)

(iii) (c)

(iv) (a): Many plants like strawberry and raspberry are propagated by the natural layering methods because these plants have runners (soft horizontal stem running above the ground). Whereas the ends of such runners touch the ground new plants are formed.

(v) (d)