



B.K. KUMAR'S ACADEMY

Subject : Science -I
Class : X

ANSWERS PAPER 1. Gravitation

Total Marks : 20

Q. 1 A) Choose the correct alternatives.

2

1) Which of the following statement is correct?

Ans.: a) Mass is constant and weight is variable.

2) Escape velocity for an object resting on earth is given by the formula.

Ans.: a) $\sqrt{\frac{2GM}{R}}$

Q. 1 B) Solve the following questions (Any One).

1

1) State whether the following statement is true or false.

The value of g increases with altitude.

Ans.: False

2) Define centripetal force.

Ans.: A force acting on any object moving along a circle & which is directed towards the centre of the circle is called as centripetal force.

3) Considering first correlation complete the second

Acceleration due to gravity : m/s^2 :: Gravitational constant : ----

Ans.: Considering first correlation complete the second

Acceleration due to gravity : m/s^2 :: Gravitational constant : Nm^2/kg^2

Q.2 : A) Give scientific reason (Any One).

2

1) The weight of a body is different on different planets.

Ans.: The weight of an object is the force with which the earth attracts the object

$$\therefore w = F = mg$$

As the value of g is not same on every planet the weight of an object changes on different planet. Therefore the weight of a body is different on different planets.

2) The value of g is zero at the centre of the earth.

Ans.: At the centre of Earth, the force due to upper half of the Earth will cancel the force due to lower half. In the similar manner, force due to any portion of the Earth at the centre will be cancelled due to the portion opposite to it. Thus, the gravitational force at the centre on any body will be 0. Since, from Newton's law, we know

$$F = mg$$

Since, mass m of an object can never be 0. Therefore, when $F = 0$, g has to be 0. Thus, the value of g is zero at the centre of Earth.

Q.2 : B) Solve the following questions (Any 2)

4

1) Distinguish between mass and weight.

Ans.:	Mass	Weight
i)	The quantity of matter contained in a body is mass.	i) Weight is a gravitational force acting on a body by celestial body.
ii)	S.I. Unit of mass is Kilogram (Kg)	ii) S. I. Unit of weight is Newton (N)
iii)	Mass is scalar quantity	iii) weight is vector quantity
iv)	Mass is constant everywhere	iv) Weight changes from place to place.

2) Define : a) Freefall, b) Acceleration due to gravity.

Ans.: a) **Freefall** : The object falling towards earth under the influence of gravitational force of earth is called as freefall.

b) **Acceleration due to gravity** : Acceleration experienced by an object in its freefall is called acceleration due to gravity.

3) Why does low and high tides occur?

Ans.: The level of water in the sea changes because of the gravitational force exerted by the moon. Water directly under the moon gets pulled towards the moon & the level of water there goes up causing high tide at that place. At two place on the earth at 90° from the place of high tide the level of water is minimum and low tides occur there.

Q.3: Solve the following questions (Any 2)

6

1) Why does the feather and the stone do not reach the ground at the same time?

Ans.: The feather has larger surface area and experiences greater air resistance during free fall. The feather experiences a buoyant force and a frictional force due to air and therefore floats and reached the ground slowly later than heavy stone. The buoyant and frictional forces on the stone are much less than the weight of the stone and does not affect the speed of the stone much. where as stone has smaller surface area & so experiences smaller air resistance during freefall. So it falls fast.

2) Write a short note on Gravitational waves.

Ans.: Gravitational waves are a very different type of waves. They have been called the waver on the fabric of space time. They are very weak & it is very difficult to detect them. Scientists have constructed extremely sensitive instruments to detect the gravitational waves.

3) State and explain Newton's law of Gravitation.

Ans.: Newton's law of gravitation states that the gravitational force (F) between two bodies of masses m_1 & m_2 whose centers are separated by distance (d) is :

a) directly proportional to product of masses.

b) inversely proportional to the square of distance between them i. e.

$$F \propto \frac{m_1 m_2}{d^2} \quad F = \frac{G m_1 m_2}{d^2}$$

- 4) If a person weight 750N on earth, how much would be his weight on the Moon given that Moon's mass is 1/81 of that of the earth and its radius is 1/3.7 of that of the earth?

Ans.: Weight on earth = 750N

$$\text{Ratio of mass of the earth } (M_E) \text{ to Mass of the moons } (M_m) = \frac{M_E}{M_m} = 81$$

$$\text{Ratio of radius of earth } (R_E) \text{ to radius of moon } (R_m) = \frac{R_E}{R_M} = 3.7$$

Let the mass of the person be m kg.

$$\text{Weight on the earth} = mg = 750 = \frac{mGM_E}{R_E^2}$$

$$\therefore m = \frac{750R_E^2}{(GM_E)} \dots\dots\dots (i)$$

$$\therefore \text{Weight on Moon} = \frac{mGM_m}{R_m^2} \text{ using (i)}$$

$$= \frac{750R_E^2}{(GM_E)} \times \frac{GM_m}{R_m^2}$$

$$= \frac{750R_E^2}{R_M^2} \times \frac{M_m}{M_E}$$

$$= 75 \times (3.7)^2 \times \frac{1}{81}$$

$$= 126.8\text{N}$$

Q. 4 : Solve the following question (Any one).

5

- 1) In the following figure, an orbit of a planet around the Sun (S) has been shown. AB and CD are the distances covered by the planet in equal time. Lines AS and CS sweep equal areas in equal intervals of time. Hence, areas ASB and CSD are equal.

(a) Which laws do we understand from the above description?

1

(b) Write the law regarding the area swept.

2

(c) Write the law $T^2 \propto r^3$ in your words.

2

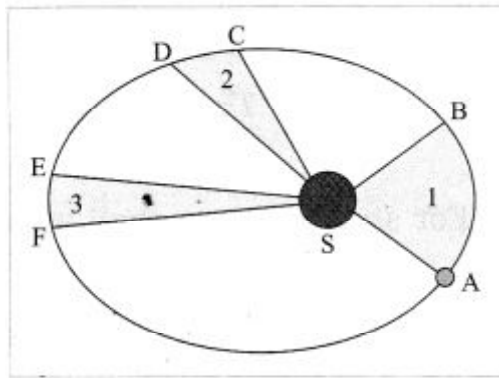


Fig. 1.7 (Schematic diagram)

- Ans:** (a) From the given description we understand Kepler's three laws.
 (b) Kepler's law of areas: The line joining the planet and the Sun sweeps equal areas in equal intervals of time.
 (c) Kepler's law of periods: The square of the period of revolution of a planet around the Sun is directly proportional to the cube of the mean distance of the planet from the Sun.

Or

What happens to the magnitude of the force of gravitation between two objects if

- | | |
|---|----------|
| (a) the distance between the object is tripled? | 1 |
| (b) Mass of both objects is doubled? | 2 |
| (c) Mass of both objects as well as distance between them is doubled?. | 2 |

- Ans:** (a) Let us suppose that R is the distance
 When the distance is tripled, $R = 3R$.
 According to Newton's law,

$$F \propto \frac{1}{R^2}$$

$$F = \frac{1}{3^2}$$

$$F = \frac{1}{9}$$

So, we can say that F is one-ninth of the original value.

- (b) Mass is doubled**

$$M = 2M$$

$$M_1 = 2M_1$$

$$M_2 = 2M_2$$

$$F \propto M_1 M_2$$

So F is 4 times of the original value



B.KUMAR'S ACADEMY

Subject : Science-I

ANSWERS PAPER

Total Marks : 20

Class : X

2. Periodic Classification of Elements

Q. 1 A : Choose the correct alternative.

2

- 1) Element X forms a chloride with the formula XCl_2 which is a solid with a high melting point. X would most likely be in the same group of the periodic table as:

Ans.: b) Mg

- 2) Alkaline earth metal's valency is two, this means that their position in the modern periodic table is in

Ans. : a) Group 2

B) Solve the following question. (Any One)

1

- 1) 1) Match the following.

Ans. :

'A'	Answer
a) Triad	a) Average of the first and the third atomic mass.
b) Octave	b) Properties of eighth element similar to the first

- 2) $_{13}\text{Al}$, $_{14}\text{Si}$, $_{11}\text{Na}$, $_{12}\text{Mg}$, $_{16}\text{S}$ Which of the following elements has the highest metallic character?

Ans.: $_{11}\text{Na}$

- 3) Write the name and symbol of the element from the description.

The most reactive non metal

Ans: Fluorine

Q. 2 : A) Give scientific reason. (Any One)

2

- 1) Elements belonging to the same group have the same valency

Ans.: The valency of an element is determined by the number of valence electron in the outermost shell of an atom of an element. 2) All the elements in a group have the same number of valence electrons. Therefore elements in the same group have the same valency.

- 2) Fluorine is more electronegative than Iodine.

Ans: Fluorine has smaller size than iodine, has more tendency to attract shared pair of electrons towards itself. Therefore fluorine is more electronegative than Iodine.

Q. 2 : B) Solve the following questions. (Any Two)

4

1) **State Mendeleev's periodic law.**

Ans: Mendeleev's periodic law :

Properties of elements are periodic function of their atomic masses.

2) **Write the atomic numbers of two elements 'x' & 'y' having electronic configurations 2, 8, 2 & 2, 8, 6 respectively.**

Ans.: Atomic no. of x = 2 + 8 + 2 = 12

Atomic no. of y = 2 + 8 + 6 = 16

3) **Name any two**

i) **elements having valency 4.**

Ans: Carbon, Silicon

ii) **non metals having valency 3**

Ans. : Nitrogen, Phosphorus

4) **What is mean by dobereiner's triads? Explain with example.**

Ans. : Dobereiner's Triads :

The group of three elements each having similar chemical properties called as triads. The three elements in a triad are arranged in increasing order of atomic mass shows that the atomic mass of the middle element was approximately equal to the mean of the atomic masses of other two elements.

Example :

Triad is Li, Na, K

Atomic mass of Lithium = 6.9

Sodium = 23

potassium, = 39.1

$$\text{Sodium} = \frac{6.9 + 39.1}{2} = 23.0$$

Q. 3 : Solve the following questions. (Any 2)

6

1) **Distinguish between**

Mendeleev's periodic table and modern periodic table (any three points)

Ans. :

Mendeleev's Periodic table	Modern Periodic table
1) Elements arranged in the increasing order of their atomic masses.	1) Elements are arranged in the increasing order their atomic number.
2) There are eight groups.	2) There are eighteen groups.
3) There are 12 periods.	3) There are 7 periods.

2) **An element has its electronic configuration as (2, 8, 2). Now answer the following questions.**

a) **What is the group of this element?**

Ans. : Group 2

b) **In which period does this element belong?**

Ans. : Period number 3

c) With which of the following elements would this element resemble (N, Be, Ar, Cl)
Ans. : Be

3) **Metallic character goes on decreasing while going from left to right in a period. Explain.**

Ans: Metallic character goes on decreasing while going from left to right within a period as the outermost shell remains the same.
 So, the positive charge on the nucleus goes on increasing while atomic radius goes on decreasing & thus the effective nuclear charge goes on increasing. As a result of this the tendency of atom to lose valence electrons decreases within a period from left to right.

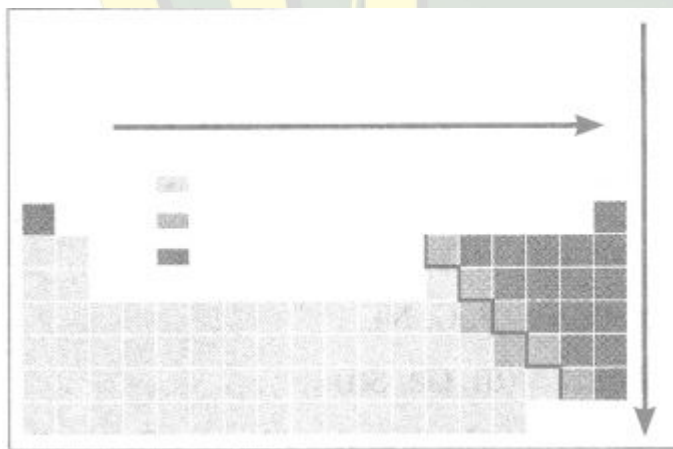
4) **Distinguish between group 1 and Group 2 elements.**

Ans. :	Group - I	Group - II
	i) They have one valence electron ii) They are larger in size iii) They are more metallic iv) Elements are alkali metal	i) They have two valence electrons. ii) They are smaller in size. iii) They are less metallic iv) Elements are Alkaline earth metal

Q. 4 : Solve the following question. (Any One)

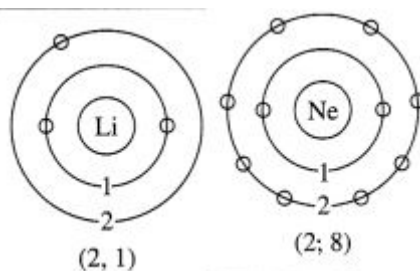
5

1) **write the answers to the questions with reference to the structure of the periodic table.**



- How many groups and periods are present in modern periodic table? **1**
- write the name of blocks indicated? **1**
- Which elements are present near the zig-zag line? **1**
- Draw the electronic configuration of the second-row elements of first group in the periodic table. **2**

Ans: (a) In the modern periodic table there are seven horizontal rows called periods and eighteen vertical columns (1 to 18) called groups.
 (b) On the basis of the electronic configuration, the elements in the modern periodic table are divided into four blocks, viz. s-block, p-block and f-block,
 (c) The metalloid elements lie along the border of the zig-zag line.
 (d) The electronic configuration of the second row elements of the first group in the periodic table is shown below:



2) Observe the figure and answer the following questions.

- (a) Identify the block shown by box A
- (b) write an electronic configuration of any one element of box A
- (c) Identify the block of element denoted by letter B
- (d) write box B period number.
- (e) Which groups are present in d-block?

Ans:

- (a) The block shown by box A is the s-block.
- (b) Electronic configuration of Mg: 2, 8, 2.
- (c) The block of element denoted by letter B is the d-block
- (d) its period number is 4.
- (e) Groups 3 to 12 constitute the d-block



B.K. KUMAR'S ACADEMY

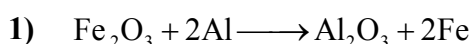
Subject : Science-I
Class : X

ANSWERS PAPER 3. Chemical Reactions and Equations

Total Marks : 20

Q.1:A) Choose the correct alternatives :

2



The above reaction is an example of a

Ans.: d) displacement

2) Which among the following changes are exothermic in nature?

Ans.: c) Both a & b

Q. 1 : B) Solve the following question. (Any One)

1

1) Identify from the following reactions that which element undergo oxidation and reduction.

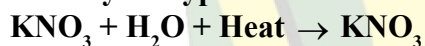


Ans.: Mg – oxidation, O_2 – reduction

2) Define corrosion.

Ans.: **Corrosion** : Due to various components of atmosphere oxidation of metals takes place consequently resulting in their damage. This is called corrosion.

3) Identify the type of reaction



Ans.: Endothermic reaction

Q. 2 : A) Give scientific reason. (Any One)

2

1) It takes time for pieces of shahabad tile to disappear in HCl but its powder disappears rapidly.

Ans.: i) The rate of reaction depends upon the size of the particles of the reactants taking part in the reaction.

ii) Smaller the size of the reactant particles higher is the rate of reaction.

iii) When fine powder is used HCl gets greater surface area so it readily react with HCl and disappear rapidly. The rate of reaction is fast.

iv) But pieces of shahabadi tile get smaller surface area of solid reactant the rate of reaction is slow so it takes time to react with HCl so the pieces of shahabadi tile takes time to disappear in HCl.

2) It is recommended to use air tight container for storing oil for long time.

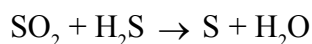
Ans.: i) When oil is left exposed to air for a long time it undergoes oxidation and becomes rancid.

- ii) The process of oxidation reaction of food stuff slows down by storing it in air tight container.
- iii) Therefore, to avoid rancidity it is recommended to use air tight container for storing oil for long time.

Q.2 : B) Solve the following question. (Any Two)

4

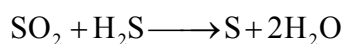
- 1) Balance the following equation stepwise



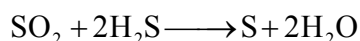
Ans.:

Name of element	L. H. S.	R. H. S.
Sulphur	2	1
Oxygen	2	1
Hydrogen	2	1

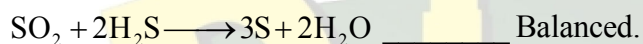
Balancing of Oxygen on R. H. S.



Balancing of Hydrogen on L. H. S.



Balancing of S on R. H. S.



- 2) Explain the following term with example.

a) **Combination reaction** b) **Decomposition reaction**

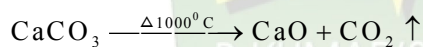
Ans: a) Combination reaction : When two or more reactants combine in a reaction to form a single product is called a combination reaction.

Example : Burning of magnesium strip in air to forms a white powder of magnesium oxide.



b) Decomposition reaction : The chemical reaction in which two or more products are formed from a single reaction is called decomposition reaction.

Example : Calcium carbonate on heating undergoes decomposition reaction to form calcium oxide and carbon dioxide gas is formed which turns limewater milky.



- 3) Write the difference between oxidation and reduction reaction.

Ans:

Oxidation	Reduction
1) The chemical reaction in which reactant gain oxygen or loses hydrogen to form the product called oxidation.	1) The chemical reaction in which reactant gain hydrogen or losses oxygen to form the product is called reduction.
2) A reducing agent under go oxidation.	2) An oxidising agent undergo reduction.
3) Example. $\text{Mg} + \text{O}_2 \longrightarrow 2\text{MgO}$	3) Example. $\text{MgH}_2 \longrightarrow \text{Mg} + \text{H}_2$

4) Define rancidity.

Ans: **Rancidity :** The left over oil kept for a long time get oxidised and have a foul adour and its tastes also change this process is called rancidity.

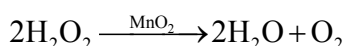
Q. 3 : Solve the following questions. (Any 2)

6

1) How can the rate of the chemical reaction, namely, decomposition of hydrogen peroxide be increased?

Ans:1) The decomposition of hydrogen peroxide into water and oxygen takes place slowly at room temperature.

2) However the same reaction occurs at a faster rate on adding manganese dioxide (MnO_2) powder in it.



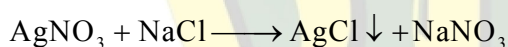
3) Thus, by using a catalyst the decomposition of H_2O_2 can occur rapidly.

2) Define displacement and double displacement reactions. Write equations for these reactions.

Ans: **Displacement reaction :** The reaction in which the place of ion of a less reactive element in a compound is taken by another more reactive element by formation of its own ion is called displacement reaction.



Double displacement reaction : The reaction in which the ions in the reactants are exchanged to form a precipitate are called double displacement reaction.



3) Study the entries in the following table and rewrite them putting the connected items in a same row.

Ans:

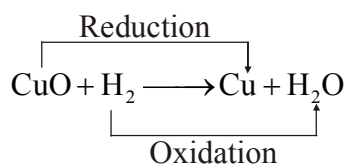
Reactant	Product	Types of chemical reaction
$\text{Fe} + \text{S}$	FeS	Combination
$\text{CuSO}_4 + \text{Zn}$	$\text{ZnSO}_4 + \text{Cu}$	Displacement
$2\text{Cu} + \text{O}_2$	2CuO	Oxidation

4) What is the reaction called when oxidation and reduction take place simulataneously? Explain with one example.

Ans: When oxidation and reduction reaction takes place simultaneously in single reaction the reaction is called as redox reaction.

Redox reaction = Reduction + oxidation

Example : When hydrogen gas is passed over black copper oxide a reddish coloured layer of copper is formed.



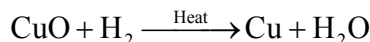
1) In redox reaction one reactants gets oxidised while other gets reduced during a reaction.

- 2) In this reaction copper oxide lost oxygen that means reduction of copper oxide takes place where as hydrogen molecules takes up oxygen to form water molecule that means oxidation of hydrogen takes place.
- 3) Thus reduction of CuO and oxidation of H₂ occurs simultaneously in given reaction.

Q. 4 : Solve the following question. (Any One).

5

- 1) Consider the chemical equation given below and answer the question that follow.



- i) Name the substance which is getting oxidised. ii) Name the oxidising agent.
 iii) Name the substance which is getting reduced. iv) Name the reducing agent.
 v) What type of a reaction does this equation represent?

Ans. : i) The substance getting oxidised is H₂.

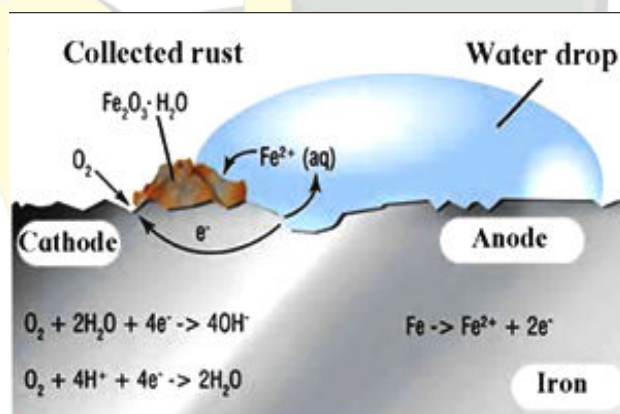
ii) CuO is the oxidising agent.

iii) The substance getting reduced is CuO.

iv) H₂ is the reducing agent.

v) Since oxidation and reduction is taking place simultaneously, this reaction is an example of redox reaction.

- 2) Observe the following picture and write down the answer of the following questions.



a) Which process is shown in the figure?

b) Explain the chemical reaction shown in the figure.

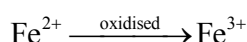
c) Write the reactions on anode and cathode

Ans:

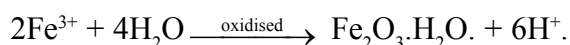
a) The given picture shows the process of rusting of iron.

b) The rust is formed by an electrochemical reaction. Different regions on the surface of iron become anode and cathode.

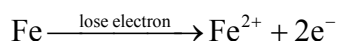
When Fe^{2+} ions migrate from the anode region they react with water and further get oxidised to form Fe^{3+} ions.



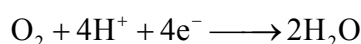
A reddish coloured hydrated oxide is formed from Fe^{3+} ions. It is called rust it collects on the surface.



c) Anode Reaction : Fe is oxidised to Fe^{2+} in the anode region.



Cathode reaction : O_2 is reduced to form water in the cathode region.





B.K. KUMAR'S ACADEMY

Subject : Science-I
Class : X

ANSWERS PAPER 4. Effects of electric current

Total Marks : 20

Q.1 A) Choose the correct alternative :

2

1) The phenomenon of electromagnetic induction is :

Ans: c) Producing induced current in a coil due to relative motion between a magnet and the coil.

2) The essential difference between an AC generator & a DC generator is that.

Ans: d) AC generator has split rings while DC generator has a commutator.

B) Solve the following question. (Any One)

1

1) Find the odd one out

Fuse wire, bad conductor, rubber gloves, generator.

