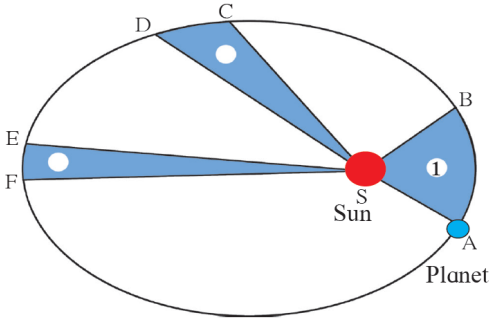
Q.3: Answer the Following. (3m each)

1) Observe the given figure and answer these following questions.



1.4 The orbit of a planet moving around the Sun.

a) What is the conclusion about the orbit of a planet?

b) What is the relation between velocity of the planet and distance from the sun.

c) ASB, CSD and ESF relation between areas explain.

1. Write Kepler's law.

2) State Newton's universal law of gravitation. Express it with the mathematical form of force of gravitation?

3) An object takes 5 s to reach the ground from a height of 5 m on a planet. What is the value of g on the planet?

4) The radius of planet A is half the radius of planet B. If the mass of A is MA, what must be the mass of B so that the value of g on B is half that of its value on A?

5) The mass and weight of an object on earth are 5 kg and 49 N respectively. What will be their values on the moon? Assume that the acceleration due to gravity on the moon is 1/6th of that on the earth.

6) An object thrown vertically upwards reaches a height of 500 m. What was its initial velocity? How long will the object take to come back to the earth? Assume g = 10

7) A ball falls off a table and reaches the ground in 1 s. Assuming g = 10 m/s^2, calculate its speed on reaching the ground and the height of the table?

8) The masses of the earth and moon are 6×10^{24} kg and 7.4×10^{22} kg, respectively. The distance between them is 3.84×10^5 km. Calculate the gravitational force of attraction between the two? (Use G = 6.7×10^{-11} N m^2/kg^2)

9) The mass of the earth is 6×10^{24} kg. The distance between the earth and the Sun is 1.5×10^{11} m. If the gravitational force between the two is 3.5×10^{22} N, what is the mass of the Sun? Use G = 6.7×10^{-11} N m^2kg^{-2}.

10) A tennis ball is thrown up and reaches a height of 4.05 m before coming down. What was its initial velocity? How much total time will it take to come down? Assume g = 10 m/s^2?

a) State mendeleev's periodic law. On which basis mendeleev organised periodic law?

b) State limitations of Dobereiner's law of triads?

c) Describe the merits of Mendeleev's periodic table?

d) What are the demerits of Mendeleev's periodic table?

e) Write name of elements, symbol, atomic number, electronic configuration of second period in modern periodic tables?

11) Write information about the given atomic number in the table.

Atomic Number	Electronic configuration	Groups	Periods	Elements
10				
20				
7				

12) An X element with atomic number 11 and Y element with atomic number 13 belong to the third period in the modern periodic table with this information given in the answers of the below question.

a) Which elements are more metallic characters from these two elements?

b) what is the valency of X व Y elements?

c) atoms size of Y element is smaller than atoms size of X element? explain?

13) Identify periods of elements and blocks of elements from given electronic configuration.?

a) 2, 8, 2 b) 2, 8, 7 c) 2, 1

14) Position of A, B and C three elements is given in the table from the modern periodic table. Answer the following questions?

Periods	Group 2	Group 17
2	------	A
3	B	-------
4	-------	C

a) What is an element metal or nonmetals?

b) Which is the outermost orbit of element B ?

c) Identify the C element and its physical state?

15) 3, 1, 2 electrons are in the valence shell of X , Y , Z elements resp. From this information write the name of the groups it belongs to and its valency.

16) Match the columns.

	Reactants	Products	Types of chemical reaction
a)			
b)	MgH_2	$\rightarrow$ $Mg + H_2$	Endothermic
c)	$2H_2S + SO_2$	$\rightarrow$ $3S + 2H_2O$	Oxidation
d)	$CaO + H_2O$	$\rightarrow$ $Ca(OH)_2$ + heat	Exothermic
			Redox

17) Write three steps of writing chemical equations with an example?

18) Identify the following reactions the reactants undergo oxidation and reduction.and write it?

a) $2Ag_2O \rightarrow 4Ag + O_2$

b) $2Mg + O_2 \rightarrow 2MgO$

c) $NiO + H_2 \rightarrow Ni + H_2O$

19) Answer the following questions

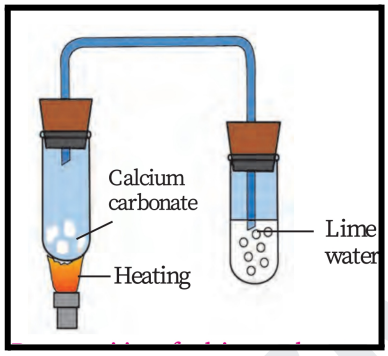
a) What is corrosion?

b) What is Electrolysis?

c)which changes occur during chemical changes?

d) what is called the reaction which involves oxidation and reductions simultaneously? explain with one example?

