MP BOARD CLASS 10 ENGLISH MEDIUM
SCIENCE 2015 QUESTION PAPERS WITH ANSWER

Instructions

(i) All questions are compulsory.
(ii) Q. Nos. 1 to 4 are objective type questions. Each question carries 1 x 5 = 5 marks. Total marks are 5 x 4 = 20.
(iii) Internal options are given in Q. Nos. 5 to 18.
(iv) Marks of each question are indicated against it.
(v) Answer Q. Nos. 5 to 8 in about 30 words each.
(vi) Answer Q. Nos. 9 to 13 in about 75 words each.
(vii) Answer Q. Nos. 14 to 16 in about 120 words each.
(viii) Answer Q. Nos. 17 and 18 in about 150 words each.
(ix) Draw neat and clean labeled diagram wherever required.

Q.1. Fill in the blanks-
(i) Rusting of Iron is the example of . ……. reaction
(ii) We can see the objects in the presence of…..…
(iii) Greater the current in the wire stronger will be the….. produced.
(iv) 1 Horse power watt.
(v) Coal is the ….. source of energy.
Ans. (i) slow, (ii) Light, (iii) magnetic area, (iv) 746, (v) non- Renewable

Q.2. Choose the correct alternative:
(i) Rhizobium is found in-
(a) maize root (b) gram root (c) branch of a plant (d) sugarcane root
Ans. (b)
(ii) The process of fusion of male gamete and female gamete is called-
(a) pollination (b) fertilization (c) cell maturation (d) cell elongation
Ans. (b)
(iii) "Quick Silver" is called-
(a) Ag (b) Al s-(c) Hg (d) Au
Ans. (c)
(iv) How many chambers are there in the heart of human-
(a) Two (b) Three (c) Four (d) Five
Ans. (c)
(v) Excretory products by kidney is-
(a) Ammonia (b) CO2 (c) Urine (d) Sweat
Ans. (c)

Q.3. Choose the correct match the column 'A' from column `B'-

`A'		`B'	
(i)	Titanium	(a)	Venus
(ii)	Carbon	(b)	Strategic metal
(iii)	Sound measuring unit	(c)	Catenation capacity
(iv)	Ginger	(d)	Sun
(v)	Morning Star	(e)	Bulb
		(f)	Rhizone
		(g)	Decibel
		(h)	Noise

Ans. (i-b), (ii-c), (iii-g), (iv-f), (v-a)

Q.4. Write the answer in one sentence each:

(i) What are called Terrestrial planets?

(ii) What is the full form of IUPAC?

(iii) Write down the definition of Ductility.

(iv) Where does Ultra filtration process take place?

(v) Write the full name of ISRO.

Ans. (i) The four innermost planets Mercury, Venus, Earth and Mars have some features in commo with the earth and hence they are called Terrestrial Planets.

(ii)International Union of Pure and Applied Chemistry.

(iii) Ductility- Metals can be drawn into thin wires. This property is known as ductility. The ductility of different metals is different.

(iv) This process takes place in the Bowman's capsule of kidney.

(v) Indian Space Research Organisation.

Q.5 EC What is the power of Lens?

Ans. The ability of a lens to bend the light rays is called power of lens.

A convex lens converge the light rays towards the principal axis whereas a concave lens diverges the light rays away from the principal axis. In this way a lens bends the light rays. A lens of shorter focal length bends the light rays more, and have greater power. Thus power of a lens is defined as the reciprocal of its focal length (f) in metres.

Power of lens P = 1 / f (in meters)

Unit of power of lens is 'metre' and its S.I. unit is `dioptre' which is denoted by 'U. The power of a convex lens a positive and that of a concave lens is negative.

Or Write the name of the lenses used in a compound microscope near object and eye.

Ans. Near Object-Objective Lens, Near eye-Eye-Piece Lens

Q.6 What is electroplating?