Ans: generator

2) Why does two magnetic field of lines never intersect?

Ans: Two magnetic field lines can never intersect each other because two tangents that can be drawn from that point of intersection which will give two directions of magnetic field from same point which is impossible.

3) Match the following :

Ans:

'A'	Answer
i) Electric current	i) Ampere
ii) Electric power	ii) watt

Q. 2 : A) Give scientific reason (Any One)

2

1) For electric power transmission, copper or aluminum wire is used.

Ans: Copper or aluminum are good conductors of electricity with low resistivity, therefore they are used for electric power transmission.

2) In the electric equipment producing heat e.g. iron, electric heater, boiler, toaster etc an alloy such as Nichrome is used not pure metal.

Ans: i) Electric iron, heater etc are based on heating effect of electric current

ii) Nichrome is a resistive alloy. It allows electricity to pass through it and offers some resistance that produce heat.

- iii) The amount of heat produced depends on magnitude of current and resistance offered.
- iv) On the other hand pure metals have low resistivity i.e. if maximum current is passed then they can not produce more heat.
- v) Therefore nichrome is used in electrical equipments and is not pure metals.

Q. 2 : B) Solve the following questions : (Any Two)

4

1) State right hand thumb rule.

Ans.: Right hand thumb rule :- Imagine the conductor to be held in right hand with the fingers curled round and thumb stretched along length. If the thumb points in direction of current then the turned fingers indicate direction of magnetic lines of force.

2) Which appliance will consume more electrical energy, 500 W TV set in 30 mins or 600 W heater in 20 mins?

Ans: Given : Case I = T. V. Case II = heater

$$P = 500\text{W}$$

$$P = 600\text{W}$$

$$T = 30\text{min}$$

$$T = 20\text{min}$$

$$= 30 \times 60 \text{ sec}$$

$$= 20 \times 60\text{sec}$$

$$\text{Formula } P = \frac{E}{T}$$

$$\therefore E = P \times T$$

$$= 500 \times 60 \times 30$$

$$= 9,00,000\text{J/s.}$$

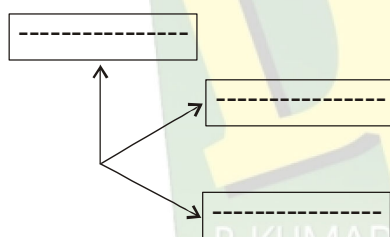
$$E = P \times T$$

$$= 600 \times 20 \times 60$$

$$= 7,20,000\text{J/s.}$$

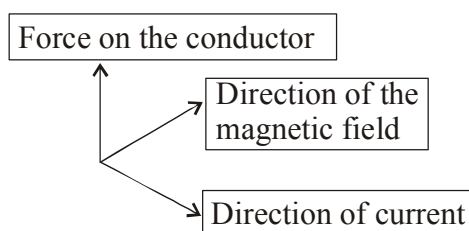
$\therefore$ Television will spend more electrical energy.

2) State Fleming's left hand rule and label the following diagram.



Ans: Fleming's left hand rule :

The left hand thumb, index finger and middle finger are stretched so that they are perpendicular to each other. If the index finger is the direction of magnetic field and middle finger points in direction of current then thumb is the direction of force on the conductor.



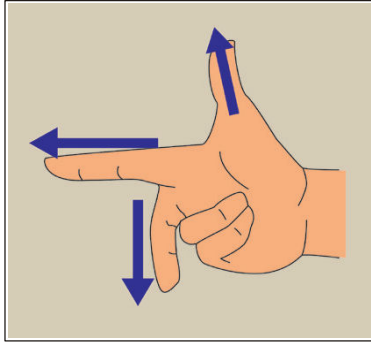
4) **State Joule's law of heating.**

Ans: **Joule's law of heating :** When an electric current is passed through a conductor, it produces heat mathematically $H = I^2 R t$. Heat produced is directly proportional to the square of the current, resistance and time.

Q. 3 : Solve the following questions in brief (Any 2) :

6

1) **Name the following diagram and explain**



Ans. : The diagram is of Fleming's right hand thumb rule.

From above figure :

- i) Indicates the motion of conductor.
- ii) Indicates direction of magnetic field.
- iii) Indicates direction of induced current.

Fleming's right hand thumb rule :

- i) Stretch the thumb, index finger, and middle finger of right hand in such a way that they will be perpendicular to each other.
- ii) In this position the thumb indicate the direction of motion of conductor, the index finger the direction of magnetic field and middle finger shows the direction of induced current.

2) **How does the short circuit occur? What is its effect?**

Ans. : Short circuiting occurs when live wire & neutral wires come in contact with each other. Due to this resistance of the circuit becomes very small & huge amount of current flows through the circuit which in turn produces more heat and causes fire.

3) **Heat energy is being produced in a resistance in a circuit at the rate of 100 W. The current of 3A is flowing in the circuit. What must be the value of the resistance?**

Ans. : **Given :** $P = 100\text{W}$

$$I = 3\text{A}$$

$$R = ?$$

$$I = \frac{P}{V}$$

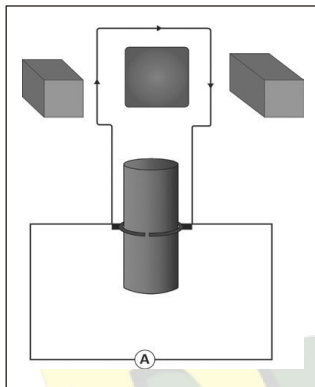
$$\therefore V = \frac{P}{I} = \frac{100}{3} = 33.3\text{ V.}$$

$$P = VI = V \times \frac{V}{R} = \frac{V^2}{R}$$

$$P = \frac{V^2}{R}$$

$$\therefore R = \frac{V^2}{P} = \frac{(33.3)^2}{100} = \frac{1,108.89}{100} = 11\Omega$$

4) Observe the figure and answer the following questions.



- Identify the machine shown in figure.
- Write a use of this machine.
- How transformation of energy takes place in this machine?

Ans.:

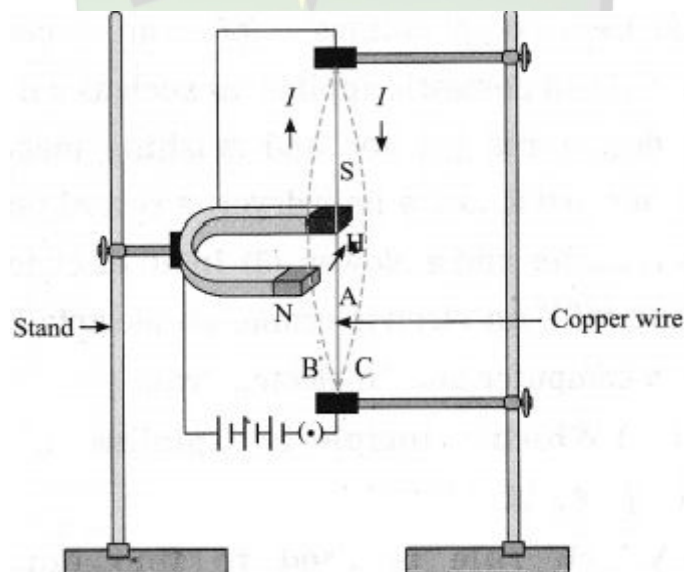
- This instrument shown in the figure is an electric generator.
- This machine is used to generate electricity
- The generator generates electricity through the following transformation. Mechanical energy is converted into electric energy.

Q.4: Solve the following question. (Any One)

5

- (i) Which principle is explained in this figure?

1



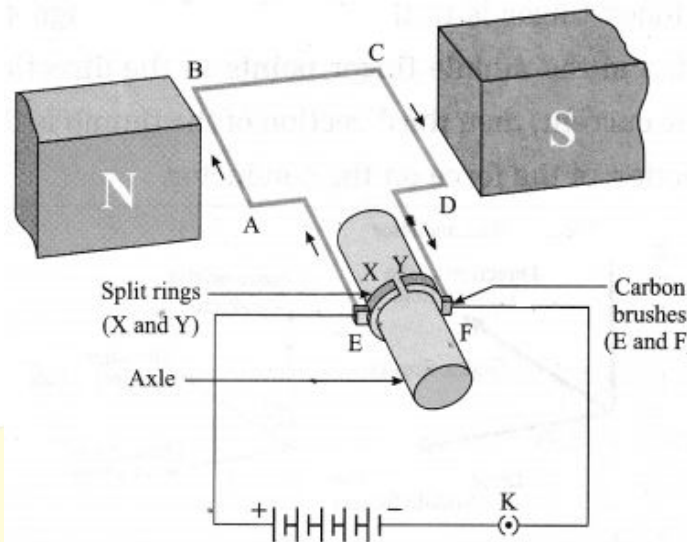
(ii) Which rule is used to find out the direction of force in this principle?

1

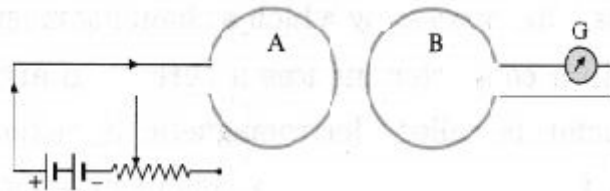
(iii) In which machine is this principle used? Draw a diagram showing the working of that machine.

2

- Ans:
- (i) A force is exerted on a current-carrying conductor in the presence of a magnetic field.
 - (ii) Fleming's left hand rule is used.
 - (iii) Electric motor.



2) Observe the following figure and answer the following questions.



- a) If the current in the coil A is changed, will some current be induced in the coil B? 1
- b) Which phenomenon is used in this experiment? 1
- c) What is electromagnetic induction? 2

- Ans:
- a) If the current in the coil A is changed, there will be some current induced in the coil B.
 - b) The phenomenon which is used in this experiment is known as electromagnetic induction.
 - c) The process by which a changing magnetic field in a conductor induces a current in another conductor is called electromagnetic induction.



B.KUMAR'S ACADEMY

Subject : Science -I
Class : X

Answer Paper **5. Heat**

Total Marks : 20

Q.1 A : Choose the correct alternative :

2

- Ans. :**
- 1) The amount of water vapour in air is determined in terms of its **humidity**.
 - 2) During transformation of liquid phase to solid phase the latent heat is **Fusion**

B. Solve the following questions. (Any One).

1

- 1) **State whether the following statement is true or false.**

During transition of solid phase to liquid temperature of object increases.

Ans. : False

- 2) **Complete the analogy.**

SI unit of heat : _____ : : CGS unit of heat : _____

Ans. : SI unit of heat : **J** : : CGS unit of heat : **Calorie**.

- 3) **Define one cal heat.**

Ans. : One cal heat :

The amount of heat necessary to raise temperature of 1g of water by 1°C from 14.5°C to 15.5°C is called 1 cal heat.

Q. 2 : A) Give scientific reason. (Any One)

2

- 1) **Aquatic plants and animals can survive even when atmospheric temperature goes below 0°C.**

Ans. :

- i) Water expands on heating and contracts on cooling. When water contracts its density increases as the volume decreases.
- ii) Water behaves like normal liquid up to 4°C. But when it is cooled from 4°C to 0°C it expands instead of contracting. Hence its volume increases.
- iii) When temperature of lakes start getting cold water on upper side in contact with air falls to 4°C. Thus its density increases as volume decreases and starts to move in bottom.
- iv) This happens till all temperature falls till 0°C. At 4°C water expands instead of contracting and moves up as density is decreased. So water at top becomes 0°C and converts into ice - But water below ice still remains at 4°C.

Thus aquatic plants and animals can survive even when temperature goes below 0°C due to anomalous behaviour of water.

- 2) **During winter season a white trail at back of flying plane is observed in a clear sky.**

Ans. :

- i) When a plane flies in the air the vapour released by the aeroplane engine condenses and forms clouds.
- ii) The relative humidity i.e. vapour content in air to make it saturated gets more because of condensation.
- iii) Thus air there becomes greater than the dew point temperature and thus leads to formation of clouds.

- iv) If air is having more relative humidity then it takes long time for white trail to disappear.
- v) If the relative humidity is less the size of white trail may be small or it may even not get formed.

Q.2 : B) Solve the following question (Any Two)

4

- 1) **How much heat energy is necessary to raise the temperature of 5kg of water from 20°C to 100°C?**

Ans. : **Given :** $m = 5\text{kg}$, $C = 1 \text{ Kcal / Kg}^\circ\text{C}$ & $\Delta T = 100 - 20 = 80^\circ\text{C}$

$$\begin{aligned}\text{Energy to be supplied to water} &= \text{energy gained by water} \\ &= \text{mass of water} \times \text{specific heat of water} \times \text{change in temperature of water} \\ &= m \times c \times \Delta T \\ &= 5 \times 1 \times 80^\circ\text{C} \\ &= 400 \text{ Kcal}\end{aligned}$$

- 2) **Write down the units of specific heat capacity.**

Ans. : The SI unit is $\text{J}^\circ\text{C kg}$. The CGS unit is $\text{cal/g}^\circ\text{C}$

- 3) **What is relative humidity & % relative humidity?**

Ans. : The ratio of actual mass of vapour content in the air for a given volume & temperature to that required to make the air saturated with vapour at that temperature is called the relative humidity.

$$\% \text{ Relative humidity} = \frac{\text{actual mass of vapour content in air}}{\text{Mass of vapour needed to make air saturated}} \times 100$$

- 4) **What is the dew point temperature?**

Ans. : When unsaturated air at a certain temperature is taken and its temperature is decreased a temperature is reached at which the air becomes saturated with vapour. This temperature is called the dew point temperature.

Q.3 : Solve the following questions. (Any Two)

6

- 1) **Explain Regelation.**

Ans. : The phenomenon in which the ice converts to liquid due to applied pressure and then reconverts to ice once the pressure is removed is called regelation. The melting point of ice becomes lower than 0°C due to pressure. This means that at 0°C , the ice gets converted into water. As soon as the pressure is removed, the melting point is restored to 0°C & water gets converted into ice again.

- 2) **Explain the role of latent heat in change of state of a substance.**

Ans. :

- i) The heat energy required to convert a solid into liquid or a liquid into vapour without the change of temperature is called as latent heat.
- ii) When a solid is heated it gets transformed to liquid phase during this transition the object absorbs heat energy but its temperature does not increase.
- iii) This heat energy absorbed at constant temperature is called as latent heat. This latent heat is given off in solids to transform into liquid phase and is called latent heat of fusion.
- iv) Similarly when liquid is heated from 0°C to 100°C the heat energy is absorbed at constant temperature i.e. latent heat is given off in liquid to gas state transition. This is called as latent heat of vaporisation.

- 3) **A Calorimeter has mass 100g and specific heat 0.1 kcal/kg $^\circ\text{C}$. It contains 250 gm of liquid at 30°C having specific heat of 0.4 kcal/kg $^\circ\text{C}$. If we drop a piece of ice of mass 10g at 0°C what will be the temperature of mixture.**

Ans. : Given :

$$M_{\text{cal}} = 100\text{g}$$

$$C_{\text{cal}} = 0.1 \text{ k cal/ kg } ^\circ\text{C}$$

$$M_{\text{liq}} = 250 \text{ gm}$$

$$C_{\text{liq}} = 0.4 \text{ k cal/kg } ^\circ\text{C}$$

$$M_{\text{ice}} = 10\text{g}$$

To find $T(\text{mix}) = ?$

Suppose the liquid and the ice mixture attain final temperature T Here

Heat gained by ice = heat lost by liquid + heat lost by Calorimeter.

$\therefore$ Heat gained to convert ice at 0°C to Water at 0°C

$$= M_{\text{ice}} \times C_{\text{ice}} \times \text{latent heat}$$

$$= 10 \times 1 \times 80$$

$$= 10 \times 80$$

latent heat of fusion of ice = 80 cal/g

Heat gained to convert water at 0° to attain temperature T

$$= M_{\text{ice}} \times C \times (0 + T)$$

$$= 10 \times 1 (0 + T)$$

$$= 10 T$$

Total heat gained by ice = $10 \times 80 + 10 T$

Heat lost by liquid = $M_{\text{liq}} \times C_{\text{liq}} \times (30 - T)$

$$= 250 \times 0.4 \times (30 - T)$$

By principle of heat exchange

Heat gained by ice = heat lost by liquid + heat lost by calorimeter.

$$10 \times 80 + 10T = 250 \times 0.4 \times (30 - T) + 100 \times 0.1 \times (30 - T)$$

$$800 + 10T = 100 (30 - T) + 10 (30 - T)$$

$$800 + 10T = (100 + 10) (30 - T)$$

$$800 + 10T = 110 \times 30 - 110T$$

$$800 + 10T = 3300 - 110T$$

$$120T = 3300 - 800$$

$$T = \frac{2500}{120}$$

$$T = 20.8^\circ\text{C}.$$

4) Which principle is used to measure specific heat capacity of a substance?

Ans. : i) The principle of heat exchange is used to measure specific heat capacity of a substance, states that

"Energy lost by hot Object = Energy gained by cold object"

ii) The specific heat of a substance is measured using mixing method for this calorimeter is used.

iii) It hot solid object is put in water in a calorimeter heat exchange between hot object and water and calorimeter starts. This continues till the temprature of solid object water and calorimeter becomes equal.

iv) Heat lost by hot object = heat gained + heat gained by calorimeter (Q_2)

(Q) by water (Q_1)

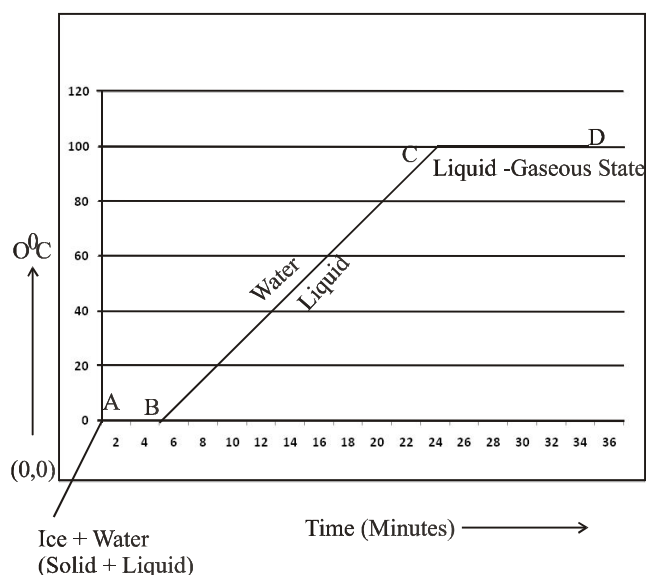
$$\therefore Q = Q_1 + Q_2$$

Of specific heat of water and calorimeter are known specific heat of solid object can be calculated.

Q. 4 : Solve the following question. (Any One)

5

1) Observe the following temperature v/s time graph.and answer the following question



a) What is represented by line AB? 1

Ans. : Line AB represents conversion of ice into water at constant temperature i.e. latent heat of fusion.

b) Why the temperature remains constant when ice is converted into liquid? 2

Ans. : Till the transition of ice into liquid is completed temperature remains constant because during this energy is absorbed in weakening the bonds.

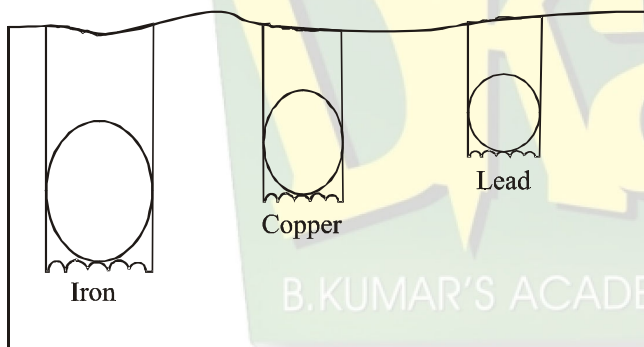
c) What is the temperature represented by line BC? 1

Ans. : Line BC in the graph represents rise in temperature of water 0°C to 100°C

d) What is represented by line CD? 1

Ans. : Line CD is representing the constant temperature where boiling takes place. i.e. latent heat of vapourization

2) Observe the following temperature v/s time graph. and answer the following question



a) What is meant by specific heat capacity? 2

Ans. : **Specific heat capacity :** The amount of heat energy required to raise the temperature of a unit mass of an object by 1°C is called the specific heat capacity of that object.

b) Which sphere absorb more heat? 1

Ans. : Sphere which is made up of iron absorb more heat.

c) Which sphere is having more specific heat? 1

Ans: Iron sphere is having more specific heat.

d) Upto what depth the copper sphere goes inside the wax? 1

Ans: The copper sphere goes upto intermediate depth



B.K. KUMAR'S ACADEMY

Subject : Science -I
Class : X

Answer Paper **6. Refraction of Light**

Total Marks : 20

Q.1: A) Choose the correct alternative :

2

- 1) When white sunlight passes through a glass prism ----- ray deviates the most.

Ans. : c) Violet

- 2) When ray of light are incident on glass slab then incident ray and emergent ray are ----- to each other.

Ans. : b) Parallel

B) Solve the following questions. (Any One)

1

- 1) Give the corelation.

Refractive index of air : _____ : : Refractive index of glass : 1.52

Ans. : Refractive index of air : 1 : : Refractive index of glass : 1.52

- 2) State whether the following statement are true or false.

The wavelength of light depends on velcity of light in that medium.

Ans. : True

- 3) Define - Refraction of light.

Ans. : Refraction of light :

Light changes its direction when going from one transparent medium to another transparent medium. This is called refraction of light.

Q.2: A) Give scientific reason. (Any One)

2

- 1) Stars twinkle at night.

Ans. : i) Stars are self luminous and can be seen at night in the absense of sunlight.

ii) The stars are point sources of light. The light coming from the stars travels from rarer medium to denser medium and costantly bends towards the normal.

iii) So the apparent position of star is slightly higher than actual position.

iv) Due to motion of atmospheric air refractive index of air keeps changing continuously.

v) When the atmosphere refracts more light towards us star is seen bright and when the atmosphere refracts less light towards us star is seen dim. Thus due to change in refractive index of atomosphere stars twinkle at night.

- 2) The sun is seen on the horizon a little before sunrise and even after sunset for same time.

- Ans. :**
- i) The earth is surrounded by the atmosphere which is denser near the surface of the earth.
 - ii) When the rays of sun enters the earth's atmosphere from outer space they travel from rare medium to denser medium.
 - iii) Therefore light rays bends towards the normal due to refraction i.e. the light rays travels a curved path.
 - iv) The apparent position of sun is appears above the horizon.
 - v) Thus even when rising or seting the sun is seen on the horizon before sunrise and after sunset for sometimes.

B) Solve the following question. (Any Two)

4

- 1) The absolute refractive index of water is 1.36. What is the velocity of light in water? (velocity of light in vacuum 3×10^8 m/s)**

Ans. : Given :

$$V_1 = 3 \times 10^8 \text{ m / s}$$

$$n = 1.36$$

$$n = \frac{v_1}{v_2}$$

$$\therefore 1.36 = \frac{3 \times 10^8}{V_2}$$

$$v_2 = \frac{3 \times 10^8}{1.36}$$

$$= 2.21 \times 10^8 \text{ m / s}$$

- 2) Define :**
- a) Dispersion of light
 - b) Absolute refractive index.