20) Explain the reaction given in figure?



21) Write the properties of Groups and Period.

22) Write the electron configuration and determine the valency of the beryllium -atomic number 4 and oxygen - atomic number 8.

23) Name any three appliances based on the heating effect of electric current.

24) Name any three appliances based on the magnetic effect of electric current Write laws

a. Fleming right hand rule

b. Fleming left hand rule

c. Right hand thumb rule

25) An electrical iron 1100 wt is operated for 2 hours daily what will be the electrical expenses for that in the month of April (the electrical charges 5 Rs. per unit of energy)

26) What is overloading? When does it occur? What does it cause? How can overloading be avoided?

27) Explain the construction and working of electric motors in short.

28) Write a short note on the galvanometer.

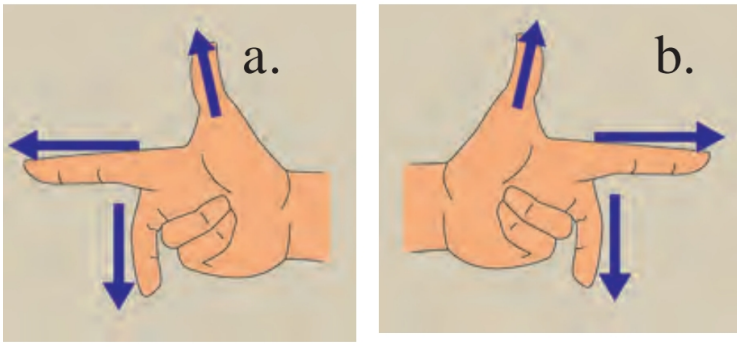
29) "Rate of reaction is also important from an environmental point of view." Illustrate this statement with an example.

30) What is the use of earthing wire?

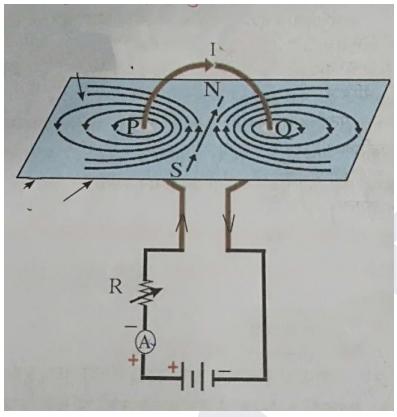
31) Explain the application of the heating effect of electric current in an electric bulb with a diagram.

32) Draw a neat labelled diagram to show the magnetic effect of electric current.

33) Name the following diagrams and explain the concept behind them.



34) Identify the given figure, write the labels of it.



35) Who will spend more electrical energy? 500 W TV Set in 30 mins, or 600 W heater in 20 mins?

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

37) decide the unit for specific heat capacity.

38) In cold regions in winter, the rocks crack due to anomalous expansion of water Explain term.

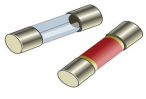
39) Explain how the heat capacity of a solid can be determined by the method of mixture.

40) What is meant by latent heat? How will the state of matter transform if latent heat is given off?

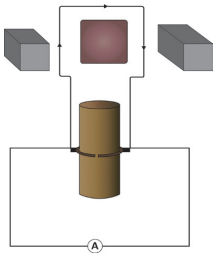
41) What is the role of anomalous behaviour of water in preserving aquatic life in regions of cold climate?

42) How can you relate the formation of water droplets on the outer surface of a bottle taken out of the refrigerator with formation of dew?

43) Identify diagrams and explain their uses.

a. 

b. 

c. 

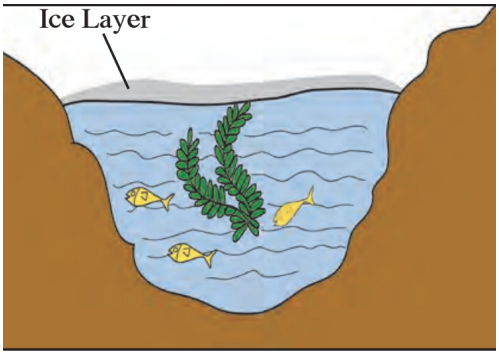
44) 'Geeta observed white trail at the back of the aeroplane in a clear sky to answer the question from this incident given below.

i) what will be the effect of relative humidity of the air surrounding the plane?

ii) what will be the effect of relative humidity if the air surrounding the plane is low?

iii) when the air is dry and humid?