Ans: Electroplating : To prevent containers made of iron from corrosion, they are plated by a layer of chromium or nickel to make their surface smooth and shiny. Similarly, silver or other metallic jewelry are plated with a layer of gold to give them golden luster. In the past history of India, people were aware of the process of plating. The process of plating one metal on the other metal by chemical effect of electric current is known as electroplating. It is based on the principle of electrolysis.

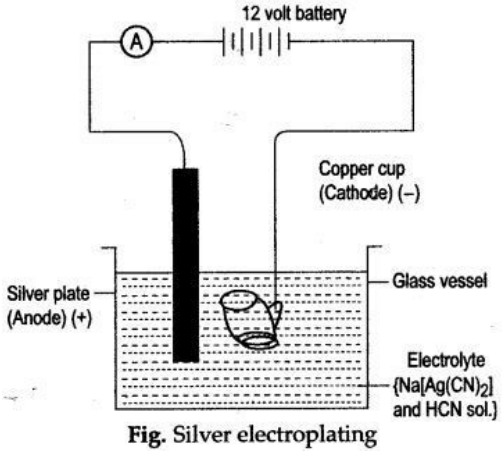


Fig. Silver electroplating

Or **Write Fleming's left hand rule.**

Ans. Fleming's left hand rule- If we stretch out the forefinger, the middle finger and the thumb of the left hand, so that they are mutually perpendicular. Now if the forefinger points the direction of magnetic field, the middle finger points the direction of current then the thumb indicates the direction of force acting on the conductor.

Q.7 What is a Functional Group?

Ans. functional groups are specific groups (moieties) of atoms or bonds within molecules that are responsible for the characteristic chemical reactions of those molecules. The same functional group will undergo the same or similar chemical reaction(s) regardless of the size of the molecule it is a part of. However, its relative reactivity can be modified by other functional groups nearby. The atoms of functional groups are linked to each other and to the rest of the molecule by covalent bonds. Functional groups can also be charged, e.g. in carboxylate salts (–COO−), which turns the molecule into a polyatomic ion or a complex ion. Functional groups binding to a central atom in a coordination complex are called ligands.

Or What is Fehling's solution?

Ans. Fehling's solution is a mixture of alkaline solution of copper (II) sulphate ($CuSO_4$) containing sodium potassium tartarate (Rosehelle salt).

Q.8 Write two main characteristics of Rocket Fuel.

Ans. Characteristics of rocket fuel- The following arc the fundamental characteristics of rocket fuel:

(1) It must be highly combustible and must burn rapidly.
(2) It must emit large volume of gases at very high temperature, pressure and speed.
(3) No residue or smoke should be left after combustion.

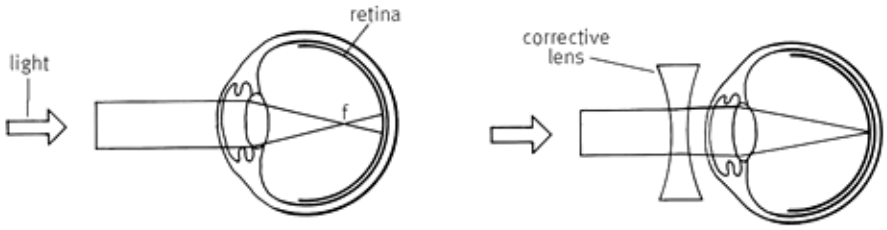
The rocket fuels may be of two types-(i) solid fuel, (ii) liquid fuel.

Or What is Comets?

Ans.- Comets- Comets are the objects which move in highly elongated orbits around the sun. Their central part is solid while outer part is made up of frozen gases like ammonia, Methane, water vapours etc. However it is not a star. Comets are heavenly bodies which revolve around the sun in highly elliptical path. Usually comets come no closer than a few million km to the sun. Their mass is very less. They may be even millionth part of the mass of earth. So far only 1000 comets could be seen. It is believed that they may be more than 100 Arab in number. Most of the comets revolve much beyond the orbit of its outer most planet. Thus, generally, they are not visible from the earth. Normally when they are away from the
sun, they are neither visible nor they have a tail. As they come close to the sun, the frozen gases vaporizer and start glowing. As the distance from the sun reduces, the vaporization increases and hence the length of the tail increases. Due to the presence of this tail, it is also called a "Puchchal Tara". We can see comets when they are closer to the sun because in this position they are closet to the earth too.