Ans. : a) Dispersion of light : The process of separation of white light into it's component colours while passing through a medium is called the dispersion of light.

b) Absolute refractive index : The refractive index of a medium with respect to vaccum is called absolute refractive index.

- 3) State the laws of refraction.**

Ans. : Following are the laws of refraction.

- i) Incident ray & refracted ray lie on the opposite sides of the normal whereas all the three lie in the same plane.
- ii) For a given pair of media, the ratio of $\sin i$ to $\sin r$ is a constant where i & r are angle of incidence & angle of refraction respectively.

4) Explain the concept of mirage.

Ans. :

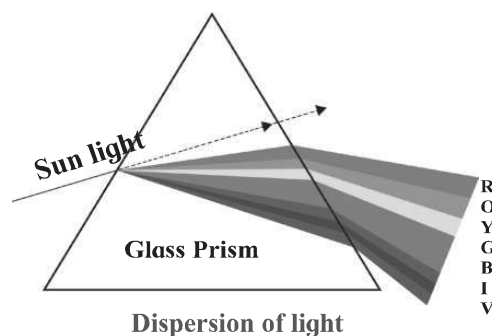
- i) A mirage which is an illusion of appearance of water on hot road or desert surface.
- ii) The air near hot road or desert surface is hot and hence rarer than air above it. The refractive index of air keeps on increasing with increasing heights.
- iii) In this case direction of light rays coming from distance keeps changing according to laws of refraction.
- iv) The rays appears to be coming from the image of object inside the ground. This is called mirage.

Q.3: Solve the following questions. (Any Two)

6

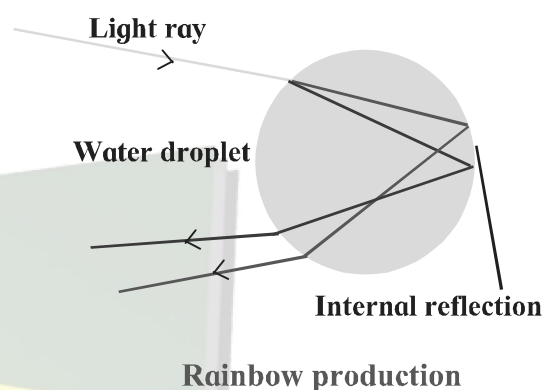
1) With neat diagram explain the dispersion of light

Ans. : i) The process of separation of light into its component colours while passing through a medium is called the dispersion of light. ii) When white light is incident on the prism different colours bend through different angles. Among the seven colours red bends the least while violet bends the most. Thus as shown in fig. the seven colours emerge along different paths and get separated and we get a spectrum of seven colours.



2) Explain. A rainbow is the combined effect of refraction, dispersion and total internal reflection of light.

Ans. : i) A rainbow is seen mainly after a rainfall. It is always formed in a direction opposite to the sun. ii) When light ray enters the water droplet it enters from rarer medium air to denser medium water and hence bends towards normal. Thus refraction takes place inside the water droplet. iii) This process continues till the angle of refraction becomes 90° for angle of incidence larger than critical angle the angle of refraction is larger than 90° and so the rays return to water and gets reflected back in the same medium. Thus total internal reflection takes place inside water droplet. iv) Now the sun light is consisting of white light, when light rays from the sun enter the water droplet it act as small prisms. v) So a spectrum of seven colors is obtained. Here violet light bends the most and red light bends the least. Thus the phenomenon of dispersion takes place. vi) The combined effect of refraction, dispersion and total internal reflection of light produces a rainbow.



3) Will the light travels through glass slab with same velocity as it travels in air? Why?

Ans. : i) The refractive index of a medium depends on velocity of light in the medium. The refractive index is given by

$$\text{Refractive index } 2_{n_1} = \frac{\text{Velocity of light in medium 1 (V}_1\text{)}}{\text{Velocity of light in medium 2 (V}_2\text{)}}$$

2_{n_1} is the refractive index of second medium with respect to first medium.

ii) The refractive index of glass is 1.52 while refractive index of air is 1.00. Thus due to different refractive index the velocity of light in glass slab is different than in air.

4) What is refractive index of second medium wrt first medium, if light moves through first medium with a velocity 2×10^8 m/s which changes to 1.25×10^8 m/s second medium?

Ans. : Given :

$$V_1 = 2 \times 10^8 \text{ m/s}$$

$$V_2 = 1.25 \times 10^8 \text{ m/s}$$

$$2^{\text{n}}1 = \frac{V_1}{V_2}$$

$$= \frac{2 \times 10^8}{1.25 \times 10^8}$$

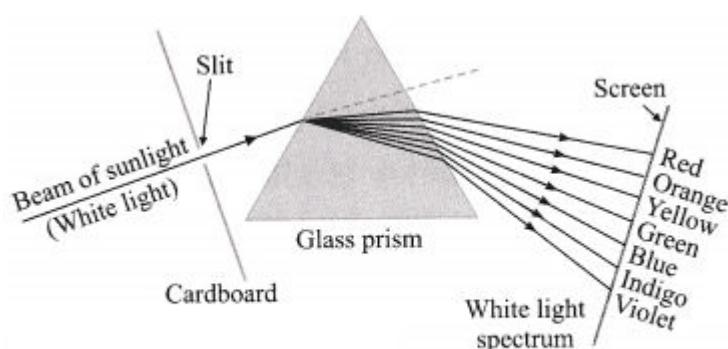
$$2^{\text{n}}1 = 1.6$$

The refractive index of second medium wrt first is 1.6.

Q. 4: Solve the following question. (Any One)

5

- 1) **Observe the following temperature v/s time graph.and answer the following question**



a) What is spectrum?

2

Ans: The band of seven colour is called as spectrum.

b) Which colour of light is deviate most?

1

Ans: Violet colour of light is deviate most.

c) Which colour of light is deviate least?

1

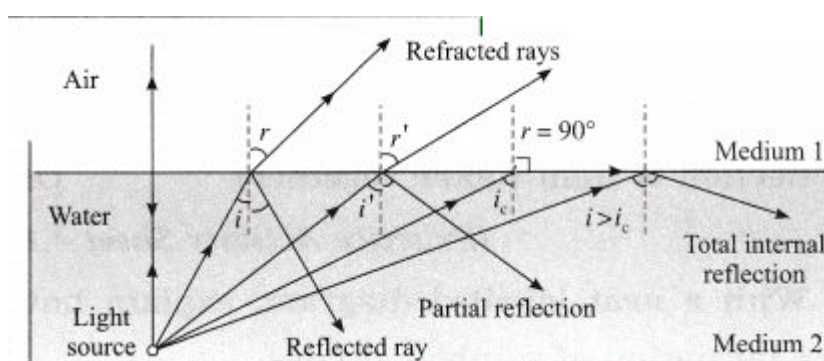
Ans: Red colour of light is deviate most.

d) Which colour is having more wavelength?

1

Ans: Red colour is having more wavelength.

- 2) **Observe the following diagram and answer the following question**



a) Define total internal reflection.

2

Ans: It is the phenomenon when a ray of light travelling in a denser medium, is incident at the surface of a rarer medium such that the angle of incidence is greater than the critical angle for the pair of media, the ray is totally reflected back into the denser medium.

b) Define critical angle.

1

Ans: The angle of incidence in the denser medium for which the angle of refraction in the rarer medium is 90° is called as critical angle.

c) In the above light is going from which medium?

1

Ans: Light is going from denser medium.

d) Define partial reflection.

1

Ans: When a ray of light enters a rarer medium from a denser medium, it gets partially reflected i.e., part of the light gets reflected and comes back into the denser medium obeying the laws of reflection. This is called partial reflection.





B.KUMAR'S ACADEMY

Subject : Science -I

Answer Paper

Total Marks : 20

Class : X

7. Lenses

Q.1: A) Choose the correct alternative :

2

- 1) A small aperture in iris which controls intensity of light is called -----.

Ans. : c) Pupil

- 2) The lens which is thin at centre and thick at edges is -----.

Ans. : b) Concave lens

B) Solve the following questions : (Any One)

1

- 1) Find the odd man out

Medical equipment, torch, scanner, spectograph

Ans. : Spectograph.

- 2) Complete the analogy.

Convex lens : Converging lens :: Concave lens : -----

Ans. : Convex lens : Converging lens :: Concave lens : Diverging lens.

- 3) Write true or false.

The power of lens depends on its focal length

Ans. : True

Q.2: A) Give scientific reason. (Any One)

2

- 1) A concave lens is used to correct myopia.

Ans. : i) In myopia the person can see nearby objects clearly but cannot see the distant object.

ii) The image of the object at distance is formed in front of retina.

iii) Concave lenses are diverging lenses when the rays of light are incident on the eye this lens diverge the rays and these diverged rays can be converged by the lens in the eye to form image on the retina.

iv) Hence concave lenses are used to correct myopia.

- 2) In old age bifocal lens is necessary for some person.

Ans. : i) The ciliary muscles near the lenses lose their ability to change the focal length of the lens. Due to this the focussing power of lens decreases with age.

ii) This effect is called presbyopia. Sometimes people suffer from both myopia and hypermetropia.

iii) To correct these defects a bifocal lens is used.

B) Solve the following question. (Any Two)

4

1) Explain the terms a) Centre of curvature b) Optical centre

Ans. : **a) Centre of curvature :** The centers of spheres whose parts form surfaces of the lenses are called centres of curvatures of the lenses.

b) Optical centre : The point inside a lens on the principal axis, through which light rays pass without changing their path is called the optical centre.

2) What is lens formula?

Ans. : The formula showing the relation between distance of the object (u), the distance of the image (v) & the focal length (f) is called the lens formula.

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

3) What is persistence of vision? Why one can sense color only in bright light?

Ans. : **Persistence of vision :**

The image formed on retina remains imprinted for $\frac{1}{6}$ th of a second after the object is removed.

This sensation on retina persist for a while. This is called persistence of vision.

i) The retina is made up of many light sensitive cells. These cells are in shape like rod and cone. The rod cells respond to intensity of light while conical cells responds to colors.

ii) Brain processes all the information received and we see actual image of the object.

iii) Rod cells respond to faint light but conical cells do not. Thus one can see colors in bright light only.

4) A concave lens of focal length 12 cm and convex lens of focal length 20 cm are kept in contact with each other. Find the focal length of their combination and its power.

Ans. : f_1 (concave lens) = - 12cm

f_2 (convex lens) = 20cm

f (combination) = ?

$$\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2}$$

$$= \frac{1}{-12} + \frac{1}{20}$$

$$= \frac{-5 + 3}{60}$$

$$= \frac{-2}{60}$$

$$= \frac{-1}{30}$$

$$f = -30\text{cm}$$

$\therefore$ focal length of combination $= -30\text{cm}$

$$f = 30\text{cm} = -0.3\text{m}$$

$$\therefore P = \frac{1}{f(\text{m})} = -\frac{1}{0.3}$$

$$P = -3.33 \text{ D.}$$

Q.3: Solve the following questions. (Any Two)

6

- 1) At which position will you keep an object in front of a convex lens so as to get a real image of the same size as the object? Draw a figure.

Ans. : At $2F_1$, Position if we keep the object in front of a convex lens we will get the real image of same size as that of the object.

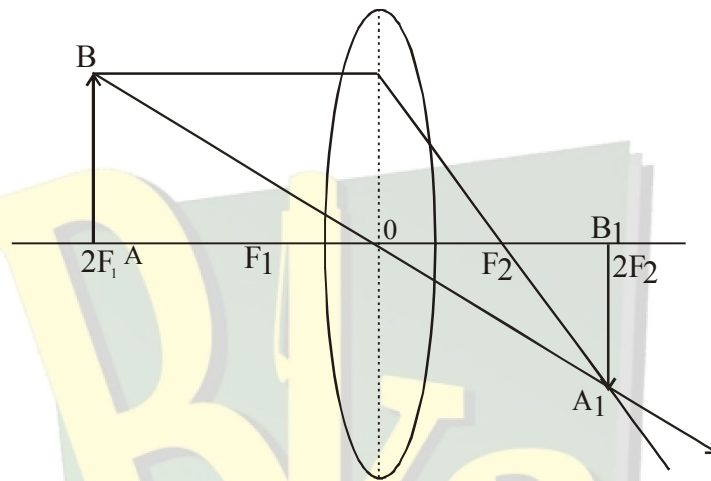


Fig. Real image formed by a convex lens

- 2) What is the Cartesian sign convention used for lens?

Ans. :

- i) The object is always placed on the left of the lens. All distances parallel to the principal axis are measured from the optical centre (O).
- ii) The distance measured to the right of O are taken to be positive while those measured to the left are taken to be negative.
- iii) Distances perpendicular to the principal axis & above it are taken to be positive.
- iv) Distances perpendicular to the principal axis & below it are taken to be negative.
- v) The focal length of a convex lens is positive while that of a concave lens is negative.

- 3) At what distance from a convex lens of focal length 2.5 m should a boy stand so that this image is half of his height?

Ans. : Given :

$$M = \frac{1}{2}, f = 2.5\text{m}$$

$$u = ?$$

$$M = \frac{v}{u}$$

$$\frac{1}{2} = \frac{v}{u}$$

$$v = \frac{u}{2}$$

$$\frac{1}{v} = \frac{2}{u}$$

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

for convex lens u is -ve

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

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

$$\frac{1}{f} = \frac{2}{v} + \frac{1}{u}$$

$$\frac{1}{f} = \frac{3}{u}$$

$$u = 3f$$

$$= 3 \times 2.5 = 7.5\text{m}$$

A boy should stand at a distance of 7.5m.

4) What is the function of iris and the muscles connected to the lens in the human eye?

Ans. : Function of iris :

- i) Iris is responsible for controlling the diameter and size of pupil.
- ii) Pupil controls the amount of light entering the retina.

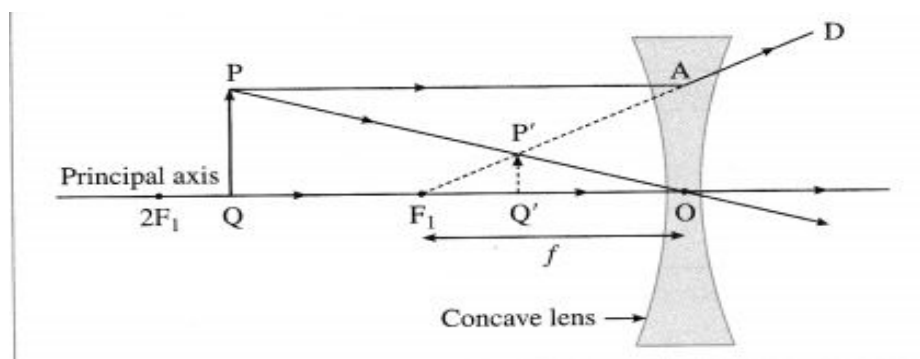
Function of ciliary muscle :

- i) Ciliary muscle is a circular muscles that contracts or relaxes to enable the lens to change the shape for focussing.
- ii) When we see distant objects the lens become flat because the ciliary muscles relax and focal length of lens increases.
- iii) When we see nearby objects the lens become rounded because the ciliary muscles tightens and the focal length of the lens decreases.

Q. 4: Solve the following question. (Any One)

5

1) Observe the following diagram and answer the following question



i) Write the position of the object.

Ans: The position of the object is at PQ.

ii) Write the position of the image.

Ans: The position of the image is at P'Q'.

iii) What is the nature of the image?

Ans: The nature of the image is virtual and erect.

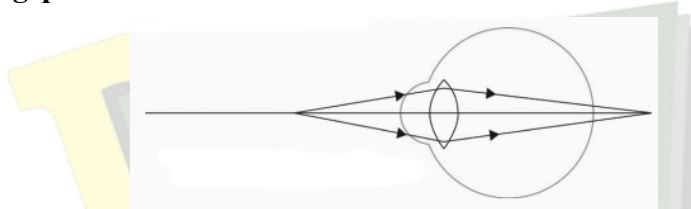
iv) What is the size of the image?

Ans: The size of the image is smaller than the object.

v) what is the sign of focal length in concave lens?

Ans: The focal length of a concave lens is negative.

2) Given below is diagram showing a defect of human eye. study it and answer the following question.

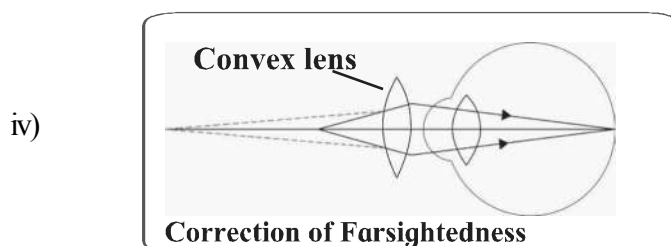


- i) Name and define the defect shown in fig.
- ii) Give two possible reason for this defect of eye in human being.
- iii) Name the type of lens used to correct the defect
- iv) Draw a well labelled diagram to show how the defect is rectified by using the lens.

Ans. : i) The defect shown in the figure is hyper metropia.

Hyper metropia : The defect in which the human eye can see distant object clearly but cannot see nearby object distantly is called as hypermetropia.

- ii) a) Curvature of the cornea and the eye lens decreases so the converging power of lens becomes less.
- b) Due to flattening of eye ball the distance between lens and retina decreases.
- iii) It is corrected using convex lens of suitable focal length.





B.KUMAR'S ACADEMY

Subject : Science -I
Class : X

Answer Paper **Topic : 8. Metallurgy**

Marks : 20

Q.1: A) Choose the correct alternative :

2

1) The earthy impurities associated with mineral used in metallurgy are called

Ans: c) Gangue

2) A process employed for the concentration of sulphide ore is

Ans: b) Roasting

B) Solve the following questions. (Any One)

1

1) Write name and molecular formula of the common ore of aluminium.

Ans: Bauxite, Molecular formula ($\text{Al}_2\text{O}_3 \cdot n\text{H}_2\text{O}$)

2) Give correlation.

Bronze : Copper and Tin :: Stainless steel : _____

Ans: Bronze : Copper and Tin :: Stainless steel : **Iron, Chromium and Carbon**

3) State true or false.

The melting and boiling points of ionic compounds are low.

Ans: False

Q.2: A) Give scientific reason. (Any One)

2

1) Cryolite is added to alumina in the electrolysis.

Ans: i) Melting point of alumina is greater than 2000°C

ii) Cryolite has less melting point. So to reduce the temperature of the fusion mixture from 2000°C to 1000°C by saving electrical energy.

iii) They also increase the conductivity and mobility of the fused mixture. Hence cryolite is added to alumina in the electrolysis.

2) Calcium floats over water during the reaction with water.

Ans: i) Calcium reacts with water less vigorously hence the heat evolved is not sufficient for hydrogen to catch fire.

ii) During the reaction bubbles of hydrogen released forms and stick to the surface of the calcium metal so calcium floats over water during the reaction with water.

B) Solve the following question. (Any Two)

4

1) State four properties of ionic compounds.

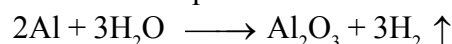
Ans: i) The ionic compounds exist in solid state and are hard.

ii) Ionic compounds are brittle and broken into pieces by applying pressure.

- iii) The melting point and boiling points of ionic compounds are high.
- iv) Ionic compounds are water soluble and are insoluble in solvent like kerosene and petrol.

2) Write and explain the reaction when steam is passed over aluminium.

Ans: When steam is passed over aluminium hydrogen gas is evolved and aluminium oxide is formed.



3) Define : i) Calcination ii) Galvanising

Ans: i) Calcination : Carbonate ores are strongly heated in a limited supply of air to convert them into oxides this process is called calcination.

ii) Galvanising : The process of giving a thin coating of zinc on iron or steel to protect them from corrosion called galvanizing.

4) Why sodium is always kept in Kerosene?

Ans: i) Sodium is highly reactive metal.

ii) Sodium reacts so vigorously with atmospheric oxygen that it catches fire. If it kept open in atmosphere.

iii) Sodium does not react with kerosene it sinks in it. Hence to protect sodium and to prevent accidental fires it is stored in kerosene.

Q.3: Solve the following questions. (Any Two)

6

1) Divide the metals Cu, Zn, Ca, Mg, Fe, Na, Li into three groups namely reactive metals, moderately reactive metals and less reactive metals.

Ans: Reactive metals - Na, Mg, Li

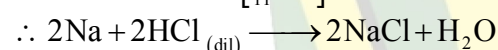
Moderately reactive metals $\rightarrow$ Fe, Ca

Less reactive metals $\rightarrow$ Zn, Cu

2) The electronic configuration of metal 'A' is 2, 8, 1 that of metal 'B' is 2, 8, 2 which of the two metals is more reactive? write their reaction with dilute hydrochloric acid.

Ans: The metal A with electronic configuration [2, 8, 1] is more reactive than metal B

Metal A is sodium $[_{11}\text{Na}]$

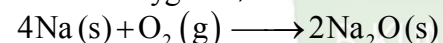


3) Explain any three chemical properties of metals with examples and reaction.

Ans: i) Reaction of metals with oxygen -

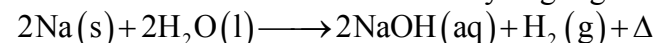
Metal combines with oxygen on heating in air and metal oxides are formed.

Metal + Oxygen $\rightarrow$ metallic oxide



ii) Reaction of metals with water.

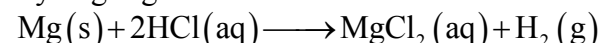
When metal reacts with water then the hydrogen gas is released.



iii) Reaction of metals with acids.

When the metal reacts with acid then salts of metal are formed and

hydrogen gas is released.



4) Explain Corrosion of metals and methods of preventing corrosion.

Ans: The rusting of iron on coming in contact with water and oxygen is called as corrosion.

Methods of preventing corrosion :

i) Galvanizing : In this method a thin layer of zinc is applied on iron or steel.

ii) Tinning : A molten layer of tin is deposited on metals.

iii) **Anodization** : Metals like aluminium copper are coated with a thin & strong layer of their oxides by means of electrolysis.

iv) **Electroplating** : In this method a less reactive metal is coated on a more reactive metal by electrolysis.

v) **Alloying** : The homogeneous mixture formed by mixing a metal with other metals or non metals in certain proportion is called alloy.

Q.4: Solve the following questions. (Any One)

5

1) Answer the following question with reference to diagram.

i) Which machine is used in the magnetic separation method?

Ans: An electromagnetic machine is used for magnetic separation method.

ii) Name the two parts of electromagnetic machine.

Ans: Main parts of electromagnetic machine are

- a) Two type of iron roller
- b) The conveyor belt moving continuously around them.

iii) Name the magnetic and nonmagnetic ingredients of tin ore.

