MP Board Class 10 General Science 2016 Question Paper with Solutions

1. Fill in the blanks **1 x 5 =5**

(i) Chemical equilibrium is possible only in _____vessel.

Answer: closed

(ii) The focal length of _____ mirror is infinity.

Answer: plane

(iii) Distilled water is a _____ of electricity.

Answer: poor conductor

(iv) Fermentation reaction occurs in the presence of _____

Answer: anaerobic conditions

2. Choose the correct alternative **1 x 5 =5**

(i) The excretory organs of earthworms.

a. Liver
b. Nephridia
c. Lungs
d. Skin

Answer: (b) Nephridia

(ii) The metal which is stored in kerosene oil is

a. Iron
b. Copper
c. Sodium
d. Calcium

Answer: (c) Sodium

(iii) Saptarishi is

a. a comet

b. a constellation
c. a planet
d. a galaxy

Answer: (b) a constellation

(iv) The number of chromosomes found in a human cell is_____

a. 23 pairs
b. 24 pairs
c. 20 pairs
d. 22 pairs

Answer: (a) 23 pairs

(v) The planet nearest to the sun is

a. Jupiter
b. Mercury
c. Saturn
d. Mars

Answer: (b) Mercury

3. Match the columns **1 x 5=5**

A	B
(i) Halley	**a. Iron**
(ii) Bakelite	**b. Methane**
(iii) Producer	**(c) Star**
(iv) Haematite	**(d) Green plants**
(v) Bio-gas	**(e) Synthetic plastic**
	(f) A comet

Answer:

A	B
(i) Halley	(f) A comet
(ii) Bakelite	(e) Synthetic plastic
(iii) Producer	(d) Green plants
(iv) Haematite	a. Iron

(v) Bio-gas	b. Methane

4. Write the answer in one sentence each: **1 x 5 =5**

(i) Give the name of the discoverer of blood groups.

Answer: Karl Landsteiner discovered the ABO blood group system

(ii) In which is the purity of gold expressed?

Answer: Purity of gold is expressed in carats. That is, 24 carats is equal to pure gold.

(iii) What type of electric current flows in a domestic circuit?

Answer: When the path from one terminal of the electric cell to the other is finished, an electric current begins to flow through the circuit, thus lighting up the bulbs. The electric current flows from the positive terminal to the negative terminal of the electric cell.

(iv) What is the name of the respiratory organ of fish?

Answer: The respiratory organ of the fish is known as gills, which contains a huge amount of capillaries and here the exchange of oxygen from the water and carbon dioxide from the blood happens.

(v) Which properties of plants are described in " Rig Veda"?

Answer: The medicinal and healing properties of the plants are described in "Rig Veda."

5. What is the difference between real and imaginary virtual images?

Answer: Find here the difference between real and virtual image.

Or

What are the primary colours of pigments?

Answer: The primary colours of light are usually red, green and blue. However, the primary colours of pigment are not about adding colours, but rather it is about subtracting colours. So, imagine taking the red away to reveal a cyan colour, and likewise green giving way to magenta (purple) and revealing yellow by taking the blue away. So, the primary colours of pigments would be cyan, magenta (purple) and yellow.

6. What is potential? Write its S.I. unit.

Answer: An electric potential also known as the electrostatic potential is the amount of work that is required to move a unit positive charge from a reference point to a specific point inside the field without producing any acceleration. The S.I. The unit is Volt.

Or

Write Ohm's Law.

Answer: Ohm's law states the relationship between electric current and potential difference. Ohm's law states that the voltage across a conductor is directly proportional to the current flowing through it, provided all physical conditions and temperature remain constant. Mathematically, this current-voltage relationship can be written as V= IR.

7. What is denatured alcohol?

Answer: Alcohols that are used for drinking are made unfit for human consumption by mixing alcohol with some copper sulfate and pyridine, which gives the colour and a foul smell to the liquid, respectively. This is called denatured alcohol.

Or
Write the name of two enzymes used in alcohol preparation from molasses.
Answer: A non-crystalline form of sugar, Molasses is obtained as the mother liquor following the crystallisation of sugar from the sugar solution. This consists of nearly 50% sugar. This mother liquor is diluted to about 10% solution, and then yeast is added and kept for about 2-3 days. Yeast supplies the enzymes invertase and zymase. The enzyme invertase hydrolyses sucrose to glucose and fructose. The enzyme zymase (found in yeast) converts glucose and fructose to ethanol. Hence, the two enzymes used in alcohol preparation are invertase and zymase.
8. Differentiate between stars and planets.
Answer: Find here the difference between stars and planet.
Or
Write the characteristics of terrestrial planets.
Answer: Terrestrial planets are known to be rocky because they are formed close to the parent star where it is too warm for the gases to condense to the solid planets. Also, these planets are small and lower gravity is not able to hold on to the escaping gases.
9. What is hypermetropia? Give its reasons. Explain with the help of labelled ray diagram how it is corrected.
Answer: Answer: People with hyperopia or hypermetropia are said to have far-sightedness or long-sightedness. Cause and treatment for hypermetropia are given here.
Or
What is the difference between a compound microscope and telescope?
Answer: Microscopes are used to magnify small objects that are short distance (closer to the lens), whereas telescopes are used to magnify large objects at more distance from the viewer. While the telescopes use natural light at the focal point, while the microscope uses artificial light.
10. What are the factors responsible for the resistance of a conductor?
Answer: Find here the factors on which the resistance of a conductor depends.
Or