Q.9 What is Myopia? Give its reasons. Explain with the help of a labeled ray diagram, how it is corrected?

Ans. Myopia or short sightedness - It is a defect of vision in which the subject is unable to see distant objects distinctly due to the formation of image in front of retina. This defect is corrected by the use of concave spectacles lenses.



Or

Draw the diagram of dispersion of light through prism and show the position of different colors of light obtained on screen.

Ans. When a beam of a white light is passed through a glass prism, is called spectrum.

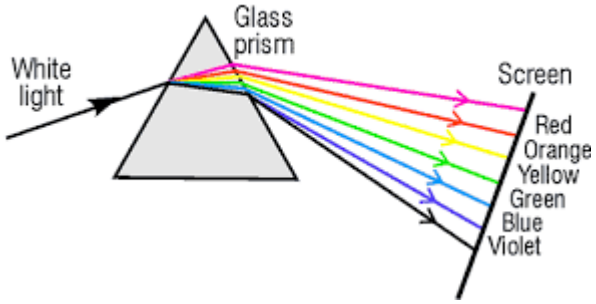


Fig. : A glass prism splits the white light into seven colors.

Q.10 An electric bulb is rated 200V-100W. Find the resistance of the bulb.

Sol.

Given :Power of bulb = 100 Watt.

and potential difference V = 200 volt

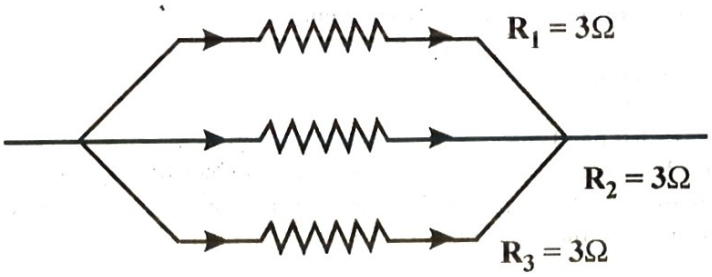
Resistance of bulb R =.?

We know that Power $P= VI$

and by Ohm's law $I= V / R$

So, $P=V^2/R$ watt or $R= (200)^2/100 = 400$ ohms

Or Calculate the resultant resistance when three resistances of 3Q are connected in parallel?



Sol. Suppose R is the total resistance of parallel combination then it is given by

$1/R = 1/R_1 + 1/R_2 + 1/R_3$
Given- $R1 = R2 = R3 = 3\Omega$
$1/R = 1/3 + 1/3 + 1/3 = 1$
Thus $R = 1$ Ohm.

Q.11 Write any four characteristics of an ideal fuel.
Ans. The fuels, which are smokeless and have high calorific value, are known as ideal fuels.

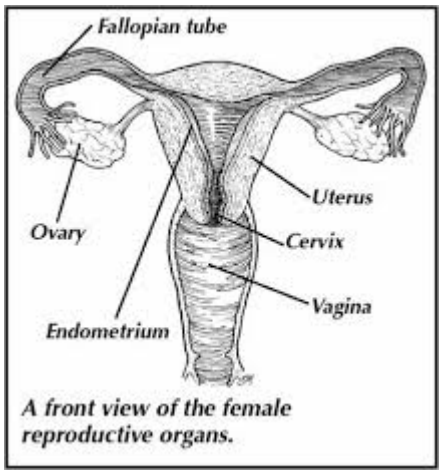
The characteristics of an ideal fuel are :

1. It has high calorific value.
2. It has proper ignition temperature.
3. Balance and complete combustion takes place.
4. It does not produce poisonous products on combustion.