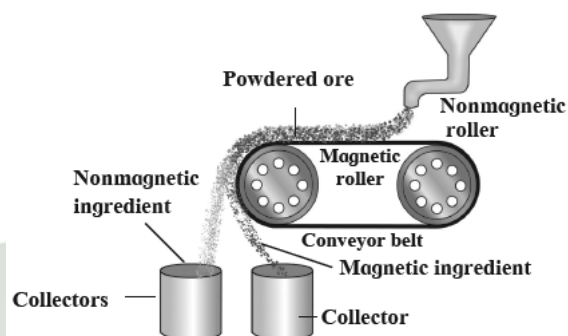
Ans: The magnetic ingredients are-ferrous tungstate.
The non magnetic ingredients are stannic oxide (SnO_2).

iv) From which conveyor belt is made up of ?

Ans: The conveyor belt is made up of leather or brass.

v) Name of ore of tin.

Ans: Cassiterite is the ore of tin.



2) Answer the following question with reference to diagram.

i) Which process of extraction shown in figure?

Ans: Figure shows extraction of aluminium by electrolytic reduction of alumina.

ii) Write cathode reaction.

Ans: $\text{Al}^{3+} + 3\text{e}^- \longrightarrow \text{Al}$. (Reduction)

iii) Why cryolite is mixed with molten alumina?

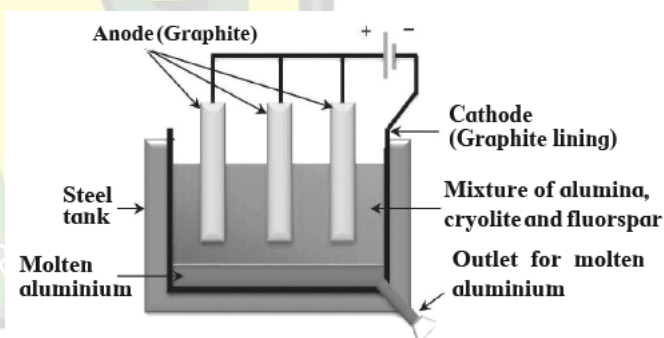
Ans: Cryolite is added to the molten mixture of alumina to reduce the melting point from 2000°C to 1000°C .

iv) Write the molecular formula of cryolite and fluorspar.

Ans: The molecular formula of cryolite is $(\text{Na}_3\text{AlF}_6)$, molecular formula of fluorspar CaF_2 .

v) Which gas is liberated at anode?

Ans: Oxygen gas is liberated at anode.



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B.K. KUMAR'S ACADEMY

Subject : Science -I
Class : X

Answer Paper 9. Carbon Compounds

Marks : 20

Q.1: A) Choose the correct alternative :

2

1) The first compound to be prepared in the laboratory was -----

Ans: d) Urea.

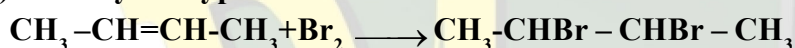
2) The number of C-H bonds in ethane C_2H_6 molecule are -----

Ans: b) 6

B) Solve the following questions. (Any One)

1

1) Identify the type of reaction :



Ans: Addition reaction

2) Write the structural formula for : 1 – bromopropane.

Ans: $CH_3-CH_2-CH_2-Br$

3) Find the odd one out : Polysaccharide, Teflon, Polyvinylchloride, PET.

Ans: PET (other are homopolymers)

Q.2: A) Give scientific reason. (Any One)

2

1) Iodine test is used for detection of a multiple bond in a carbon compound.

Ans: When a carbon compound combines with another compound to form a product that contains all the atoms in both the reactants it is called an addition reaction.

The addition reaction of an unsaturated compound with iodine takes place instantaneously at room temperature. The colour change can be felt by eyes. Therefore iodine test is used as a test for detection of a multiple bond in a carbon compound.

2) In hydrogenation of vegetable oil nickel catalyst is used.

Ans: The unsaturated compound can undergo addition reaction with hydrogen to form saturated compound. In presence of nickel catalyst.

The molecules of vegetable oil contain long and unsaturated carbon chains. Hydrogenation transforms them into saturated chains and thereby vanaspathi is formed.

B) Solve the following question (Any Two)

4

1) What causes the existence of a very large number of carbon compounds?

Ans: Carbon has a unique ability to form strong covalent bonds with other carbon atoms to form big molecules. This causes the existence of a very large number of carbon compounds.

2) Define structural isomerism.

Ans: The phenomenon in which compounds having different structural formulae have the same molecular formula is called structural isomerism.

The number of carbon compounds increases due to isomerism.

3) Saturated hydrocarbons are classified into three types. Write these names by giving one example each.

Ans: Saturated hydrocarbons are classified into 3 types as :

i) Straight chain hydrocarbon : Butane $\text{—CH}_3\text{—CH}_2\text{—CH}_2\text{—CH}_3$

ii) Branched chain hydrocarbon : 2 methyl propane $\text{CH}_3 - \text{CH} - \text{CH}_3$
 $\quad \quad \quad |$
 $\quad \quad \quad \text{CH}_3$

iii) Rings of hydrocarbon : Cyclobutane

$$\begin{array}{c} \text{CH}_3 - \text{CH}_2 \\ | \quad | \\ \text{CH}_2 - \text{CH}_2 \end{array}$$

4) Draw the structural formula for the followig IUPAC name.

(i) 2 bromo-butene (ii) Butanoic acid

Ans: i) $\text{CH}_3 - \underset{\text{Br}}{\text{C}} = \text{CH} - \text{CH}_3$ ii) $\text{CH}_3 - \text{CH}_2 = \text{CH}_2 - \text{COOH}$

Q.3: Answer the following questions (Any Two)

6

1) Write the difference between saturated hydrocarbon and unsaturated hydrocarbon.

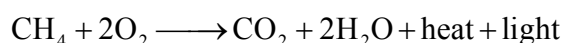
Ans:

Saturated hydrocarbon	Unsaturated hydrocarbon
1) They contain only single bond between two carbon atoms (C–C)	1) They contain double or triple bond between two carbon atom (C=C) or (C $\equiv$ C)
2) They are chemically less reactive	2) They are chemically more reactive.
3) The general formulae C _n H _{2n+2}	3) The general formula is C _n H _{2n-2}
4) Substitution reaction is characteristic property of saturated hydrocarbon	4) Addition reaction is characteristic property of unsaturated compound
5) Saturated hydrocarbons burns with clean blue flame	5) Unsaturated compounds burns with yellow flame
6) Example - Methane Ethyne H – C $\equiv$ C – H	6) Example - Ethane – CH ₂ = CH ₂

2) What is combustion of carbon compounds? Explain with example.

Ans: The burning of carbon compounds in presence of oxygen to emit heat & light to form carbon dioxide & water is called combustion of carbon compounds.

For eg: methane burns to give carbon dioxide & water



3) What is meant by vinegar and gasohol? What are their uses?

Ans: Vinegar is a sour tasting liquid. It is 5-8% aqueous solution of acetic acid.

- 1) Vinegar contains acetic acid, water and other trace chemical.
- 2) Vinegar is made through the formation of ethanol by acetic acid bacteria.

Uses of vinegar :

- i) Used as a cooking ingredient.
- ii) Used as a preservative in pickles.

Gasohol :

It is a mixture of gasoline and ethyl alcohol. It is a mixture of nine parts of unleaded gasoline by volume with one part of ethanol ethylalcohol.

Uses of gasohol :

i) Gasohol is used as an additive to increase the efficiency of petrol.

- ii) A mixture of 80% to 90% petrol with 20% or 10% ethyl alcohol used as a fuel in internal combustion engines.
- iii) Used as a fuel in motor.
- iv) In motor fuel contains 90% gasoline and 10% ethanol.

4) Write the IUPAC names of the following structural formulae.

Ans: i) $\text{CH}_3 - \underset{\text{Br}}{\text{CH}} - \text{CH}_3$ - 2-Bromopropane

ii) $\text{CH}_3 - \text{CO} - \text{CH}_2 - \text{CH}_3$ - 2 Butanone

iii) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{OH}$ - Butane-1-ol

Q.4: Solve the following questions. (Any One)

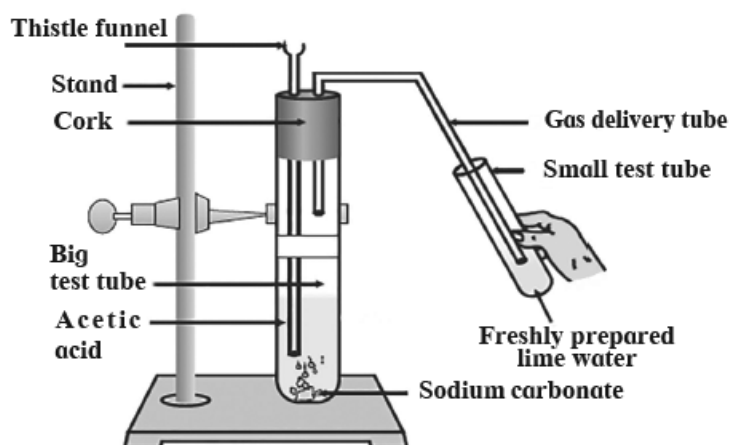
5

1) Consider the relation between Column I and II. Fill in Column IV to match Column III.

Column I	Column II	Column III	Column IV
(1) Ethylene	Polyethylene	Tetrafluoroethylene	_____
(2) Poly-propylene	Propylene	Polystyrene	_____
(3) Poly-saccharide	Glucose	Proteins	_____
(4) Rubber	Isoprene	D.N.A.	_____
(5) Wood	Cellulose	Chromosomes of plants	_____

Ans: (1) Teflon
(2) Styrene
(3) Alpha aminoacid
(4) Nucleotide
(5) R.N.A.

2) With referene to given diagram answer the following question.



i) Which gas does come out as effervescence in the big test tube?

Ans: CO₂ gas come out as effervescence in the bit test tube.

ii) Which reaction shown in the given diagram?

Ans: The given diagram shows the reaction of acetic acid and sodium carbonate.

iii) Why are bubbles seen in the small test tube?

Ans: CO₂ gas liberated from the reaction of acetic acid and sodium carbonate is delivered in small tube. So we see bubbles of CO₂ gas in small test tube.

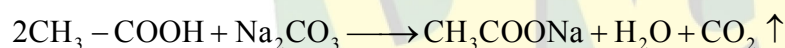
iv) What is the colour change in the lime water? Write the related equation.

Ans: On passing CO₂ gas lime water turns milky $\text{Ca(OH)}_2 + \text{CO}_2 \longrightarrow \text{CaCO}_3 + \text{H}_2\text{O}$

Due to formation of insoluble ppt of calcium carbonate lime water turns milky.

v) Write the balanced chemical reaction of acetic acid and sodium carbonate.

Ans: Ethanoic acid react with sodium carbonate to form a salt named sodium ethanoate water and carbon dioxide gas is liberated



* * *

B.KUMAR'S ACADEMY



B.K. KUMAR'S ACADEMY

Subject : Science -I
Class : X

Answer Paper **10. Space mission**

Marks : 20

Q.1: A) Choose the correct alternative :

2

1) The first person to go into the space in a spacecraft was

Ans: b) Yuri Gagarin

2) A group of students from COEP made a small satellite namely.

Ans: d) Swayam

B) Solve the following questions. (Any One)

1

1) Write true or false.

The escape velocity on moon is less than that on earth.

Ans: True

2) Name the first artificial satellite.

Ans: 'Sputnik' is the first artificial satellite.

3) Complete the analogy.

Ans: INSAT : Communication satellite :: IRS : Earth observational satellite

Q.2: A) Give scientific reason. (Any One)

2

1) Geosynchronous satellite appears to be stationary with respect to earth.

Ans: i) The earth takes almost 24 hrs for one rotation around itself.

ii) If a satellite is revolving in an orbit parallel to equator the time of rotation of earth around itself and that for satellite to revolve round the earth is same.

iii) Also the orbit of rotation is circular and its angular velocity is identical to that of earth.

iv) Also these satellite revolve in same direction as earth rotates i.e. from west to east.

v) Hence for an observer on the surface of the earth, the satellite appears to be stationary.

2) It is very essential to manage the space debris.

Ans: i) In addition to artificial satellite some objects like non functional satellite parts of launches detached and debris are generated due to collision of one satellite with other satellite or any other object in space.

ii) These objects revolve around the earth and can be harmful to artificial satellite.

iii) It can collide with artificial satellites or spacecrafts and damage them.

iv) These are increasing day by day and thus it will be difficult to launch new spacecrafts.

B) Solve the following question (Any Two)

4

1) What is the need of space mission?

Ans: We need space missions as we :

i) Can contact a person in any part of the world within a second.

ii) Can gather information about worldwide events sitting at home.

2) Why it is beneficial to use satellite launch vehicles made of more than one stage?

Ans: The vehicle has to carry a large weight of the fuel with it. To overcome this problem, launch vehicles with more than one stage are used. Due to this the weight of the vehicle can be reduced step by step after its launching therefore it is beneficial to use satellite launch vehicles made of more than one stage.

3) Write the difference between HEO and MEO

Ans:	HEO	MEO
	1) Height of satellite in HEO is greater than or equal to 35780 km. 2) These are not useful in study of polar region 3) These orbits complete one revolution in almost 24 hrs. 4) These satellite appears to be stationary and hence are called geosynchronous	1) Height of satellite in MEO is in between 2000 km and 35780 km 2) These are useful in study of polar regions. 3) These orbits complete one revolution in 2 to 24 hrs. 4) These satellites revolve with different velocities and hence do not appear stationary.

4) If mass of a planet is eight times the mass of the earth and its radius is twice the radius of the earth. What will be the escape velocity for that planet?

Ans: $M_p = 8 M_e$

$R_p = 2 R_e$

Vesc (Planet) = ?

$$V_{esc} = \sqrt{\frac{2GM}{R}}$$

$$(V_{esc})_p = \sqrt{\frac{2GM_p}{R_p}} = \sqrt{\frac{2G(8M_e)}{2(R_e)}} = \sqrt{\frac{8GM_e}{R_e}}$$

$$\frac{(V_{esc})_e}{(V_{esc})_p} = \frac{\sqrt{\frac{2GM_e}{R_e}}}{\sqrt{\frac{8GM_e}{R_e}}} = \frac{\sqrt{2}}{\sqrt{8}} = \frac{\sqrt{2}}{\sqrt{1 \times 4}}$$

$$\frac{(V_{esc})_e}{(V_{esc})_p} = \frac{1}{2}$$

Escape velocity of earth = 11.2 km/s

$$\frac{11.2}{(V_{esc})_p} = \frac{1}{2}$$

$$(V_{esc})_p = 2 \times 11.2 = 22.4 \text{ km/s}$$

$\therefore$ The escape velocity of planet is 22.4 km/s.

Q.3: Answer the following questions (Any Two)

6

1) Write a short note on India and space technology.

- Ans:** i) India has developed various types of launch vehicles to put satellites having weight upto 2500kg. into all types of orbits.
ii) PSLV & GSLV are two important launchers.
iii) INSAT & GSAT satellite series is actively working in the field of telecommunication, television broadcasting & meteorological services.

2) Explain mars missions in brief.

Ans: ISRO's performance in this mission is remarkable & we all must be proud of it.

The spacecraft 'Mangalyaan' made by ISRO using minimum expenses was launched in November, 2013 & was placed into orbit around the Mars in September, 2014. It Obtained very useful information about the space of the mars & the atmosphere around it

3) Why are geostationary satellites not useful for the studies of polar regions?

- Ans:** i) The geostationary satellites orbit the equator.
ii) These are, therefore, not useful in the study of polar regions.
iii) for this purpose, elliptical medium earth orbits passing over the polar region are used.

4) Derive the equation of critical velocity of a satellite. What do you conclude from the equation.

Ans: If a satellite of mass m is revolving around the earth in an orbit of height h with speed ' V_c ' then force acting on its centripetal force given by mv_c^2/r where r is the orbital radius of satellite from centre of earth. This centripetal force is provided by the gravity of the earth

∴ Centripetal force = gravitational force between earth and satellite

$$\frac{mv_c^2}{R+h} = \frac{GMm}{(R+h)^2}$$

$$mv_c^2 = \frac{GM}{R+h}$$

$$v_c = \sqrt{\frac{GM}{R+h}} \quad \text{..... (1)}$$

G = Gravitational constant

M = Mass of earth

R = Radius of earth

h = height of satellite above earth surface

$R+h$ = Radius of orbit of satellite

From equation (1) we conclude that the critical velocity does not depend on mass of satellite. As the height of satellites orbit from the earth's surface increases, the critical velocity decreases.

Q.4: Solve the following question (Any One)

5

1) Match the column:

Column A	Column B
(1) Clouds over India	(a) Low Earth Orbit
(2) Global communication	(b) PSLV
(3) Launch vehicle made by ISRO	(c) Communication satellite
(4) International Space Station	(d) EDUSAT
(5) Navigational satellite	(e) Weather satellite
	(f) Medium Earth Orbit

Ans:

- (1) Clouds over India – Weather satellite
- (2) Global communication – Communication satellite
- (3) Launch vehicle made by ISRO – PSLV
- (4) International Space Station – Low Earth Orbit
- (5) Navigational satellite – Medium Earth Orbit.

2) Complete the following table:

IRNSS		
	Weather study & predict	
		Earth's observation

Ans:

IRNSS	Navigational Satellite	To fix the location in terms of precise latitude and longitude
INSAT	Weather study and predict	Weather Satellite
IRS	Earth observation satellite	Earth's observation

* * *



B.K. KUMAR'S ACADEMY

Subject : Science-II
Class : X

ANSWERS PAPER 1. Heredity and Evolution

Total Marks : 20

Q. 1 A) Choose the correct alternative.

2

1) The process by which nucleotide in the gene suddenly changes its position called-----.

Ans : c) Mutation

2) ----- is not the vestigial organ in the human body.

Ans : c) Canine

Q. 1 B) Solve the following question. (Any One)

1

1) Identify the correlation between the first two words and suggest the suitable word in fourth

Survival of fittest : Darwin : : Acquired Character : -----.

Ans : Survival of fittest : Darwin : : Acquired Character : **Jean - Baptiste Lamarck** .

2) What is evolution?

Ans : Evolution is the gradual change occurring in living organisms over a long duration.

3) Which animal is called a connecting link between reptiles and mammals?

Ans : Peripatus is called a connecting link between reptiles and mammals.

Q. 2 A) Give scientific reason. (Any One)

2

1) Peripatus is said to be connecting link between Annelida and Arthropoda.

Ans : In peripatus characters like segmented body thin cuticle, and parapodia like organs are present. These characters are shown in annelida.

Similarly Peripatus show tracheal respiration and open circulatory system similar to arthropodas. Therefore peripatus is said to be connecting link between annelida and arthropoda.

2) Natural selection plays important role in survival.

Ans : Natural selection plays important role because nature selects only those organisms which are fit to live and the rest perish. Sustaining and selected organisms can perform reproduction and thereby give rise to the new species with their own specific characters.

Q. 2 B) Solve the following question. (Any Two)

4

1) What is embryological and anatomical evidences.

Ans : 1) Embryological evidences :

- 1) Comparative study of embryonic developmental stages of various vertebrates show that all embryos show extreme similarities during initial stages and those similarities decrease gradually.
- 2) Similarities in initial stages indicate the common origin of all the animals.

Anatomical Evidences :

- 1) There is similarity in structure of bones and bony joints in organs of each animals.
- 2) This similarity indicates that animals may have common ancestor.

2) Explain the theory of evolution.

Ans : Theory of Evolution.

- 1) According to theory of evolution (protoplasm) has been formed in ocean.
- 2) In due course of time, unicellular organism was formed.
- 3) Gradually, change occurred in the unicellular organism from which larger and more complex organisms were formed.
- 4) All those changes were slow and gradual.
- 5) Duration of all these changes is at the most 300 Crore years.
- 6) Changes and development in living organisms had been all round and multi-dimensional and this led to evolution of different types of organisms.
- 7) Hence, this overall process is called as evolution which is organizational.
- 8) Progressive development of plants and animals from the ancestors having different structural and functional organization is called evolution.

3) What is the use of science of heredity?

Ans : The science of heredity is useful for diagnosis, treatment and prevention of hereditary disorders, production of hybrid varieties of animals and plants and in industrial processes in which microbes are used.

4) Explain with suitable examples importance of anatomical evidences in evolution.

- Ans :**
- i) Anatomical evidences can be obtained by comparative anatomy studies which is the study of similarities and differences in the anatomy of different species.
 - ii) Anatomical evidences can be used to trace back common ancestry.
 - iii) Example - Human hands, cats foreleg, patagium of bat, flipper of whale look different on a superficial level and also have different functions. But there are similarities in the bones and bony joints in the organs to those animals.

Q.3 Solve the following question. (Any Two)

6

1) What is carbon dating?

Ans : Carbon dating :

- 1) Carbon dating method is based upon the radioactive decay of naturally occurring C-14 and it is developed by Willard Libby.
- 2) Carbon consumption of animals and plants stop after death and since then, only the decaying process of C-14 occurs continuously.

- 3) In case of dead bodies of plants and animals, instead of remaining constant, the ratio between C-14, and C-12 is non – radioactive.
- 4) The time passed since the death of a plant or animal can be calculated by measuring the radioactivity of C-14, and ratio of C -14 to C-12 present in their body.
- 5) This is carbon dating method.

2) Explain Darwin's theory of natural selection.

Ans : Darwin's theory of natural selection

- 1) Charles Darwin had collected innumerable specimens of plants and animals and depending upon the observations of those specimens, he published the theory of natural selection which preaches the survival of fittest.
- 2) For this purpose, Darwin had published a book titled 'Origin of species'.
- 3) While explaining the concept, Darwin says that all the organisms reproduce prolifically.
- 4) All the organisms compete with each other in a life threatening manner.
- 5) In this competition, only those organisms sustain which shows the modification essential for winning the competitions.
- 6) However, besides this, natural selection also plays important role because nature selects only those organisms which are fit to live and the rest perish.
- 7) Sustaining and selected organisms can perform reproduction and thereby give rise to the new species with their own specific characters.
- 8) Darwin's theory of natural selection was widely accepted for long duration.

3) Write four difference between Transcription and Translation.

Ans :	Transcription	Translation
	1) It is the process of synthesis of RNA from DNA.	1) It is the process of synthesis of protein from RNA
	2) This process occurs in the nucleus.	2) This process occurs in the cytoplasm.
	3) A chain of nucleotides is produced.	3) A chain of amino acid specified by the mRNA sequence is produce.
	4) Nucleotides are bonded by phosphodisetter	4) Amino acid are bonded by peptide bond.

4) Define fossil. Explain importance of fossils as proof of evolution.

Ans : Fossils :

Large number of organisms get buried due to disasters like flood, earthquake volcano etc. Remnants and impressions of such organisms remain preserved underground. These are called as fossils.

Importance of fossils as proof of evolution :

Carbon consumption of animals and plants stops after death and since then only the decaying process of C-14 occurs continuously.

The carbon dating method is used in paleontology and anthrology for determining the age of human fossils and manuscripts. Once the age of fossil been determined by such technique, it

becomes easy to deduce the information about other organism. It seems that vertebrates have been slowly originated from invertebrates.