What precautions do you take while using electricity?

Answer: Here are some precautions to take while using electricity:

1. Keep electric switches and sockets away from small children, fitting them at a height where they cannot reach and put pins or nails inside. Do not pull the plug wires while removing a plug from its socket.
2. Switch off the electrical appliance before cleaning it and also remove its plug from the socket.
3. Do not handle electrical appliances with wet hands and remember to use footwear with rubber soles. Rubber is an insulator, and it can help to prevent the current from flowing through our body, thereby protecting it.
4. Finally, avoid touching the person with electric shock. Put off the main switch, and in case the switch is too far, or you have no idea where it is located, then remove the plug from the socket, if possible. If you are not able to, then use a wooden pole and push the person away from the electric wire.

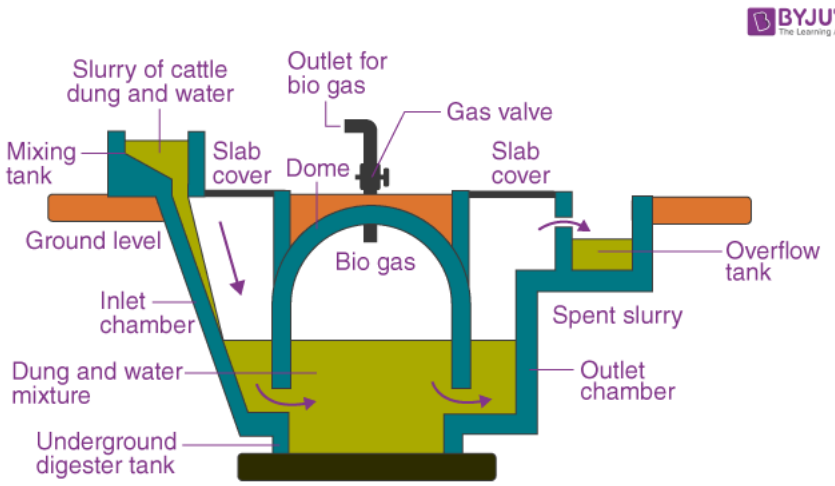
11. Differentiate between nuclear fission and nuclear fusion.

Answer: Find here the difference between nuclear fusion and nuclear fission.

Or

Describe fixed dome type biogas plant with a diagram.

Answer:



12. Describe the reproduction in Amoeba by binary fission method with diagram

Answer: Binary fission is a form of asexual reproduction in which an organism divides into two, each part carrying one copy of genetic material. Meanwhile, Amoeba reproduces asexually through binary fission. In this process, an individual divides itself into two daughter cells. These are genetically identical to each other. Amoeba is a unicellular organism, and just like bacteria, it reproduces through binary fission. After replicating its genetic material through mitotic division, the cell divides into two equal-sized daughter cells. In this method, two similar individuals are produced from a single parent cell. An amoeba that is about to undergo division grows larger, and eventually, its nucleus extends and divides into two. The division of cytoplasm follows the division of the nucleus. So, two amoebae are produced from a single parent, and the parent's identity is technically "lost."

Or

Why did Mendel select the pea plant for his experiment? Write any four reasons.

Answer: Mendel selected pea plants for his experiments due to the following reasons:

- Pea plant is annual; therefore, it was possible to study many generations in a short duration.
- It was easy to get a pure line of homozygous plants by self-pollination because of bisexual flowers.
- Artificial cross-pollination can be easily done by emasculation technique.
- Various contrasting characters are present in pea plants.

13. Explain a quick vinegar method with a diagram.

Answer: Vinegar is a liquid that contains nearly 5–20% acetic acid (CH_3COOH), water, and other trace chemicals such as flavourings. Commercial vinegar is produced via a fast or a slow fermentation process. Quick vinegar method takes place when there is a lack or low level of alcohol. It occurs more frequently in submerged fermentation than in the trickle processes. The three methods used for the production of vinegar are the Orleans Method (also known as the slow method), the Trickling (or quick) Method and Submerged Fermentation.