Or Write any four benefits of using solar cooker.
Ans. The sun energizes food without hurting the environment. The air is not contaminated with smoke or greenhouse gases, and no fossil fuels or electricity are required. A SUN OVEN can be used in parks that ban open flame cooking. There is never any danger of fire or of burning food or forests.

Q.12 Explain Mendel's law of segregation.
Ans. Mendel's Law of Segregation or law of purity of gametes- When a pair of contrasting characters is taken in. parent generation. Both the characters remain present in F1 Generation but get segregated in F2 generation as pure. without containminating one another. This is also known as Law of purity of gametes.
For example in monohybrid cross experiment of mendel in F1 Generation long and dwarf characters of plants remain together buts they do not effect each other and he gametes produced were of two types. That is half were of (T) gene where as other half are of (t) gene. That is why mendel postualted that ganete always remain pure.

Or Draw neat and labeled diagram of female reproductive system of human.



A front view of the female reproductive organs.

Q13 Write the IUPAC name and structural formula of the first four member of alcohol homologous series.

Ans.

Name of the member	Molecular Formula	IUPAC Name	Structural formula
(1) Methyl alcohol	CH_3OH	Methanol	H3C — OH
(2) Ethyl alcohol	C_2H_5OH	Ethanol	CH3 — CH2 — OH
(3) Propyl alcohol	C_3H_7OH	Propanol	CH3 — CH2 — CH2 — OH
(4) Butyl alcohol	C_4H_9OH	Butanol	CH3 — CH2 — CH2 — CH2 — OH.

Or How cloth is cleaned with the help of detergents?

Ans. Action of Detergents- When detergent is dissolved in water it forms a colloidal solution. The
detergent molecules of this solution unite together in the form of bunches to form micelle. In the micelle, the detergents molecules are arranged in such a manner that the hydrocarbon end is towards the centre and the ionic part is outside. The grease or only particles of dirty clothes pt attached to the hydrocarbon end of the detergents. Thus the dirt particles get stuck. On rinsing with water, these particles come outside and the cloth becomes clean.

Q.14. Write five important aspects of chemical equilibrium.

Ans.

1) Reversibility: Chemical equilibrium is only related with reversible reactions. It can only be established in reversible reaction.

2) Rate: In chemical equilibrium rate of forward and backward reactions will be equal.

3) Incompleteness of reaction: If equilibrium is established then normally chemical reaction cannot proceed in any direction at equilibrium state, the amount of reactants that react to produce the product, the same amount of product is converted into reactants again.

4) Position of equilibrium state: Reversible reaction can be started from any order, i.e. the reaction may be started with reactants or with the product, but always the equilibrium will be established at the same position.

5) Reaction area: Chemical equilibrium is produced only in closed system from where no substance goes out or no substances enter inside.

Or What is bleaching? Write the chemical name and two main uses of bleaching powder.

Ans. Bleaching- The chlorine gas released from bleaChing powder reacts with water to form Nascent oxygen. This Nascent Oxygen's converts coloured substance to colourless substances, which is known as bleaching

$Cl_2 + H2O$ -> 2HCl + [0] Nascent Oxygen

Coloured + [0] -> Colourless

substance substance

Bleaching powder is calcium Oxychloride, its chemical formula is $CaOCl_2$.

Uses:

(i) As a disinfectant.
(ii) As an oxidant in chemical industry.
(iii) In the purification of water.
(iv) In textile industry and in paper industry for bleaching.

Q.15. Write any five functions of Liver.

Ans. Functions of liver

1. Secretion of bile juice. It is alkaline and decreases acidic effect of food.
2. Excess quantity of glucose in blood in converted into glycogen and stored in the liver.
3. Lipase breaks down fats in to fatty acids.
4. Liver converts ammonia into urea.

5. Liver cells deactivate toxic materials and protect our body.
6. Storage of vitamins. Particularly vitamins A.
7. Synthesis of RBC.