Q. 4 : Solve the following question. (Any One).

5

1) Read the paragraph and answer the questions given below:

With the help of RNA,..... is called 'transcription'.

a) Which part of the cell control the structure and functioning of the body?

Ans: Genes present in the form of DNA along with RNA control the structure and functioning of the body.

b) How is a specific protein synthesised in the cell?

Ans: The information of protein synthesis is stored in the DNA which is utilised as per the requirement of the body. Later the proteins are synthesised by DNA through the RNA.

c) What is the similarity between mRNA and DNA?

Ans: The sequence of nucleotides on DNA is copied on mRNA. The nucleotide sequence on mRNA is thus complementary to DNA.

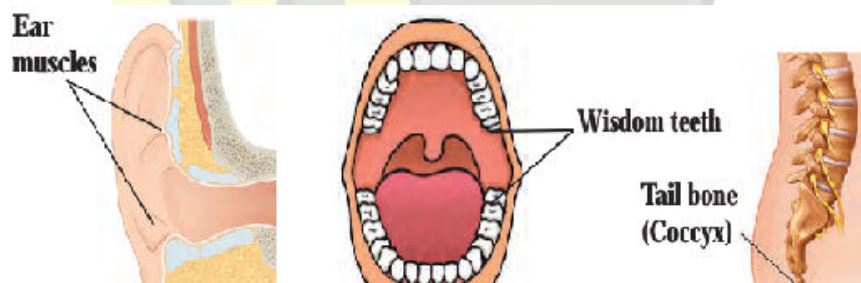
d) Give one difference between RNA and DNA.

Ans: RNA has uracil instead of thymine which is present in DNA.

e) Define central dogma.

Ans: Central dogma is the concept that proteins are synthesised by DNA through the RNA.

2) Observe the following question and answer the following question



a) Identify the organ which is shown in the figure.

1

b) Write the definition of the organ which is identified in question (a)

2

c) Write names of some vestigial organs in human body and write the names of those animals in whom same organs are functional.

2

Ans : a) The organ which is shown in the figure are vestigial organ

b) Degenerated or under developed organs of organisms are called as vestigial organs.

c) Appendix which is useless to human is useful and fully functional organ in ruminants. Similarly muscles of ear pinna which are useless to human are useful in monkeys for movement of ear pinna.

Various vestigial organs like tail bone (coccyx), wisdom teeth and body hairs are present in body of human being.



B.K.KUMAR'S ACADEMY

Subject : Science-II

ANSWERS PAPER

Total Marks : 20

Class : X

2. Life processes in living organisms part – 1

Q. 1 A) Choose the correct alternative.

2

1) Which one of the following vitamins is necessary any for the synthesis of NADH_2 ?

Ans : b) Vitamin B₅

2) Somatic and stem cells undergo ----- type of division.

Ans : b) mitosis

Q. 1 B) Solve the following question (Any One)

1

1) Write name of the following

i) NADH_2 ii) FADH_2

Ans : i) NADH_2 - Nicotinamide Adenine dinucleotide

ii) FADH_2 - Flavin adenine dinucleotide

2) Find the odd man out

TCA cycle, citric acid cycle, kreb cycle, EMP pathway.

Ans : EMP pathway

3) Write about vitamins.

Ans : 1) Vitamins are a group of heterogeneous compounds of which each is essential for proper operations of various processes in the body.

2) There are main six types of vitamins, eg. A, B, C, D, E and K.

3) Out of these A, D, E and K are fat soluble whereas B and C are water soluble.

Q. 2 A) Give scientific reason. (Any One)

2

1) Fibers are one of the important nutrients.

Ans : Fibers are one of the important nutrient because fiber help in the digestion of other substances and egestion of undigested substances. Fibre obtain from leafy vegetables, fruits, cereals etc.

2) Kreb's cycle is also known as citric acid cycle.

Ans : 1) Kerb cycle is a cyclic series of reaction operated in mitochondtia in order for completion of oxidation of glucoses. 2) Acetyl CoA obtained from pyruvic acid is first converted to citric acid as it enters the kreb's cycle 3) Since kreb's cycle is cyclic chain of reactions the initial citric acid keeps on getting generated after completetion of every round of the cycle. 4) Since cycle starts and ends in generation of kreb's cycle is also known as citric acid cyle.

Q.2 B) Solve the following question. (Any Two)

4

1) **Define - Anaerobic respiration. Give two examples of anaerobic respiration.**

Ans : **Anaerobic respiration :** The respiration which occurs in absence of oxygen is called as anaerobic respiration.

Example : 1) Seeds perform anaerobic respiration if the soil is submerged under water during germination. 2) Our muscle cells also perform anaerobic respiration while performing the exercise.

2) **Distinguish between Glycolysis and TCA cycle.**

Ans :	Glycolysis	TCA cycle
	1) Process of glycolysis occurs in cytoplasm.	1) Cyclic chain of reactions called as tricarboxylic acid is operated on it in the mitochondria.
	2) A molecule of glucose Step in this process and two molecules of each i.e. pyruvic acid, ATP, NADH ₂ and water are formed.	2) Both molecules of acetyl – co A enter the mitochondria.
	3) Molecules of pyruvic acid formed in this process are converted into molecules of Acetyl coenzyme – A.	3) Acetyl's part of acetyl co-A is completely oxidized through this cyclical.
	4) Two molecules of NADH ₂ and two molecules of CO ₂ are released during this process.	4) Process and molecules CO ₂ , H ₂ O, NADH ₂ , FADH ₂ are derived.

3) **Explain water is an essential nutrient.**

Ans : 1) There is about 65-70% water in our body.
2) Each cell contains 70% water by weight.
3) Blood plasma also contains 90% of water.
4) Functioning of cells and thereby whole body disturbs even if there is a little loss of water from the body.
5) Hence, water is an essential nutrient.

4) **Explain the glycolysis in detail.**

Ans : **Glycolysis :** Process of glycolysis occurs in cytoplasm. A molecule of glucose is oxidised step by step in this process and two molecules of each i.e. pyruvic acid, ATP, NADH₂ and water are formed.

Molecules of pyruvic acid formed in this process are converted into molecules of NADH₂ and two molecules of CO₂ are released during this process.

Q.3 Solve the following question. (Any Two)

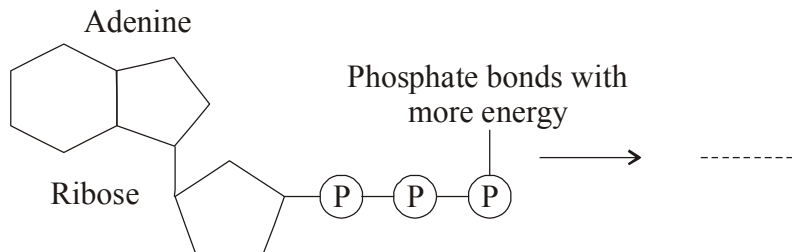
6

1) **Write a note on proteins and different amino acids obtained.**

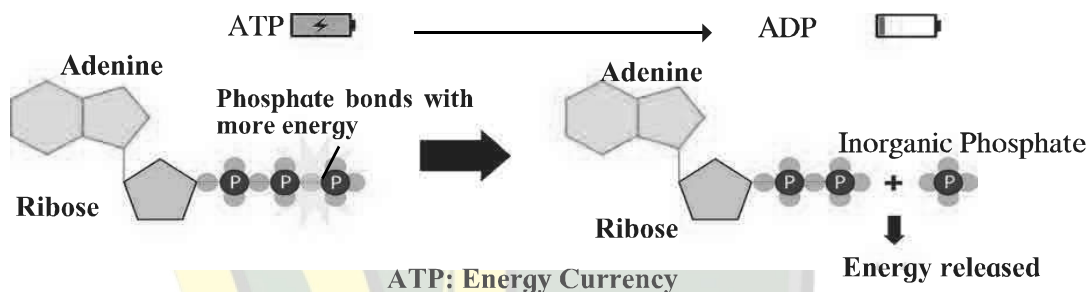
Ans : 1) Proteins are the macromolecules formed by bonding together many amino acids.
2) Proteins of animal origin are called as 'first class' proteins.
3) We get 4 kcal of energy per gram of proteins.

- 4) Amino acids are obtained after digestion of proteins.
- 5) Those amino acids are absorbed in the body and transported up to each organ and cell via blood.
- 6) From these amino acids, organs & cells produce various proteins necessary for themselves & the whole body.

2) Complete the following figure.



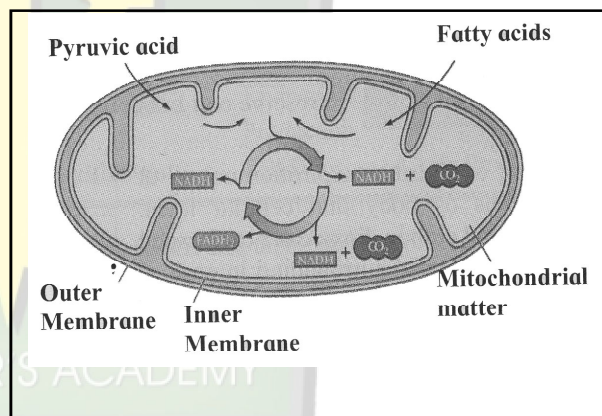
Ans :



3) Draw the diagram.

Mitochondria and tricarboxylic acid cycle.

Ans :



4) How all the life processes contribute to the growth and development of the body?

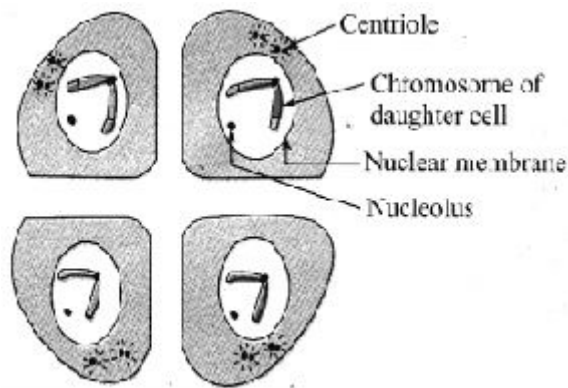
- Ans :**
- 1) There are different processes that occur at the body and cellular level in any organism
 - 2) Body function are the physiological or psychological function of body system and the body's function are ultimately it's cell's function.
 - 3) Survival and growth is body's most important business and in that process all the physiological functioning occurring in the body work in coordination to maintain homeostasis of body.
 - 4) Body organization of any organism is such that there is division of labor and each component has its own job to perform while coordinating with other system.
 - 5) For example : Nutrients taken by organism processed by digestive system to give energy to all other system. This energy is produced by mitochondria, circulatory system make sure that these nutrient reach to all the cell of the body. The cell division process ensures that the cells are regenerated.

Thus all the example show how every cell functions in an attempt to maintain homeostasis and the end result of which is survival, growth and development.

Q. 4 : Solve the following question. (Any One)

5

1) Observe the figure and answer the following question



a) Identify the figure.

Ans: The above figure shows Telophase-II

b) In which cell the meiosis occur?

Ans: The meiosis occur in germ cell.

c) How many daughter cells are seen?

Ans: Four daughter cells are seen.

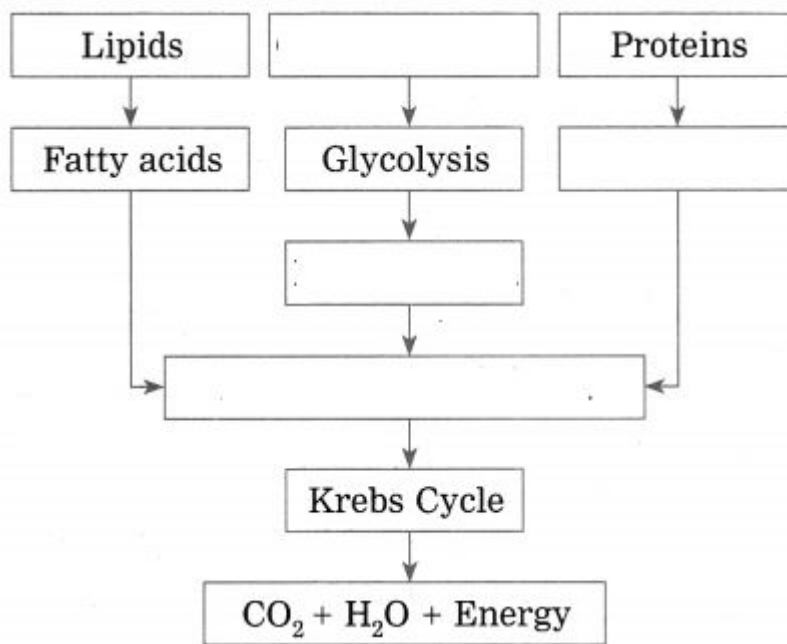
d) Haploid or diploid chromosomes are seen in the figure?

Ans: Diploid chromosomes are seen in the figure

e) Is this figure is of meiosis I or meiosis II?

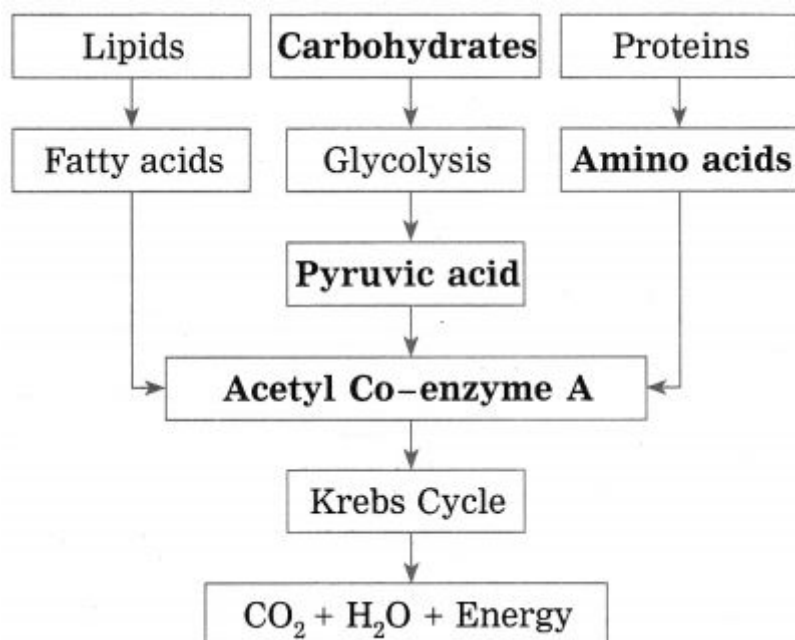
Ans: This figure is of meiosis II.

2) Complete the following chart and state which process of energy production it represents:



Ans:

The chart shows process of energy production through aerobic respiration of carbohydrates, proteins and fats.





B.KUMAR'S ACADEMY

Subject : Science-II
Class : X

ANSWERS PAPER 3. Life process in living organisms (Part – 2)

Total Marks : 20

Q. 1 A) Choose the correct alternative.

2

- 1) **Vegetative propagation in potatoes is preformed with the help of ----- present on tuber.**

Ans : a) Eyes

- 2) **Sperms and oocytes are produced by -----.**

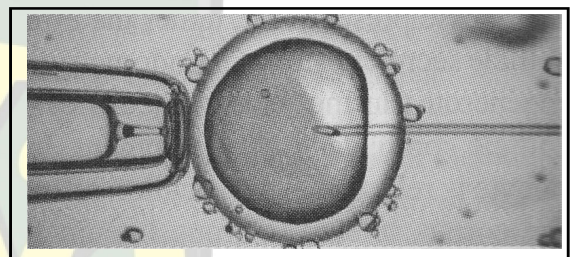
Ans : b) Meiosis

Q. 1 B) Solve the following question. (Any One)

1

- 1) **What is vitrofertilization?**

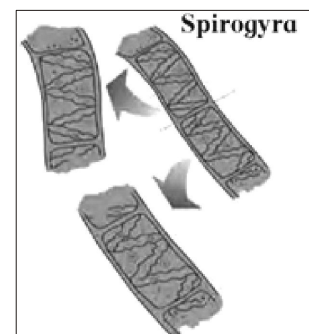
Ans : i) In this technique, fertilization is brought about in the test tube and the embryo formed is implanted in uterus of woman at appropriate time.



Fertilization in a test tube

- ii) IVF technique is used for having the child in case of those childless couples who have, problems like less sperm count, obstacles in oviduct etc.

- 2) **What is the type of asexual reproduction shown in the diagram below?**



Ans : Fragmentation type of asexual reproduction occurs in the above figure.

- 3) **Find out the correlation**

FSH : Development of oocytes :: LH : -----

Ans : FSH : Development of oocytes :: LH : oocyte is released

Q. 2 A) Give scientific reason. (Any One)

2

- 1) **Flower is the structural unit of sexual reproduction in plant.**

Ans : Flower is structural unit of sexual reproduction in plants because the androecium and gynoecium these whorls perform the function of reproduction is present in the flower.

Androecium is a male whorl and gynoecium is a female whorl. When the male gamete from the androecium fuses with female gamete from the gynoecium then the fertilization takes place.

2) In sexual reproduction newborn show similarities about characters.

Ans : Two parents i.e. male parent and female parent are involved in this type of reproduction. Fusion of male gamete of male parent and female gamete of female parent occurs.

Due to this new individual always has the recombined genes of both the parents. Hence the newborn shows similarities with the parents for some characters and has some characters different than both parents.

Q. 2 B) Solve the following question. (Any Two)

4

1) What is asexual reproduction? Write one good and one bad point about it.

Ans : Asexual reproduction :

- 1) Process of formation of new organism of same species without involvement of gametes is called as asexual reproduction.
- 2) Absence of genetic recombination is a drawback whereas fast process is advantage of this reproductive method.

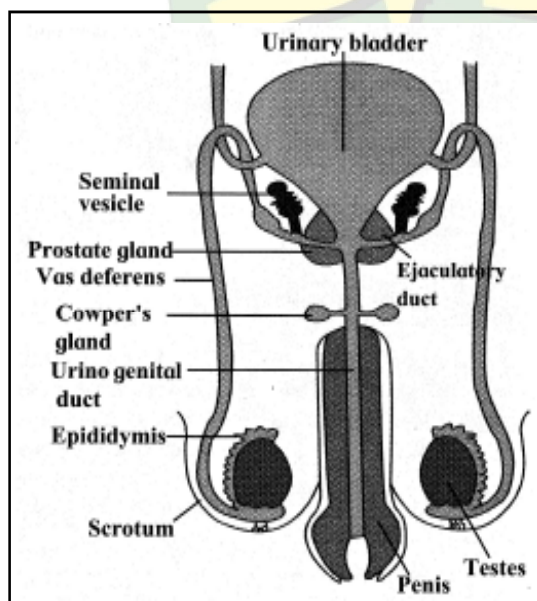
2) Is it right to consider the mother responsible for a girl child? Explain.

Ans : 1) No.

- 2) The man is totally responsible, whether the couple will have a boy or a girl child.
- 3) During Zygote formation man contributes either X or Y chromosome to the next generation.
- 4) But females transfer only X sex chromosome to the next generation.
- 5) At the time of fertilization if X chromosomes comes from male, the child will be a girl and if Y – chromosome comes then the child will be a boy.
- 6) Thinking of this, it is not right to consider the mother responsible for a girl child.
- 7) We all must take efforts to stop female foeticide.

3) Draw the diagram of male reproductive system of human.

Ans :



4) Write the difference between sexual and asexual reproduction.

Ans :	Asexual reproduction	Sexual reproduction
	1) Reproduction that occurs with the help of somatic cells is called as asexual reproduction.	1) Reproduction that occurs with the help of germ cells is called as sexual reproduction.
	2) Only one parent is involved.	2) Both male and female parent are involved.
	3) This reproduction occurs with help of mitosis only.	3) This reproduction occurs with the help of meiosis and mitosis.
	4) New individual formed by this method is genetically similar to the parents.	4) New individual formed by this method is genetically different from parents.

Q.3 Solve the following question. (Any Two)

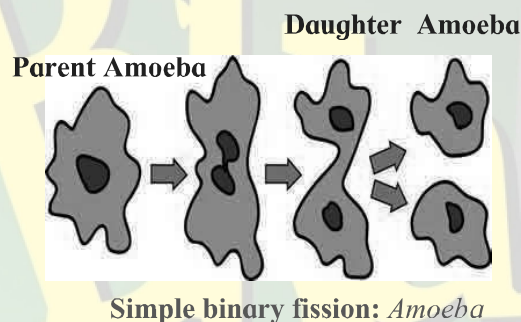
6

1) Explain the terms related to reproduction in amoeba (a) Binary fission (b) Multiple fission

Ans : a) Binary fission : In this binary fission, the parent cell divides to form two similar daughter cells. Binary fission occurs either by mitosis or amitosis.

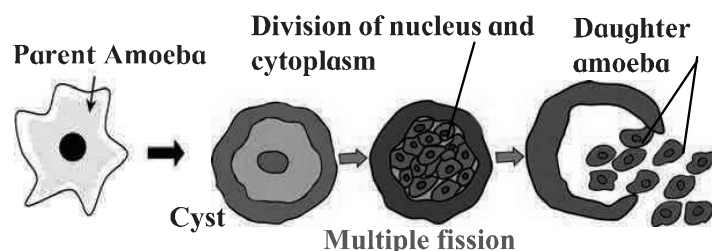
Amoeba divides in any plane due to lack of specific shape hence it is called as simple binary fission.

Binary fission is usually formed by living organisms during favorable conditions.



b) Multiple fission : Multiple fission is performed by amoeba. Amoeba stops the formation of pseudopodia and thereby movement whenever there is lack of food or any other type of adverse condition. It becomes rounded and forms protective covering around plasma membrane such encysted amoeba is called as cyst.

Many nuclei are formed by repeated nuclear division in the cyst. It is followed by cytoplasmic division and thus many amoebulae are formed on arrival of favorable conditions cyst breaks and many amoebulae are released.



2) Write the names of any three organs of female reproductive system of human and give their functions.

Ans : Organs of female reproductive system are

- i) Oviduct
- ii) Ovary
- iii) uterus

Function :

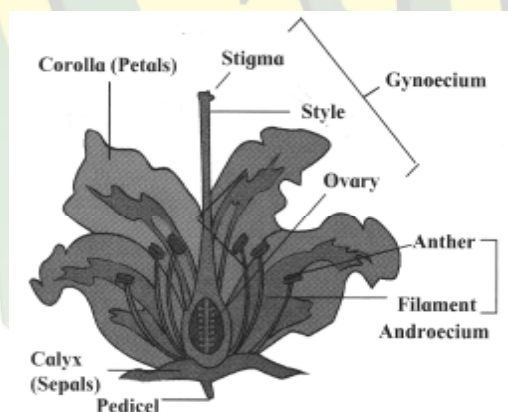
- i) **Oviduct :** Ovum is released from ovary. Oocyte enters the oviduct through the opening cilia are present on inner surface of oviduct. These cilia push the oocyte towards uterus.
- ii) **Ovary :** Ovum is released from ovary.
- iii) **Uterus :** Embryo is implanted and further development occurs after implantation in the uterus.