Or

What is the silver mirror test? Explain the chemical equation.

Answer: Tollens Test is a very useful method to distinguish between aldehydes and ketones. This qualitative lab test is also referred to as the silver mirror test.

14. What do you mean by pH value? Give its importance.

Answer: pH is defined as the negative logarithm of H+ ion concentration. Hence, the meaning of the name pH is justified as the power of hydrogen.

Or

Write the chemical name, chemical formula, preparation method and two uses of plaster of Paris.

Answer: Plaster of Paris is also referred to as Gypsum plaster. The chemical formula of plaster of Paris is written as $CaSO_4 \cdot H_2O$ or $2CaSO_4 \cdot H_2O$. Find here the uses of plaster of Paris.

15. Write the difference between aerobic and anaerobic respiration.

Answer: The difference between the aerobic and anaerobic respiration is given here.

Or

Explain the method of ingestion of food in Nepenthes (pitcher plant) with the help of a diagram.

Answer: Insectivorous means insect-eating; these plants derive most of their nutrition from the insects, that they trap and consume. These are also known as carnivorous plants. Nepenthes is also known as pitcher plant. This is found generally in Asia, Sri Lanka, and Australia. Nepenthes captures prey with specialised leaves known as pitfall traps. It has a slippery surface due to which the insect slips down and gets digested. This plant consists of the pitcher which produces a liquid on its own. The odour of the plant attracts the insects. Once the insect is trapped and produces movement in the plant, the plant starts secreting the digestive liquid. The organism is digested, and the nutrients are absorbed.

16. Describe the functions of blood.

Answer: Find here details about the functions of blood.

Or

Explain the mechanism of reflex action with labelled diagrams.

Answer: Reflex action or reflex is an involuntary action in response to a stimulus. This is a spontaneous action without thinking. For example, we adjust our eyes when exposed to bright light. The peripheral nervous system (PNS) is a system of nerves which connect the central nervous system (CNS) (includes the brain and spinal cord) with other parts of the body. Reflex action is the result of the coordination of the spinal cord and peripheral nervous system. This action does not involve the brain. The pathway in which impulses travel during the reflex action is called a reflex arc.

17. (a) Explain magnetic method separation of ore.
(b) Explain the Froth floatation process.

Answer: (a) Magnetic method of separation involves the use of magnetic properties of either the ore or the gangue to separate them. The ore is first ground to fine pieces and then passed on a conveyor belt passing over a magnetic roller. The magnetic ore remains on the belt, and the gangue falls off the belt. When one substance in the mixture has some magnetic properties, then this method is quite useful. Strong magnets are commonly used to separate magnetic elements.

(b) Froth Flotation process is mainly used to remove gangue from sulphide ores. The ore is powdered, and a suspension is created in the water. To this are added, Collectors and Froth Stabilisers. Collectors (pine oils, fatty acids etc.) increase the non-wettability of the metal part of the ore and allows it to form a froth. Froth Stabilisers (cresols, aniline etc.) sustain the froth. The oil wets the metal, and the water wets the gangue. Paddles and air continuously stir up the suspension to create the froth. This frothy metal is skimmed off the top and dried, to recover the meta.

18. What is the Ozone layer? Write the substances affecting the ozone layer and describe the harmful effects.

Answer: The ozone layer is found in the upper regions of the stratosphere, where it protects the earth from the harmful ultraviolet rays of the sun. The ultraviolet rays split the oxygen molecule into free oxygen atoms; these free oxygen atoms combine with the oxygen molecule to form ozone. This salient layer lies at a distance of 12-15 miles beyond the earth surface. Please find here the substances affecting the ozone layer and its harmful effects.

Or

Write the medicinal importance of the following plants:
(i) Ginger
(ii) Ashwagandha
(iii) Pattarchatta
(iv) Bel
(v) Bhringraj
(vi) Saunf

Answer: (i) Garlic- Allium sativum obtained from stem helps to prevent intestinal problems and is considered as good for digestion. It also helps to fight nausea.
(ii) Ashwagandha- Withania somnifera obtained from the roots is used as a medicinal plant. It is known as a stress alleviator herb.
(iii) Pattarchata propagated from the leaves of a plant is a medicinal herb. This plant has diuretic, wound healing and antimicrobial activities. It is also beneficial for urinary bladder and kidney stones.
(iv) Bel fruit, (Aegle marmelos), is traditionally used as a remedy for dysentery and other digestive ailments.
(v) Eclipta Alba Bhringraj is a preventive herb to stop ageing. It is the best to use Bhringraj in its oil form. Bhringraj oil helps to prevent hair fall.
(vi) Saunf or fennel seeds (Foeniculum Vulgare Miller) is a good source of vitamin C and dietary fibre. It also works as an antacid and also aids in digestion.