Or " The process of Kreb's cycle occurs in which organ? Write its four features.

Ans.Krebs cycle: It takes place in the inner wall of cristae of mitochondria. It was firstly discovered by an English scientist Kreb hence known as Krebs cycle. In this process, a tricarboxylic acid and citric acid is produced hence it is also known as TCA cycle. The final product of Glycolysis that is pyruvic acid becomes the starting material of TCA cycle. All the changes occurring from pyruvic acid to carbon dioxide and water with the formation of 36 ATP molecules are together known as Krebs cycle. its main characteristics are:

(i) This process takes place inside the mitochondria.

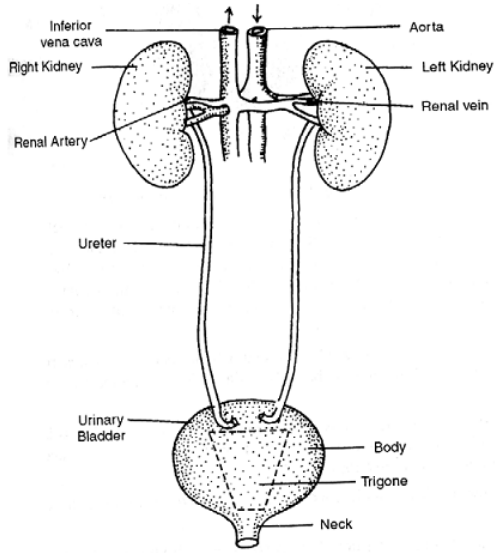
(ii) This process needs oxygen.

(iii) From each molecule of pyruvic acid one molecule each of hydrogen and carbon dioxide is given out, at the beginning of the Krebs cycle. Thus, there are four type of blood groups differentiated on the basis of presence of antigen and antibodies as follows:

(iv) Over all, from one molecule of pyruvic acid 5H2 molecules and 2CO2 molecules are formed hence over all in this process 12 molecules of Hydrogen and 6 molecules of carbon dioxide are released. There is net gain of 36 ATP molecules in this cycle.

Q.16. Draw a labeled diagram of excretory system of human.

Ans.



Or Describe the Blood-groups.

Ans. The blood groups : Landsteiner (1900) of Germany collected samples of blood from different persons, and then he separated the cells from the plasma. Now he mixed different cell samples arbitrarily with any samples of plasma. He found that sometimes the mixing was very smooth but in few instances there is clumping of blood cells. This observation led to the discovery of blood groups.. Today, there are four types of blood groups there are A, B, AB and O . A protein layer found on R.B.Cs. is known as antigen where as there is another protein in the blood plasma known as antibody. The two types of antigen are A and B likewise antibodies are also of two types represented as 'a' and 'b'.

`A and `a', 'B' and 'b' are incompatible and there will be clumping of R.B.Cs. Antigen is absent on R.B.Cs of person having blood group '0'. Hence, Blood group '0' is a universal donor that is can give blood to any of the groups.

Both types of antigens are found on the RBCs of blood group 'AB' but plasma does not contain any antibody. Hence, this group can accept blood from all blood groups, therefore, known as 'Universal Recipients'.

Table - Hence blood groups and their compatibility

Blood Group	Antigens on Red corpuscles	Antibodies in Plama	Can give Blood to	Can get Blood from
A	A	b	A, AB	A, O
B	B	a	B, AB	B,O
AB	AB	None	AB	All
O	None	a, b	All	O

(i) AB blood group contains both antigens A and B but no antibodies in plasma.
(ii) A Blood group contains Antigen A and antibody b.
(iii) B Blood group contains Antigen B and antibody a.
(iv) Blood group 0 contains no antigens, hence no clumping when mixed with any other group.
When blood of opposite groups is mixed with each other it gets coagulated this process is known as coagulation. For e.g. if blood of group A is mixed with that of B. This knowledge of blood group is very essential during blood transfusion or organ transplantation.