3) Explain sexual reproduction in plant.

Ans : Units of reproduction in plants is flower. It has 4 whorls 2 essential whorls and 2 non essential whorls. Essential whorls are androecium and gynoecium and perform function of reproduction. Androecium is a male whorl and gynoecium is a female whorl.

Ovary is present at the basal end of carpel style arises from ovary and sticky stigma is present at the tip of style ovary contains ovule.

Pollen grain from anther are transferred to stigma and from them pollen tube germinates and grows towards ovary. Male gametes are released inside the ovary and 2 male gametes are released. One gamete fuses with the egg to form zygote and second male gamete unites with polar nuclei to form endosperm.



4) Which precautions will you follow to maintain the reproductive health?

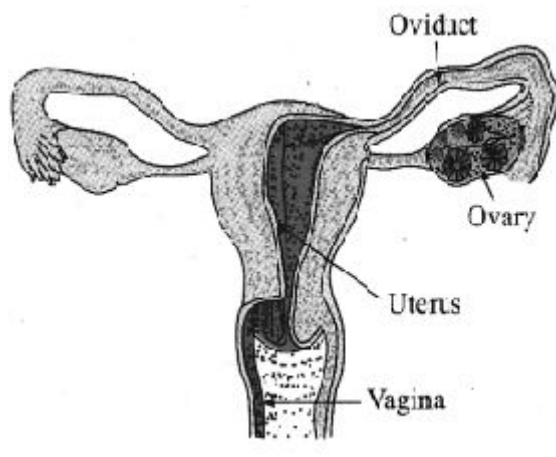
- Ans :**
- i) Bleeding occurs during menstrual cycle due to this genitals need to be maintained clean time to time.
 - ii) Reproductive health may arise in men too. It is essential to maintain cleanliness of their genitals.
 - iii) Eat a balanced diet.
 - iv) Drink plenty of water
 - v) Get regular exercise

- vi) Maintain healthy weight
- vii) Get enough sleep
- viii) Avoid smoking and drinking alcohol
- ix) Manage stress in healthy ways.

Q. 4 : Solve the following question. (Any One)

5

1)Observe the figure and answer the questions below:



a) What does the figure indicate?

Ans: The figure indicates the menstrual cycle in human female.

b) Which human organs are involved in this process?

Ans: The ovary and uterus are primarily involved in this process. But the pituitary gland also controls this cycle.

c) Which hormones take part in this process?

Ans: Following hormones regulate this menstrual cycle.

Pituitary hormones: Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH).

Ovarian hormones: Estrogen and progesterone.

d) What is the periodicity for these changes?

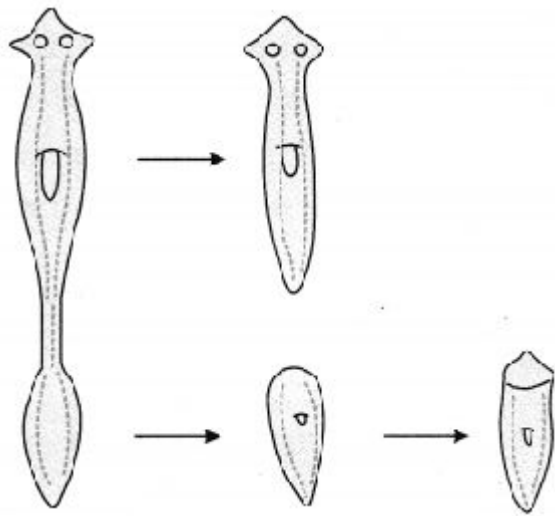
Ans: The menstrual cycle shows repetitive changes every 28 to 30 days.

e) The body of woman undergoing this process is impure, she should remain away from other people. What is your opinion about this statement? Give justification for your opinion.

Ans: A menstruating woman is not at all with impure body. It is a natural process in which the endometrium of the uterus is sloughed off and repaired.

She should get enough rest and nutrition during this period. It is painful period in which there is a possibility of infections. Therefore, she should take ! hygienic care and rest till the bleeding persists. But blind faith and superstition to keep her away from others should not be followed.

2) Observe the figure and answer the questions below:



i) Which process is shown in this figure? 1

Ans: Regeneration.

ii) Define the process. 2

Ans: Regeneration is the asexual reproduction in Planaria in which the body is broken up into two parts

and resulting each part regenerates remaining part of the body.

iii) In which organism this type of reproduction takes place? 1

Ans: Planaria shows such type of reproduction.

iv) Whether the lizard shows such type of regeneration? 1

Ans: Lizard shows the limited regeneration.



B.KUMAR'S ACADEMY

Subject : Science-II
Class : X

ANSWERS PAPER **4. Environmental Management**

Total Marks : 20

Q. 1 A) Choose the correct alternative.

2

1) ----- from manas sanctuary in Assam is under threat.

Ans : a) One horned rhino

2) Lion is ----- type of species

Ans : c) Vulnerable

Q. 1 B) Solve the following question. (Any One)

1

1. Reorganize the following food chain

Grasshopper → snake → paddy field → Eagle → frog

Ans : Paddy field → Grasshopper → frog → snake → Eagle.

2) Find the odd man out

Lion tailed monkey, white rats, musk deer, tiger

Ans : White rats.

3) Give one word for "The forest conserved in the name of god".

Ans : Sacred Groves.

Q. 2 A) Give scientific reason. (Any One)

2

1) The human being have important place in environment.

Ans : i) Since existence of human there is interrelation-ship between human and environment.

ii) Human being prove that he is superior as compared to other animal.

iii) Human utilized all natural resources to live satisfactory life.

iv) Human kept on snatching from the nature as much as possible and lead to increase the problem.

v) From this it is understood that human has crucial role in maintaining the environment balance.

vi) If human has disturbed the environmental balance then human itself only can conserve and improve the quality of nature.

vii) Therefore the human being have important place in environment.

2) Chipko movement was started by Bishnoi Samaj of Rajasthan.

Ans : i) Chipko Andolan started in 1970's was a non violent movement aimed at protection and conservation of trees and forests from being destroyed.

- ii) It is a movement that practiced the Gandhian method of non violent existence.
- iii) Bishnoi community and the trees which they were protecting were 'khejri'. In 1970's this sacrifice became the inspiration behind the chipko movement.
- iv) The Bishnois may be considered as India's first environmentalists. The famous 'Chipko movement' was inspired by the true story of Amritadevi Bishnoi.

Q. 2 B) Solve the following question. (Any Two)

4

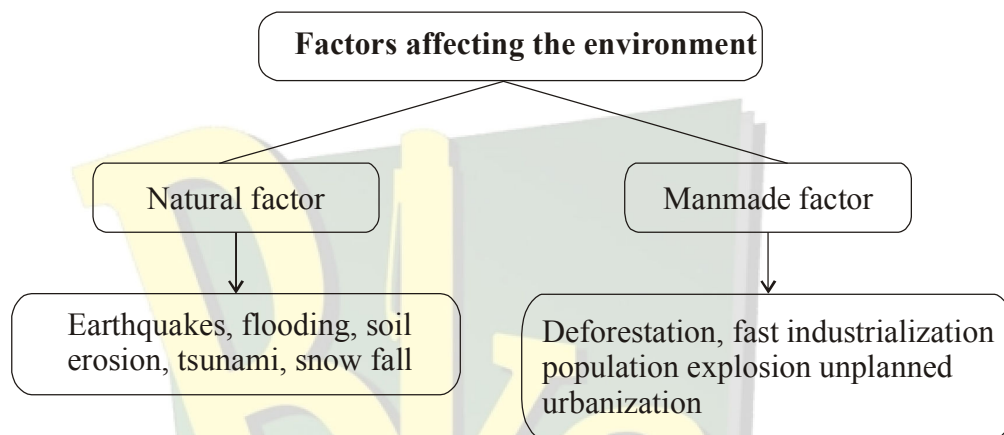
1) What is ecology and ecosystem?

Ans : **Ecology :** The science that deals with the study of interactions between biotic and abiotic factors of the environment is called as ecology.

Ecosystem : Basic functional unit used to study the ecology is called as ecosystem.

2) Complete the following flow chart.

Ans :



3) What is biodiversity? which are the different levels at which it occurs?

Ans : Biodiversity is the richness of living organisms in nature due to presence of varieties of organisms, ecosystems and genetic variations within a species.

Biodiversity occurs at three different levels.

- (1) Genetic Diversity.
- (2) Species Diversity
- (3) Ecosystem Diversity.

4) Write short note on sacred groves.

Ans : **Sacred Groves :** The forest conserved in the name of god and considered to be sacred is called as sacred grove.

- i) These are the 'sanctuaries' conserved by the society and not by government forest department.
- ii) As it has been conserved in the name of god. It has special protection.
- iii) These clusters of thick forest are present not only in western ghats of India but in the entire country. More than 13000 groves has been reported in India.

1) Classify the threatened species.

Ans : 1) **Endangered species :** Either number of these organisms is declined or their habitat is shrunk to such an extent that they can be extinct in near future if conservative measures are not implanted.

Example : lion tailed monkey, lesser florican.

2) **Rare species :** Number of these organisms is considerably declined. Organisms of these species being endemic may become extinct very fast.

Example : Red panda, Musk deer.

3) **Vulnerable species :** Number of these organisms is extremely less and continues to decline. Continuous decline in their number is worrisome reason.

Example – Tiger, Lion

4) **Indeterminate Species :** These organisms appear to be endangered but due to their some behavioral habits (like shyness) there is no definite and substantial information.

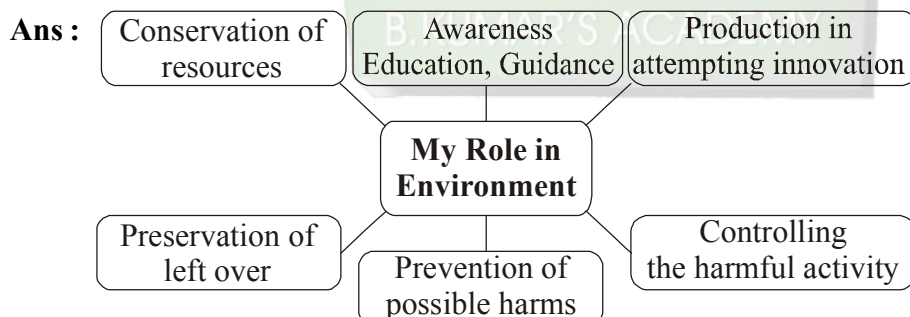
Example : Giant squirrel (Shekhru).

2) How the biodiversity can be conserved.

Ans : Biodiversity can be conserved by

- 1) Protecting the rare species of organisms.
- 2) Establishing national parks and sanctuaries.
- 3) Declaring some regions as bioserves.
- 4) Projects for conservation of special species.
- 5) conserving all plants and animals
- 6) Observing the rules
- 7) maintaining record of traditional knowledge.

3) Complete the following flow chart



4) What are the components, source and effects of air pollution

Ans : Components of air pollution :

Gases : CO₂, CO, Hydrocarbons

Solid : dust, ash, carbon

Source of air pollution :

- 1) Combustion of fuel
- 2) Smoke released in air in the large extend from industry.
- 3) Burning of coans.

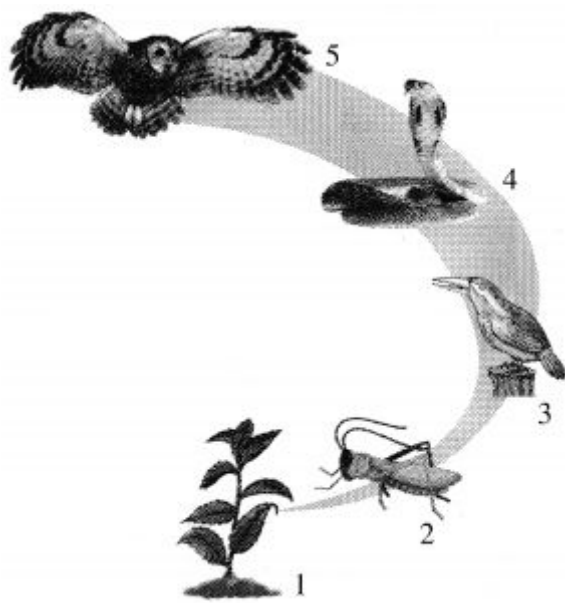
Effects of air pollution :

- i) Acid rain fall.
- ii) Global warming
- iii) Ozone layer depletion

Q. 4 : Solve the following question. (Any One)

5

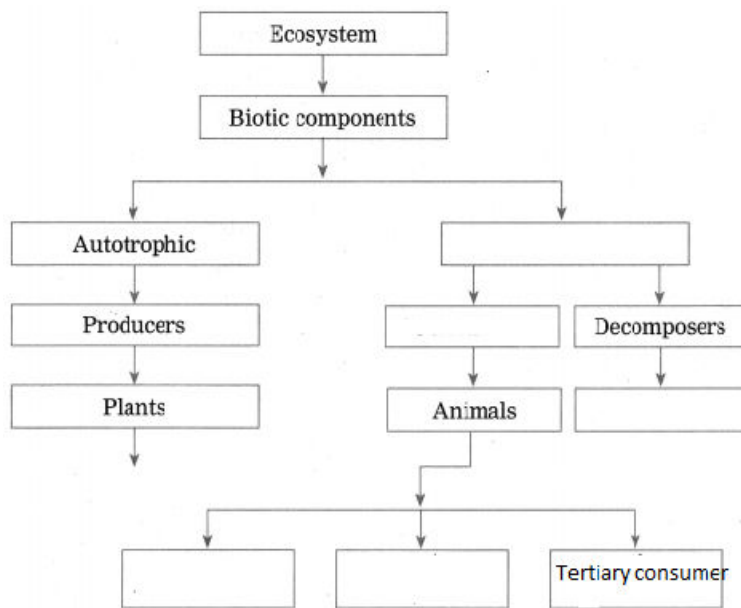
1) What is shown in the picture? Write name and trophic level of each component.



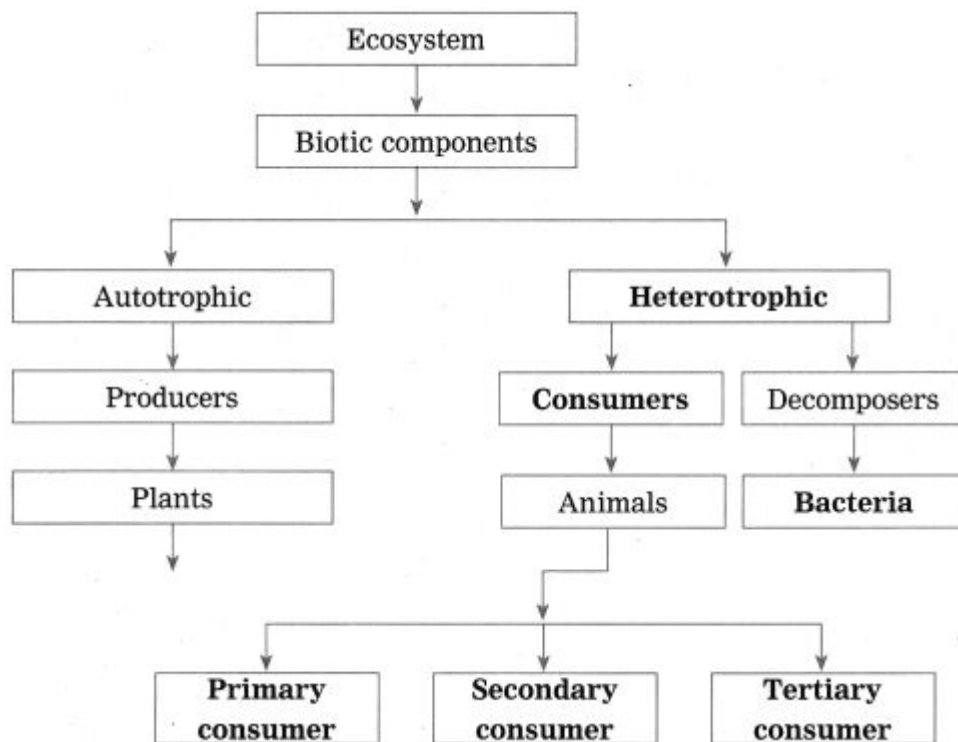
Ans: In this picture, food chain having five trophic levels is shown.

- (1) Trophic level 1 = Producers : Green plant.
- (2) Trophic level 2 = Primary consumer (Herbivore): Grasshopper.
- (3) Trophic level 3 = Secondary consumer (Carnivore): Bird.
- (4) Trophic level 4 = Tertiary consumer (Carnivore) : Snake.
- (5) Trophic level 5 = Top or Apex consumer (Carnivore) : Owl.

2) Complete the flow chart:



Ans:





B.KUMAR'S ACADEMY

Subject : Science -II
Class : X

Answer Paper 5. Towards green Energy

Total Marks : 20

Q.1: A) Choose the correct alternative : 2

1) Thermal energy is used to generate ----- energy.

Ans. : a) Electrical

2) ----- energy of water in dams is used for generation of electricity.

Ans. : b) Potential

B) Solve the following questions. (Any One) 1

1) Find the corelation

Biofuels : Nonconventional energy source : : coal : _____

Ans. : Biofuels : Nonconventional energy source : : coal : Conventional energy source.

2) Diagrammatically show energy transformation in thermal power plant.

Ans. :

Energy transformation in thermal power plant

3) Name the principle on which most of the electric power plants are based.

Ans. : Most of electric power plants are based on the principle of electromagnetic induction.

Q.2: A) Give scientific reason. (Any One) 2

1) Steam is used to rotate the turbine.

Ans. : i) The steam turbine is a device that extracts thermal energy from pressurized steam and used it to do mechanical work on a rotating turbines.

ii) All the heat and kinetic energy lost by the steam would be gained by the turbine and converted into useful K.E.

2) The energy in the coal is called as chemical energy.

Ans. : Chemical energy is energy stored in the bonds of chemical compounds. It is released in a chemical reaction often producing heat as a byproduct when bonds between atoms are broken or formed called a chemical reaction.

When the coal is heated between atoms are broken is produced due to the chemical reaction therefore the energy in the coal is called as chemical energy.

B) Solve the following question. (Any Two) 4

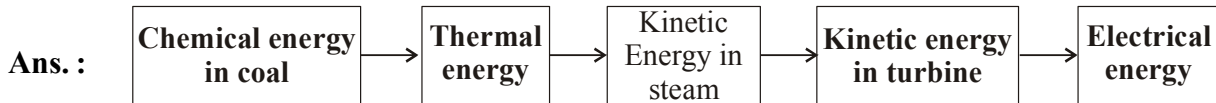
1) Write the advntages of nuclear power plant.

Ans. : Advantages of nuclear power plant :

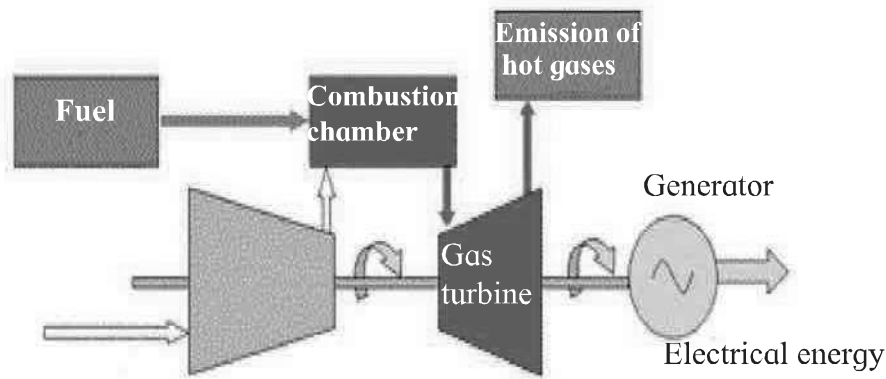
i) A nuclear power plant does not use fossil fuel like coal therefore problems like air pollution does not arise.

ii) If sufficient nuclear fuel is available this can be a good source of electrical energy.

- 2) Complete the flow chart of step by step transformation of energy in thermal power plant.



- 3) Observe the given diagram and answer the following question.



- Which fuel is used for this power plants?
- Is this power plant is environment friendly? Why?

Ans. :
 i) Combustion of natural gas is used as a fuel for this power plant.
 ii) Yes, this power plant is environment friendly because the natural gas does not contain sulphur so burning of natural gas results in less pollution.

- 4) What are the limitation of solar energy?

Ans. :
 i) Solar energy storage is expensive.
 ii) Sun do not shine 24 hr of day. When sun is not shining there is no generation of energy.
 iii) Solar panel required large space.
 iv) Material used to make solar panel can cause pollution.
 v) Complication in moving the solar panel.

Q.3: Solve the following questions. (Any Two)

6

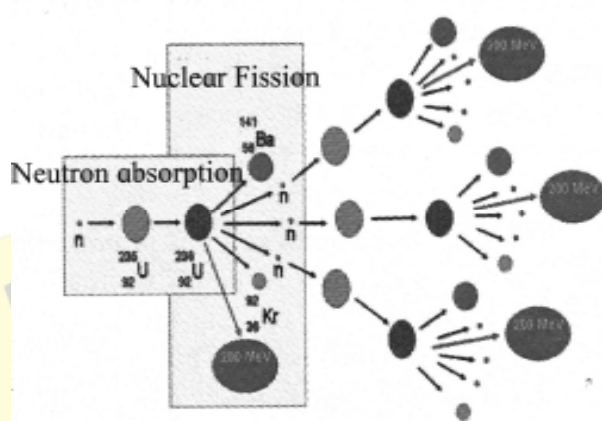
- 1) What are the problems related to thermal power generation?

Ans. : The problems related to thermal power generation are.

- Air pollution due to burning of coal. Burning of coal results in emission of gases like carbon dioxide, sulphur oxide and nitrogen oxide which are harmful to the health.
- Along with the emission of gases due to burning of coal, soot particles are also released into the environment. This may cause serious health problems related to the respiratory system.
- The reserves of fuel used in this method i.e. coal are limited. Therefore in future, there will be limitations on the availability of the coal.

2) How does nuclear fission take place?

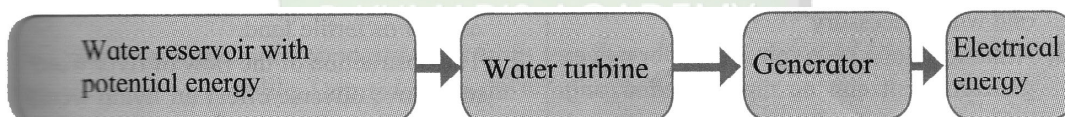
- Ans. :**
- 1) When neutron is bombarded on atom of uranium – 235, it absorbs the neutron and converts into its isotopes uranium – 236.
 - 2) Uranium – 236 being extremely unstable converts into atoms of Barium and Krypton through a process of fission releasing three neutrons and 200 mev energy.
 - 3) The three neutrons generated in this process causes fission of three other uranium – 235 atoms releasing more energy.
 - 4) The neutrons released in this reaction release more energy through fission of more uranium nuclei.
 - 5) This process of uranium – 235 atoms continues and is called the chain reaction.
 - 6) In nuclear power plants, a controlled chain reaction results in release of thermal energy, which is used for electric energy generation.