45) Observe the given picture and answer the following questions.



a) Which property do you understand in this picture?

b) what is the temperature of the water at the surface?

c) what is the temperature below the layer of ice on the surface?

46) Read this activity and answer the following questions.

1) Take three spheres of iron, copper and lead of equal mass.

2) Put all the three spheres in boiling water in the beaker for some time.

3) Take the three spheres out of the water.

4) All the spheres will be at temperature 100°C

5) Put them immediately on the thick slab of wax

6) Note, the depth that each of the sphere goes into the wax

Que:

a) which property is determined from this activity?

b) give name to that property.

c) explain the term Principal of heat exchange with the help of this activity.

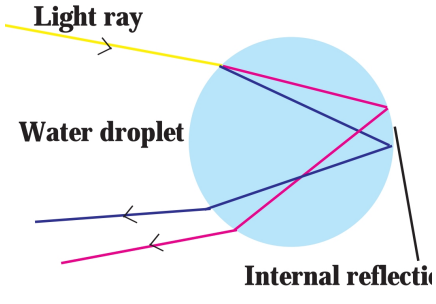
47) The cold object the hot object enclosed in a one box of heat resistant material

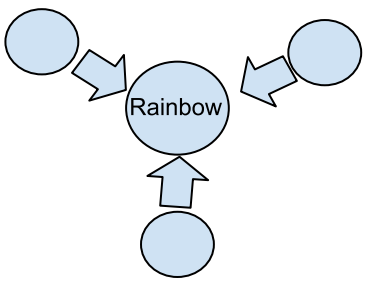
a) what changes will occur in the two objects when temperature flows from those objects ?

b)which principle can show that the energy exchange takes place between two objects only?

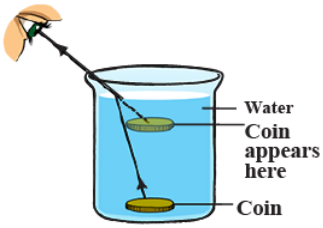
48) Rainbow is a beautiful natural phenomenon. It is the combined effect of a natural three processes together produced by light.write it into the circle.

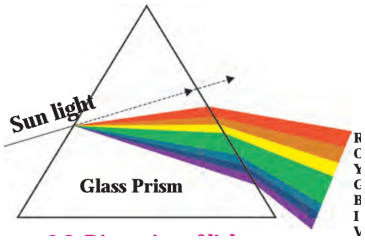
49)



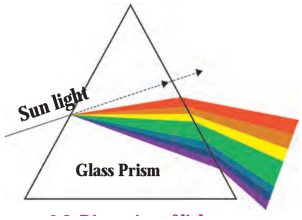


50) Observe the given figure and write appropriate phenomena of light in the box.





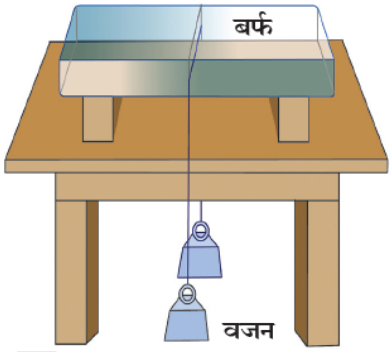
51) Observe the given figure and answer the following questions.



a. Which colour light rays bends most?
b. Which colour light rays bends least.
c. What is the wavelength of violet light rays?

52) Find the power of a convex lense of focal length of + 25 c.m

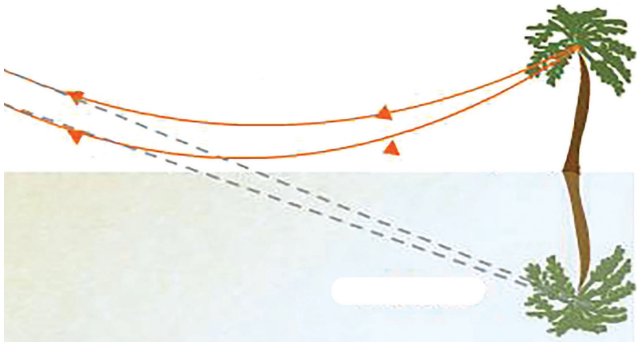
53) Identify the process shown in the diagram and explain in brief.



54) If a convex lens focal length is 20 c.m at what is the power of the lens?

55) If each two concave lenses of focal length 30 c.m are kept in contact with each other what will be the power of combination.

56) Write the name of the phenomenon shown in the diagram and briefly explain it.