Q.17. Write any six chemical properties of metals.
Ans. Properties of metals
(**a) Physical property**- The external properties like state, colour etc are known as physical properties.
1. State- Metals are solid at ordinary temperature (exception Mercury is in liquid state)
2.Malleability- Metals, when beaten or hammered it can be changed into thin sheets. This property is called malleability.
3.Ductility- Metals can be drawn into thin wires, This property is known as ductility. You might have seen Silver foils on sweets. The ductility of different metals are different.
(**b) Chemical properties-** The characteristic properties of the elements due to the electronic configuration are known as chemical properties. Metals are electrically positive in nature.
1. Reaction with oxygen- Metals react with oxygen to form metallic oxides e.g.
4Na + 02 -> 2Na2O (Sodium oxide)
2Mg + 02 2MgO (Magnesium oxide)
4A1 + 302 ---> 2Al203 (Aluminium oxide)
2. Reaction with water- Form metallic hydroxide and hydrogen gas, e.g.
2Na + 2H20 -> 2NaOH + H2 t
Sodium hydroxide
3. Reaction with dilute acids- Formation of hydrogen gas takes place e.g.
2Na 2HC1 -> 2NaC1 + H2 t
Hydrochloric acid (dii)

Or Write any six chemical properties of Non-metals.
Ans. Chemical properties of non-metals
(1) Chemical nature- Chemical nature of non-metals is electronegative i.e., they form anion accepting electrons.
(2) Reaction with oxygen- Non-metals form acidic oxides with oxygen but some oxides are neutral in nature.
2H2 + 02 -> 2H20
2C + 02 -> 2C0
C + 02 -> CO2 S +. 02 -> SO2
Aqueous solution of acidic oxides turns blue litmus to red. S02 + H2O -> 1-11S03
(3) Reaction with chlorine- Non-metals form covalent chlorides with chlorine. H2 -I- 02 2HC1

(4) Reaction with hydrogen- Non-metals form covalent hydrides. H2 -I- S H2S
(5) Displacement reaction- More reactive non-metals displace less reacting non-metals from their salts.
2NaBr + C12 -> 2NaC1 + Br2
Q.18. Describe following medicinal plants- (i) Haldi, (ii) Garlic, (iii) Amla, (iv) Jeera, (v) Maithi, (vi) Mahua
Ans. (i) Haldi- It is an underground stem called rhizome having great medicine value. It is aromatic stimulant antiseptic in nature. So it is used for the treatment of various diseases.
(ii) Garlic- It is obtained from its underground part called bulb. It has great medicinal value. It is used for heart diseases, whooping cough, bronchitis. It has diuretic properties. It is also used to reduce fat from the body.
(iii) Amla- Raw fruits are used to cover the deficiency of vitamin-C. It is used for the treatment of stomach disorder, dysentry, diarrhoea and liver diseases. It is used to cure jaundice.
(iv) Jeera- Fruits of this plant are used for lactating mother. It is also used for digestion and for the treatment of diarrhoea.
(v) Maithi- Seeds and fruits are used as medicines. It is used to reduce fat from the body. It also controls diabetes. It is also used for the treatment of seasonal cold & constipation. It is used to cure nervous disorders.
(vi) Mahua- Leaves, seeds and fruits of the plants are used for the treatment of skin diseases. It is also used to cure seasonal cold & cough.

Or Describe the Biotic components of an Ecosystem.
Ans. Producers, consumers and decomposers are the biotic components of the biosphers.

Producers : Living organisms which produce the food. material for an ecosystem are called producers. Plants containing chlorophyll are in this category. These plants produce food material with the help of chlorophyll in sunlight in the process of photosynthesis.
Consumer : Living-organisms which obtain their food from the producers and are unable to prepare food are called consumers. All animals belongs to this category.
Decomposers : Micro-organisms which decompose the various components of body after the death of plants and animals are called decomposers. They help in decaying.