Nuclear fission (Chain reaction)

3) Explain the advantages of hydroelectric power plant using a block diagram.

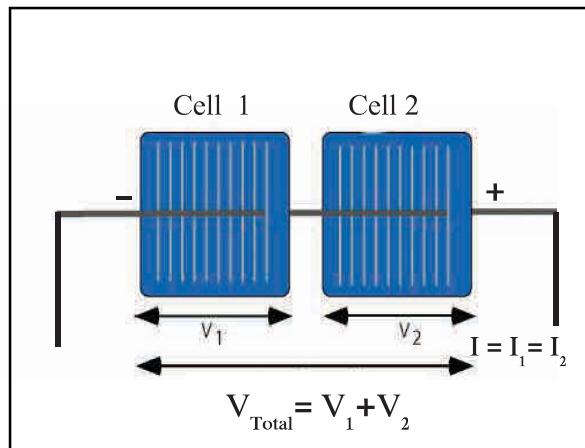
- Ans. :**
- 1) Since no fuel is burnt in hydroelectric power generation, there is no pollution resulting from combustion of fuels.
 - 2) If there is sufficient water storage in the dam, it is possible to generate electricity as and when necessary.
 - 3) Although water reservoir is used for power generation, it can be replenished during rainy season leading to uninterrupted power generation.



Different Stages in hydroelectric power plant

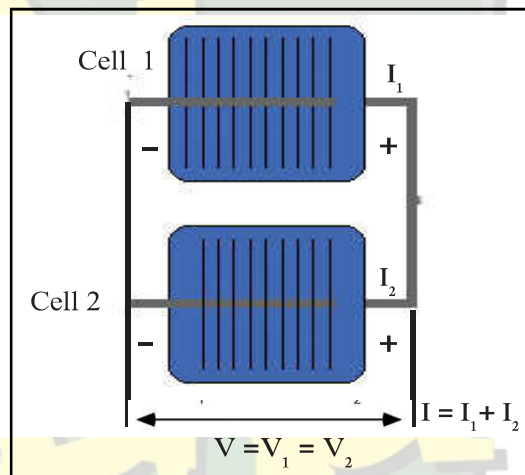
4) How can we get the required amount of energy by connecting solar panels?

- Ans. :**
- 1) If two solar cells are connected in series, the potential difference obtained from the combination is addition of the potential differences of individual solar cells.
 - 2) However, the current generated from this combination, is equal to the current from an individual cell.
 - 3) It means that when solar cells are connected in series, currents from the individual cells are not added



Solar cells in series

- b) 1) Similarly if two solar cells are connected in parallel, the current generated from this combination is the summation of the currents from an individual solar cells.
- 2) However, the potential difference, obtained from this combination is the same as the potential difference obtained from individual cells.
- 3) Thus, if two solar cells are connected in parallel, the potential differences from the Two cells are not added.



Solar cells in parallel

In this way, by connecting many solar cells in series and in parallel solar panels generating required current and potential differences are made.

Q. 4: Solve the following question. (Any One)

5

- 1) **Read the paragraph and answer the questions given below:**

Renewable energy is,power relies on the flow of water.

- a) **What is renewable energy?**

Ans: Renewable energy is energy that is produced from sources which will not get exhausted within a human's life time.

- b) **Give the examples of renewable energy.**

Ans: Wind, solar, geothermal, biomass and hydroelectric power are some examples of renewable energy.

c) **Why will energy from fossil fuel be over soon?**

Ans: Fossil fuels are exhaustible in their amount. We have been using these extensively in the past 100 years and hence it may get over soon. It is a non-renewable resource.

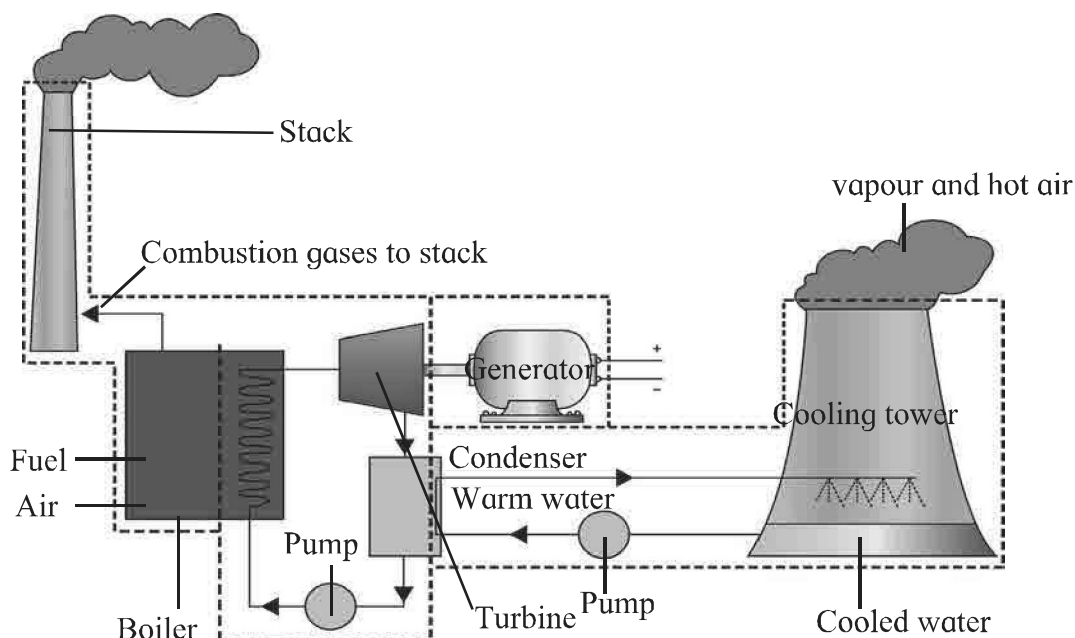
d) **Name the renewable sources of energy which are not dependent on sun. What are they dependent upon?**

Ans: Geothermal energy, tidal energy and hydroelectric power are renewable energy resources which are not dependent on sun. Geothermal energy utilizes the Earth's internal heat, tidal energy relies on the gravitational pull of the moon, and hydropower relies on the flow of water.

e) **Which type of energy do we mostly use in India?**

Ans: The most used energy resource is coal, i.e. fossil fuel based energy followed by hydroelectric energy.

2) **Observe the given diagram and answer the following questions.**



i) **Name the power plant shown in the figure.**

ii) **How turbine is rotated in this plant?**

iii) **Name the two towers seen in given diagrams.**

iv) **What is the function of condenser?**

v) **Name the fuel used in this plant.**

Ans. : i) It is thermal power plant.

ii) Turbine is rotated by using steam.

iii) There are two towers in this plant

i) Stalk - Tower no - 1

ii) Cooling Tower

iv) The steam is condense back to water by releasing heat in water.

v) In this plant coal fossil fuel is used.



B.K.KUMAR'S ACADEMY

Subject : Science -II
Class : X

Answer Paper 6. Animal Classification

Total Marks : 20

Q.1: A) Choose the correct alternative :

2

1) The body wall of Hydra is -----

Ans. : c) Diploblastic

2) Spicules are made up of -----

Ans. : d) Calcium carbonate.

B) Solve the following questions. (Any One)

1

1) Match the following.

Ans. :

A

Answer

a) Hydra

b) Radial Symmetry

b) Planaria

a) Bilateral symmetry

2) Complete the analogy.

Coelenterata : _____ : Platyhelminth : Triploblastic

Ans. : Coelenterata : **Diploblastic** : Platyhelminth : Triploblastic

3) Write true or False.

Amphibians have a two habitat life cycle.

Ans. : True

Q.2: A) Give scientific reason. (Any One)

2

1) Bat is included in mammalia class.

Ans. : i) Mammary gland is present in the bat.

ii) Bats are warm blooded

iii) Body is divided into head, neck, trunk and tail.

iv) Exoskeleton is in form of hair or therefore bat is included in mammalia class.

2) Our body irritates if it comes in contact with jelly fish.

Ans. : i) Jelly fish belongs to phylum coelenterata that contain specialized cells called endoblasts that inject toxins when in contact with anything

ii) When our body brushes against a tentacle these cnidoblast containing tiny stings penetrates the skin and toxin is release.

iii) The toxin and the sting affect the area of the skin toxin also enters the blood stream.

iv) Due to this there is rashes and itchiness on due skin causing an irritating sensation. Due to the ability of jelly fish to inject toxin our body irritates if it comes in conact with jelly fish.

: B) Solve the following question. (Any Two)

4

1) What is notochord?

Ans. : Notochord is a long rod like, Supporting structure present on dorsal side of animal body. It keeps the nerve tissue isolated from remaining body.

2) Write about phylum Annelida

Ans. : Characteristics of Phylum Annelida :

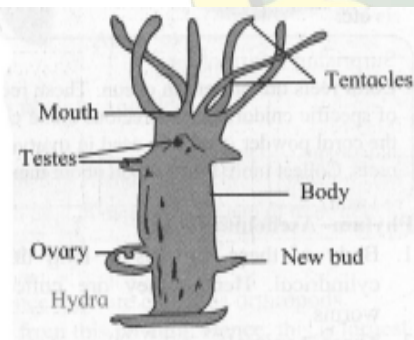
- 1) Body of these animals is long, cylindrical and metamerically segmented.
- 2) Most of the animals are free living, but few are ectoparasites. Free living animals may be marine or fresh water dwellers or terrestrial.
- 3) These animals are triploblastic, bilaterally symmetrical and eucoelomate.
- 4) They have setae or parapodia or suckers for locomotion.
- 5) Their body is covered with special cuticle.
- 6) These animals are either hermaphrodite or unisexual example Earthworm, Leech, Nereis etc..

3) Write about hydrocarbonoclastic bacteria.

Ans. : Spilling of petroleum oil occurs in ocean due to various reasons. This oil may prove fatal and toxic to aquatic organisms. It is not easy to remove the oil layer from surface of water by mechanical method. However bacteria like pseudomonas spp. and Alcanovorax bockumensis have the ability to destroy the pyridines and other chemicals. Hence these bacteria are used to clear the oil spills. These are called hydrocarbonoclastic bacteria (HCB). HCB decompose the hydrocarbons and bring out the reaction of carbon with oxygen CO_2 and water is formed in this process.

4) Draw a well labelled diagram of Hydra.

Ans. :



Q.3: Solve the following questions. (Any Two)

6

1) Explain body symmetry and its types.

Ans. : In Imaginary sense if body of any animal is cut through imaginary axis of body it may or may not produce two equal halves. Depending upon this property there are different types of animal bodies.

Asymmetrical body : In case of such body, there is no any imaginary axis of the body through which we can get two equal halves.

Example – Amoeba, Paramoecium, some sponges.

Radial symmetry. : In this type of body, if imaginary cut passes through central axis but any plane of body, it gives two equal halves, example – starfish.

In case of this animal, there are five different planes passing through central axis of body through which we can get two equal halves.

Bilateral symmetry : In this type of body, there is only one such imaginary axis of body through which we can get two equal halves example – Insects, fishes, frog birds, human.

2) Write difference between non chordates and chordates.

Ans. :	Non Chordates	Chordates
	1) Body is not supported by rod – like notochord	1) Body is supported by notochord.
	2) Pharyngeal gill slits are absent	2) Pharyngeal gill-slits or lungs are present.
	3) Nerve cord, if present it is on ventral side. It is solid and paired.	3) Nerve cord is present on dorsal side of body. It is hollow.
	4) Heart, if present, it is on dorsal side.	4) Heart is present on ventral side of body.

3) Write in detail about class cyclostomata of phylum Echinodermata.

Ans. : Class cyclostomata :

- 1) These animals have jaw less mouth provided with sucker.
- 2) Their skin is soft and without any scale.
- 3) Paired appendages are absent.
- 4) Endoskeleton is cartilaginous.
- 5) Most of the animals are ectoparasites Example petromyzon, Myxine.

4) Write short note on Bath sponge.

Ans. : Bath sponge :

This is a black coloured and somewhat round shaped animal. Its body is mainly made up of fibers of a protein spongin and due to this, they have good water holding capacity. It was used for bathing during old days. Besides it was also used for manufacturing of pillows and cushions. These were also used as wetting material for sticking postal stamps and counting the currency notes.

Q. 4: Solve the following question. (Any One).

5

1) Identify the class of given animals and write one characteristic of each animal:

(1) Kangaroo (2) Penguin (3) Crocodile (4) Frog (5) Sea-horse.

Ans: (1) Kangaroo: Class Mammalia. It is a marsupial animal with pouch for development of offspring. Long hind limbs for jumping.

(2) Penguin: Class Aves. It is flightless bird. Body covered with thick feathery coat. Oviparous mode.

(3) Crocodile: Class Reptilia. It is a large animal seen near water bodies. Can swim in water but cannot respire in water. Body covered with exoskeleton of scaly plates. Limbs very weak in comparison with huge bodies.

(4) Frog: Class Amphibia. Shows aquatic as well as terrestrial mode. Can breathe with lungs and skin. No exoskeleton and skin is slimy.

(5) Sea-horse: Class Pisces. Bony fish. Highly modified body structure showing brood pouch for development of offspring gills for respiration, fins for swimming.

2) I) Write the classification of the following according to given points

- i) Shark ii) Frog
a) Kingdom b) Phylum c) Subphylum d) Class

II) Write two character of shark and frog.

Ans. : I) i) Shark :

Kingdom - Animalia

Phylum - Chordata

Subphylum - vertebrata

Class - pisces

ii) Frog :

Kingdom - Animalia

Phylum - Chordata

Subphylum - Vertebrata

Class - Amphibia

II) Character of shark

- 1) Respiration occurs with gills
- 2) These are cold blooded aquatic animal.

Character of frog :

- 1) These animals are strictly aquatic during laral life and perform only aquatic respiration where as they can live in water as well as on land during adult life and can perform aquatic as well as aerial respiration
- 2) Exoskeleton is absent.

B.KUMAR'S ACADEMY



B.K. KUMAR'S ACADEMY

Subject : Science -II

Answer Paper

Total Marks : 20

Class : X

7. Introduction to Microbiology

Q.1: A) Choose the correct alternative :

2

- 1) ----- impacts the characteristic taste to yoghurt.

Ans.: d) Acetaldehyde

- 2) ----- imparts thickness to icecreams and pudding.

Ans.: c) Xanthangum

B) Solve the following questions. (Any One)

1

1) **Complete the analogy.**

Candida : **cocoa** : : Lactobacillus brevis : coffee

2) **Find odd one out.**

Methane, ethanol, Hydrogen gas, petroleum.

Ans.: Petroleum

3) **Give one word for the following**

An example of compound used as emulsifier.

Ans.: Polysaccharides / glycolipids

Q.2: A) Give scientific reason. (Any One)

2

1) **The probiotics have developed much importance in recent days.**

Ans.: These products form the colonies of useful microbes in alimentary canal and control other microbes and their metabolic activities, improve resistance and lower the ill effects of harmful substances formed during metabolic activities. Useful microbes become inactive due to antibiotics, probiotics make them active again

Therefore the probiotics have developed much importance in recent days.

2) **Compressed yeast is used in commercial bakery industry.**

Ans.: Compressed yeast is used in commercial bakery industry because it is available in dry granular form for domestic use yeast produced for commercial use contains various useful contents like carbohydrates, fats, proteins, various vitamins and minerals.

Due to this bread and other products produced with the help of yeast become nutritive.

B) Solve the following question. (Any Two)

4

1) **What are hermaphrodite?**

Ans.: **Hermaphrodite :** Hermaphrodite means male and Female reproductive systems are present in the same animal body.

2) **How can bacteria control the soil pollution occurring due to acid rain?**

Ans.: 1) Sulphuric acid is present in the acid rain and materials coming out of mines.

2) Erosion of metals present in statues, bridges and building occurs due to it.

3) Sulphuric acid is source of energy for some species of bacteria, like *Acido phillium* spp and *Acidobacillus ferrooxidans*.

4) Hence these bacteria can control the soil, pollution occurring due to acid rain.

3) Write about hydrocarbonclastic bacteria.

Ans.: Spilling of petroleum oil occurs in ocean due to various reasons. This oil may prove fatal and toxic to aquatic organisms. It is not easy to remove the oil layer from surface of water by mechanical method. However bacteria like pseudomonas spp. and Alcanovorax bockumensis have the ability to destroy the pyridines and other chemicals. Hence these bacteria are used to clear the oil pills. These are called hydrocarbonoclastic bacteria (HCB). HCB decompose the hydrocarbons and bring out the reaction of carbon with oxygen CO_2 and water is formed in this process.

4) Distinguish between Applied microbiology and Industrial microbiology.

Applied Microbiology	Industrial microbiology
i) Applied microbiology is the study related to enzymes, proteins, molecular biology etc.	i) Industrial microbiology is the science related to commercial use of microbes for various economic, social and environment related processes.
ii) This branch looks how one can utilize the abilities possessed by microbes for various research.	ii) This branch strives to put to use abilities of microbes and improve their abilities from a commercial point of view.

Q.3: Solve the following questions. (Any Two)

6

1) Write a note on biofuel.

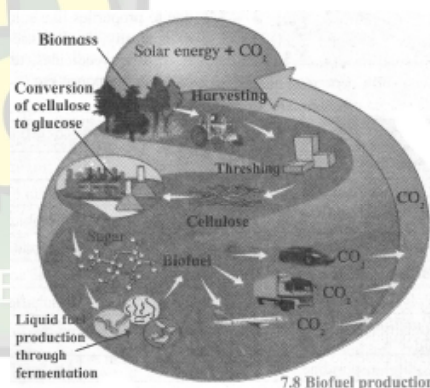
Ans.: Bio-fuel

- 1) Bio fuel is important among the renewable source of good energy.
- 2) These fuels are available in solid liquid and gaseous forms
- 3) These fuels are easily available and in plenty of quantity.
- 4) These are reliable fuels of the future.

2) Write about microbes and fuels.

Ans.: Microbes and fuels :

- 1) **Gaseous fuel :** methane can be obtained by microbial anaerobic decomposition of urban agricultural and industrial waste.
- 2) Ethanol, an alcohol is a clean (smoke less) fuel obtained during fermentation of molasses by the yeast saccharomyces.
- 3) Hydrogen gas is considered to be the fuel of future. Hydrogen gas is released during bio-photolysis of water in which bacteria perform the photo reduction.

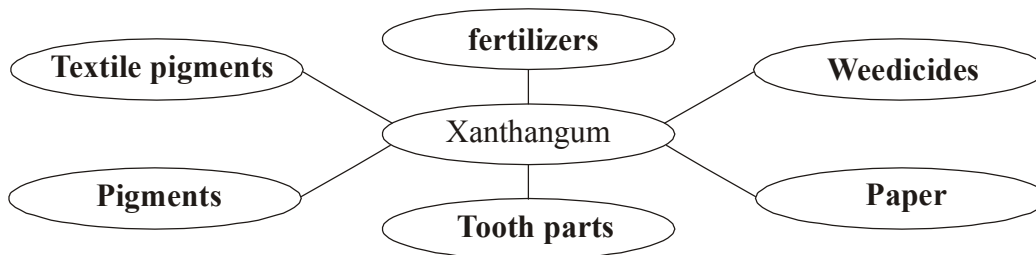


3) Why it is necessary to ban the use of plastic?

- Ans.:**
- i) Plastic contains a chemical substance PET (polyethylene threphthalate polyester)
 - ii) PET is a non degradable compound that can be acted upon by only a few microbes Due to this it stays accumulated in the environment.
 - iii) Plastic being used for storing garbage is although biodegradable polylactic acid it gets degraded after prolonged period of time.
 - iv) Thus such materials due to the time taken for then to get degraded should be banned.

4) Complete the chart

Ans.:



Q. 4: Solve the following question. (Any One)

5

1) Read the paragraph and answer the questions given below:

Remediation is the process..... the crude oil films into carbon dioxide and water.

a) What is the meaning of remediation?

Ans: Remediation is the process by which dangerous or toxic substances are removed from the environment.

b) What is the difference between phytoremediation and microbial remediation?

Ans: When any plant species are used for remediation process, then it is called phytoremediation, whereas when any microbe species used for remediation then it is called microbial remediation.

c) Which environmental pollutant is mainly removed through bioremediation processes?

Ans: Toxicants released through sewage and crude oil are removed by bioremediation processes.

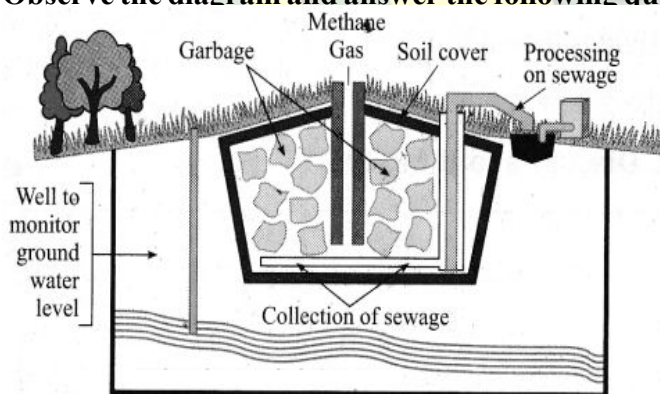
d) What is the role of *Pseudomonas aeruginosa*?

Ans: *Pseudomonas aeruginosa* helps in bioremediation by acting on film of crude oil and reduces it to carbon dioxide and water.

e) Why Dr. Anand Chakraborty's work phenomenal?

Ans: Dr. Anand Chakraborty discovered that *Pseudomonas aeruginosa* bacteria can act on oil film which is toxic and reduce it to nontoxic products. This helps in controlling the oil pollution of marine waters which otherwise is very difficult to control.

2) Observe the diagram and answer the following questions:



Modern landfill site

a) Name the following method of solid waste management.

1

Ans: The above diagram shows modern landfill site. This method is used for solid waste management.

b) What type of waste is used in this method?

2

Ans: In this method only degradable waste matter collected in cities can be used. Such solid waste can undergo biodegradation and hence can be managed in an eco-friendly way.

c) What kind of useful substances can be obtained from such methods?

2

Ans: From such decomposition, organic fertilizers and manure formed through composting are obtained. Methane gas is also obtained which is used as fuel.



B.K. KUMAR'S ACADEMY

Subject : Science-II
Class : X

Answer Paper **8. Cell biology and Biotechnology**

Marks : 20

Q.1: A] Choose the correct alternative.

2

1) A person with symptoms of fatigue, non healing wounds, constant thirst and urge to urination and high blood sugar should be treated with

Ans: (a) Insulin

2) _____ among the following organisms are useful in clearing oil spills.

Ans: (c) Pseudomonas

B] Solve the following question (Any One).

1

1) Complete the analogy :

Insulin : Diabetes :: Interleukin : _____

Ans: Insulin : Diabetes :: Interleukin : Cancer

2) Find odd one out :

BT cotton, Golden rice, BT brinjal, Anabaena

Ans: Anabaena

3) Give answer in one or two words :

The ability of stem cells to self multiply and differentiate into any type of cell.

Ans: Pleuripotency

Q.2: A] Give scientific reason. (Any One)

2

1) DNA finger printing can be done in order to resolve a paternity dispute regarding a child.

Ans: i) DNA fingerprinting is the technique by which the identity of any individual can be established since DNA sequence is unique for every individual.

ii) DNA fingerprinting involves studying the sequence of DNA of the child and the claimed biological fathers.

iii) The sequence of the child is then compared with that of father and the percentage similarities are found.

iv) The person with whom the child DNA shows highest percentage similarity is considered to be biological father. Thus DNA finger printing can be done order to resolve a paternity dispute regarding a child.

2) Organic farming is considered to be the future of agriculture sector.

Ans: i) Organic farming is the use of organic products for farming over chemical pesticides and fertilizers.

ii) Chemical fertilizers and pesticides are considered to be poisonous if reached to humans through food and water.

iii) Chemical fertilizers also cause serious deterioration in the fertility of soil.

iv) Organic farming can overcome all these problems as it uses biofertilizers and biopesticides.

Since organic farming includes complete ban on chemical fertilizers and pesticides, Therefore organic farming is considered to be the future of agriculture sector.

B] Solve the following question. (Any One)

4

1) What is white revolution?

Ans: i) Dr. Varghese Kurien proved through the co-operative movement and use of biotechnology that Dairy will be a mainstream business.

ii) While achieving the self sufficiency in dairy business, various experiments were performed for quality control, newer dairy products and their preservation.

iii) Sudden increase in milk and milk products on a large scale is called as white revolution.

2) Define : (i) Bioremediation (ii) Cloning

Ans: (i) Bioremediation :

It is the absorption of or destruction of toxic chemicals and harmful pollutants by plants or microorganisms.

(ii) Cloning :

Production of replica of any cell or an entire organism is called cloning.

3) What are the uses of stem cells?

Ans: Stem cells uses :

1) Regenerative therapy :

Cell therapy stem cells are used to replace dead cells in conditions like diabetes, myocardial infarction, alzheimer's disease parkinson's disease etc.

2) Organ transplantation :

Stem cells are used to produce organs like kidney and liver for organ transplantation.

4) Which precaution will you take during spraying of pesticides?

Ans: The precautions that have to be taken during spraying of pesticides are as follows.

i) Pesticides should be applied at recommended dose and dilution.

ii) Do not apply pesticides on hot sunny day, Stormy winds, just before or after rains.

iii) Animal and worker entry at the fields immediately after application of pesticides should be avoided.

iv) Container bucket used for mixing pesticides should not be used for domestic purpose.

Q.3: Answer the following (Any Two).

6

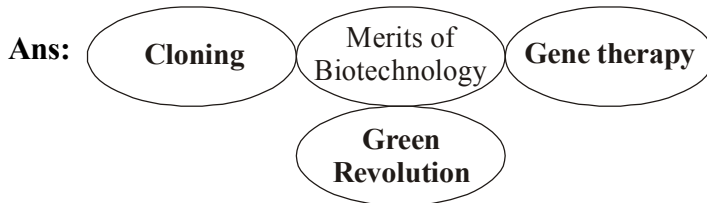
1) Write short note on edible vaccines.

Ans: Edible vaccines :

i) Work on production of edible vaccines is in progress and presently, potatoes are being produced with the help of biotechnology.

- ii) These potatoes are called transgenic potatoes.
- iii) These potatoes will act against bacteria like *Vibrio cholerae*, *Escherichia coli*.
- iv) Consumption of these raw potatoes generates the immunity against Cholera and the disease caused due to *E. coli*.
- v) This can develop immunity against that pathogen.

2) Complete the chart :



3) Write the importance of medicinal plants.

- Ans:**
- i) Medicinal plants provide three main benefits to the ones who consume them financial benefits, health benefits and society wide benefits like job opportunities.
 - ii) Plants have a preventive nature with respect to onset of any disease.
 - iii) Many plant have antioxidant properties ingestion of whom can prevent the action of free radicals in the host.
 - iv) In some cases the treatment of complex diseases requires the help of certain medicinal plants or their derivatives.
 - v) The active ingredient in plant *Adulsa* can be given to cure cough.

4) Write the commercial application of biotechnology.

Ans: a) Hybrid - seeds :

Genes of two different crops are recombined to form hybrid variety of crops.

b) Genetically modified crops :

Crops developed of desired characters by integrating foreign gene into a crop

c) BT cotton

Produced by introducing gene for a toxin from *Bacillus thuringiensis* with the gene of cotton.

BT Brinjal is also produced similarly.

d) Golden rice :

Gene beta carotene is introduced into a variety of rice.

e) Herbicide tolerant plants :

These are produced as a measure to selectively destroy weeds.

f) Biofertilizers :

Bacteria like rhizobium, *Azotobacter*, *Nostoc*, *Anabaena* and *Azolla* are ued.

Q.4: Solve the following question. (Any One)

5

1) Read the following question and answer the following question.

Green corridor refers to aThis was possible due to Green corridor.

a) What is Green corridor?

Ans: Green corridor is a special road route that enables harvested organs meant for transplants to reach the destined hospital

b) Which organs of brain-dead lady were transplanted?

Ans: Two kidneys, liver and heart of the brain- dead lady were transplanted.

c) How many lives were saved from organs of one lady?

Ans: Four patients lives were saved due to organ donation of one lady.

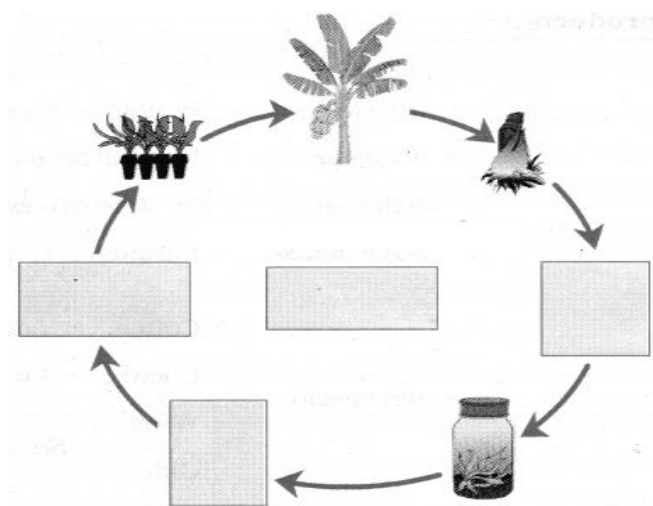
d) How was distance of 18km covered in 16 minutes? Why?

Ans: The distance was covered because the concept of Green corridor was applied. The heart was sent from one hospital to another, where the recipient was kept ready. The quick transportation is necessary to keep heart in living condition.

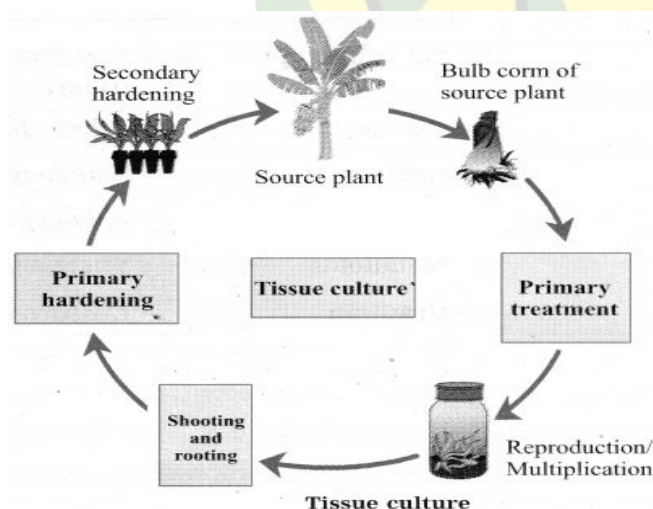
e) Who takes the decision to donate the organs?

Ans: The close relatives of deceased person take the decision to donate the organs.

2) Assign names in the figure given below . Define tissue culture.



Ans:



Tissue culture: Tissue culture is an artificial method of culturing plants. In this method, a small part of the plant is used to grow cells in a nutrient solution in the sterile condition of the laboratory.

* * *



B.KUMAR'S ACADEMY

Subject : Science-II

Answer Paper

Marks : 20

Class : X

9. Social Health

Q.1: A] Choose the correct alternative.

2

1) Laughter club is a remedy to drive away -----

Ans: (a) Mental stress

2) Carcinogenic effect of tobacco containing substances on mouth and _____

Ans: (a) Lungs

B] Solve the following question. (Any One)

1

1) Write true or false :

Addictive person can not think rationally.

Ans: True

2) Find the correlation :

Laughter club : Relieve mental stress : : Meditation : _____

Ans: Laughter club : Relieve mental stress : : Meditation : **Improve the ability of concentration**

3) Name the NGO which provide helping hand to depression.

Ans: i) United Movement Against Tobacco

ii) Salaam Mumbai Foundation

iii) Government Schemes

Q.2: A] Give scientific reason. (Any One)

2

1) Children are facing loneliness and mental stress.

Ans: Children are facing the problems like loneliness and mental stress due to reasons like i) nuclear family and parents staying outdoor due to job.

ii) Due to over watching crime and violence in TV programs continuously they got a mental stress.

iii) Due to the watching TV and using mobile phones continuously they become less sensitive towards others.

2) Nature plays an important role in relieving stress.

Ans: i) Nature is closest friend of human being.

ii) Hobbies like gardening, bird watching lingering in nature, rearing domestic animals etc helps to create positive mindset, improves confidence. Social health can be maintained by keeping ourselves aware about happening around us neutralizing the negative thoughts.

B] Solve the following question. (Any Two)

4

1) Give the examples of diseases endangering the social health.

Ans: AIDs, TB, Leprosy and Mental disorders are diseases which endangering the social health.

2) What is stress management?

Ans: Stress management is a wide spectrum of techniques and psychotherapies aimed. All controlling a person's level of stress especially chronic stress usually for the purpose of improving every day functioning.

3) Define social health.

Ans: Social health is the ability of a person to establish relationship with other persons.

4) Write the various physical problems arises due to radiation of cell phones.

Ans: Various physical problems like tiredness, headache, insomnia, forgetfulness, joint pain and problems in vision may arise due to radiation of cell phones.

Q.3: Solve the following question. (Any Two)

6

1) Explain the importance of good communication with others.

Ans: i) Communication plays vital role in human life.
ii) Due to good communication we can share our feelings, express our feelings with near one and dear ones which helps us to relieve the stress.
iii) Communication is the correct way to divert the energy and mind towards the positive thinking negative thoughts are automatically neutralized.
iv) Due to communication we remains update and our confidence rises which develop our personality which is important for our carrier.
v) Communication is a best media to exchange message, information and knowledge between two or more person and develops common understanding.

2) Write note on working of Salaam Mumbai Foundation.

Ans: i) This organization runs programs in various schools in Mumbai to empower the children living in slum area in the field of education sports, arts and business.
ii) This trust has made some districts in Maharashtra completely tobacco free through hard work.
iii) Since the years 2012 this organization is working with various school in urban and rural area for making the society tobacco free.

3) Give three examples of hobbies to reduce stress.

Ans: Hobbies to reduce stress are :

i) Photography ii) Cooking iii) Sculpturing

4) What are the change occur in children due to continuously using mobile phones.

Ans: i) Tendency and behaviour of the children who play the games like virtual and car races deliberately brought about virtual accidents in games gradually become negative
ii) Some games available on cell phones and computers are extremely time consuming and also cause economic losses to lose concentration on some essential subjects and may also prove fatal.
iii) Along with some useful purpose huge information available on internet is used for viewing some inappropriate videos too.

1) Observe the figure and answer the questions given below.



(a) What do these figures indicate?

Ans: The above figures indicate different types of cybercrime.

(b) Which gadgets can be misused for these?

Ans: The gadgets that are usually used for cybercrime are internet connected computers, cell phones, ATM machines, debit and credit cards, etc. Also using aadhar and PAN cards of others.

(c) Give two examples of such events.

Ans: (1) Bank transactions are done without the knowledge of the account holder by stealing necessary numbers or pass codes. (2) By opening the fake accounts of social media and deceiving girls, harming them psychologically by teasing them. (3) Deceiving customers by showing superior options on the internet and providing inferior ones when bought. In online shopping many may be cheated in this way.

(d) Name the act amended by Government of Maharashtra to control such events.

Ans: IT Act-2000 is the act enacted since 17th Oct. 2000 and amended in 2008 that has been imposed by Government of Maharashtra to control cybercrimes.

(e) What care should be taken by a person to avoid such events?

Ans: To prevent cybercrimes, one has to keep vigil over bank transactions. Never reveal any details on the phone. The ATM pin number and PAN or AADHAR details should not be revealed to anyone. While at ATM machines, the pin number should be covered. Always log out from the internet after the work is over.

2) Observe the following figure and answer the given questions:



(a) What does this picture given in the textbook indicate?

1

Ans: Given picture indicates that person is suffering from mental problem. He is under severe depression and frustration. Person may be using the drugs.

(b) Explain any two causes for this problem.

2

Ans: Causes of this problems are as under:

- i) Nuclear families and working parents.
- ii) Poverty, divided family and unemployment. Addiction is major cause of this problem.

(c) Describe any two measures to eradicate this problem.

2

Ans: Measures to eradicate this problem:

- i) By good communication with parents or family members harmonious relation can be re-established.
- ii) Help from counsellors can be helpful to minimize the problem.

* * *





B.KUMAR'S ACADEMY

Subject : Science-II
Class : X

Answer Paper **10. Disaster Management**

Marks : 20

Q.1: A) Choose the correct alternative.

2

1) Disaster definitely affect the economy of _____

Ans: (c) Nation

2) Tsunami is a _____ disaster.

Ans. (a) Geophysical

B] Solve the following question. (Any One)

1

1) Identify the correlation :

Drought : _____ : : Fungal disease spreading : Biological disaster

Ans: Drought : **Geophysical disaster** : : Fungal disease spreading : Biological disaster

2) Write true or false :

At the district level Tahsildar is responsible for disaster management and implementation of rehabilitation schemes.

Ans: False

3) Name the catastrophic disaster.

Ans. Cyclones in odisha, Earthquakes of Gujarat and Latur, frequently buzzing cyclones in coastal Andhra Pradesh.

Q.2: A] Give scientific reason. (Any One).

2

1) Human disasters are increase after the world war-II.

Ans: i) The reasons for increase in human disasters after the world war II are economic inequality racial and religious differences etc.

ii) Incidences like terrorism, abduction, social differences have been a routine now.

iii) Increasing population its increasing needs emerging problems out of it now at the extreme end.

2) It is essential to get the training of first aid.

Ans: i) First aid is help given to a sick or injured person until full medical treatment is available.

ii) The main objective of first aid is prevention of death preventing deterioration of health and starting the process of rehabilitation.

iii) So it is important to know about the emergency measures or first aid practices to be followed.

- iv) First aid helps ensure that the right methods of administering medical assistance are provided knowing how to help a person is just as important in emergency situations.
- v) It only takes six minutes for the human brain to expire due to lack of oxygen.
- vi) First aid CPR saves lives particularly where there are injuries and it is critical that immediate action is taken so it is very necessary to take essential training of first aid.

B| Solve the following question. (any Two).

4

1) What is disaster management?

Ans: 1) Disaster management is achieving or time to time improving the ability to face the disasters through scientific and careful observations and analysis of data.

For example, preparing the action plan through study of various aspects like preventive measures, rehabilitation and reconstruction and executing that plan is nothing but the management of disaster.

2) What is mock drill? explain.

Ans: 1) Mock drill is a practice to check the preparedness of facing the disaster as early as possible.

2) Virtual / Apparent situation of disaster is created to check the reaction time for any type of disaster.

3) Trained personnel observe their responsibility to check, execution of plan designed for disaster redressed.

4) This helps to check the efficiency of the system prepared for disaster redressed.

5) Mock drill is arranged on disaster of fire in various schools by the fire fighters.

6) It includes the demonstrations like extinguishing the fire, rescuing the people trapped at higher floors of buildings, rescuing the persons whose clothing have caught the fire, etc.

7) Such activities are also arranged by police force and voluntary organizations.

3) Name any ten necessary materials in first aid box.

Ans. The necessary material in first aid box :

(1) Bandage strips of different size (2) Wound gauze (3) Hand gloves (4) Medicated cotton (5) Soap (6) Scissor (7) Antiseptic (8) Blade (9) Small pins (10) Torch (11) Needle (12) Thermometer (13) Petroleum Jelly.

4) What is districtwise disaster control unit?

Ans: Districtwise Disaster control unit : District control unit is established immediately either after the impact after the impact of disaster (or) getting intimation about it.

It reviews about various aspects of disaster, keeps continuous contact with various agencies like army, air force, navy, telecommunication department etc. for getting help.

It is also responsible for coordinating with various voluntary organizations for their help in disaster management.

Q. 3 : Solve the following question. (Any Two)

6

1) Which are the 3 aspects of disaster important for common citizens?

Ans: i) Phase of emergency : Important character of this phase is that maximum lives can be saved by quick actions during this phase only. Various actions like search and rescue operations, medical assistance, first aid, restoring communication services, removing the people from affected area are expected in this phase.

ii) Transitional Phase : Rehabilitation work is started in this phase, after the subsidence of any type of disaster. It induces clearing debris, restoring water supply, repairing roads etc. so that it will help to bring normalcy in public life. Rehabilitation of the victims is important aspect of this phase. It helps to soothe the mental stress.

iii) Reconstruction phase : This is highly complicated phase. This phase begins in transitional phase. People reconstruct their buildings and facilities like roads and water supply are restored. Farming practices are restarted however, it takes long time for reconstruction.

2) Which different methods are used for transportation of patients? Why?

Ans: i) In emergency condition various transportation methods like cradle method, carrying on back, carrying on two hands are to be followed.

ii) Those methods depend upon the condition of victim.

iii) We face different types of major or minor disasters in our daily life.

iv) Varieties of disasters like accidents, stamped injuries in fighting, electric shock, burns, heat stroke, snake bite, fire due to electric short circuit etc happen around us.

v) Victims of disaster need to be offered some primary help before actual medical treatment

Various methods of transportation of victims :

i) **Cradle method :** Useful for children and under weight victims.

ii) **Carrying on back :** Useful for carrying patients who are unconscious

iii) **Stretcher :** In an emergency if a conventional stretcher is not available then a temporary stretcher can be made using bamboos, blanket etc.

3) Which are the destructive effects of flood?

Ans: Floods have large social consequences communities and individuals.

i) Damage of property ii) Destruction of crops.

iii) Collapsing of bridges iv) Shortage of food

v) The immediate impacts of flooding include loss of human life, living organisms life

vi) Floods can have the adverse effects on the economy, environment and people.

4) Write short note on disaster management.

Ans: Disaster Management : Disaster may be minor or major, short time or long – time, it should be overcome and effective disaster management is necessary for it. There is close relationship between disaster management and public participation. Disaster management is either prevention of disasters or making arrangements to face it or at least achieve the abilities to face it.

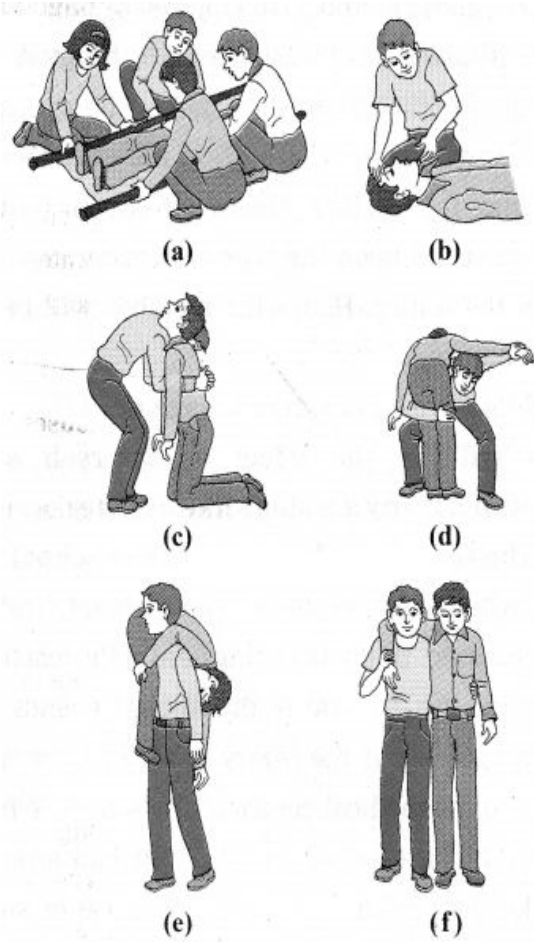
Disaster is a very fast process, in fact it is accident. What shall we do in such situation? How can we protect ourselves, our belongings and animals? is a management.

In case of disaster management, there should be an attempt to minimize the losses. Disaster are never planned but losses due it can be prevented in a planned manner.

Q. 4 : Solve the following question. (Any One)

5

- 1) **Give the reference of following pictures and explain importance of each of those in disaster management. .**



Ans: The actions shown in the above pictures are as follows:

(a) The patient is made to lie on the stretcher. He must be unconscious and injured to greater extent, so that he cannot move by himself.

(b) The patient is helped by giving artificial respiration. Probably the victim is suffocated and needs oxygen supply.

(c) and (d) The patient is being picked up. Most probably the patient is unconscious.

The unconscious person who cannot move by himself is carried by these two methods. In method 'c', the weight of the patient is less and hence he can be lifted as shown in the picture. In picture 'd' the victim has to be lifted in other way, may be due to his greater body weight.

(e) The patient is carried on the back as in 'carrying piggy back' position. He too is unconscious and needs to be shifted for medical treatment.

(f) The patient in this picture is carried by 'human crutch method'. When victim's one leg is injured, he cannot walk without support. Hence, he needs to be carried in such a way.

picture 'd' the victim has to be lifted in other way, may be due to his greater body weight.

2) Read the paragraph and answer the questions given below:

Disasters can be properly different religions, regions and terrorism.

a) What are three broad areas of disasters?

Ans: Natural disasters, technological disasters and manmade disasters are three broad areas of disasters.

b) Which disasters cannot be controlled? Why?

Ans: Natural disasters cannot be controlled as they are due to natural phenomena beyond the human power to stop them.

c) Which type of disasters were very common in Western Maharashtra in recent times? Why?

Ans: Cloud bursting and floods were very common in Western Maharashtra caused due to climate change.

d) Give any one example of technological disaster that shook the entire India.

Ans: Bhopal gas tragedy that occurred in 1984 was a worst disaster that shook the entire India.

e) Which types of disasters can be controlled in order to lead happy, peaceful and secured life? How?

Ans: We have to control manmade disasters such as wars, riots, terrorism, etc. by having peaceful negotiations, respect for each human being and feeling of brotherhood among all.

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