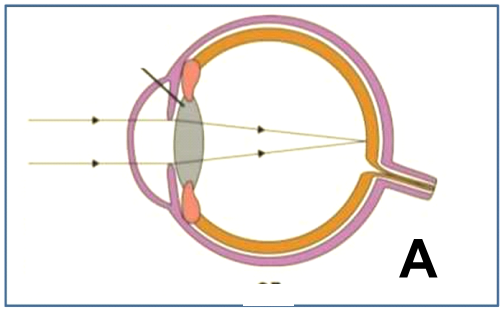
57) An object is placed at a distance of 10 c.m a convex lens of focal length 12 c.m found at what distance the object placed from the lens. position and nature of image

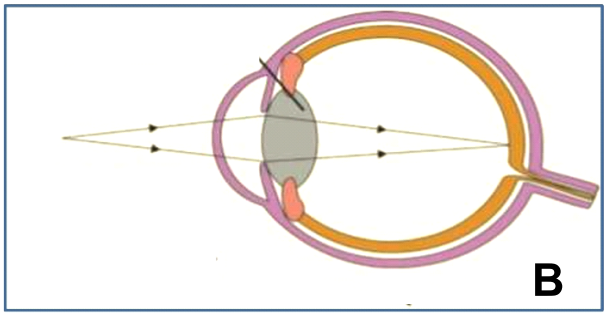
58) A 5 cm high object is placed at a distance of 20 cm from a converging lens of focal length of 10 cm. Determine the position, size and type of the image.

59) An object is placed vertically at a distance of 20 cm from a convex lens. If the height of the object is 5 cm and the focal length of the lens is 10 cm, what will be the position, size and nature of the image? how much bigger as compared to the object?

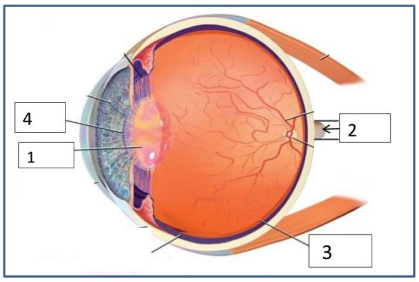
60) Two convex lenses of focal length 30 c.m and 10 c.m each are kept in contact with each other. Find the power of their combination.

61) In the following figure the change in the shape of the lens while seeing distant and nearby objects completes the figure by correctly labelled diagram .

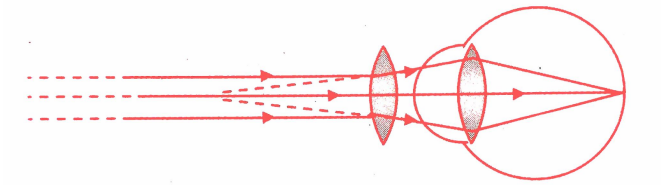




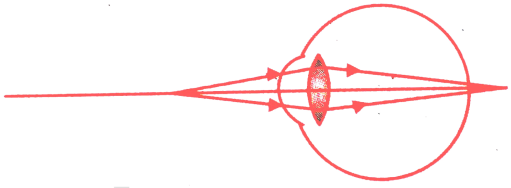
62) Write the function of the human eye and label parts of the figure given below.



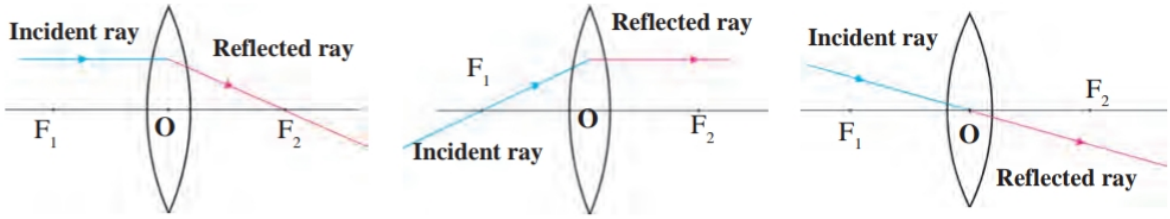
63) Observe the given below figure, correct it and explain and write about what is your concept about this figure.



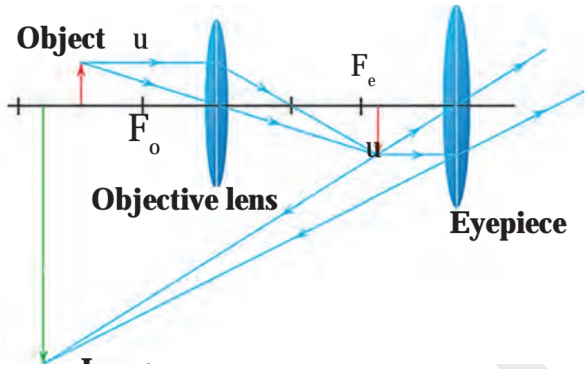
64) Given below is Diagram showing a defect of vision.name the defect of vision and draw an accurate labelled diagram to correct this defect.



65) Write laws in given figure.



66) Observe the given figure and answer the following questions.

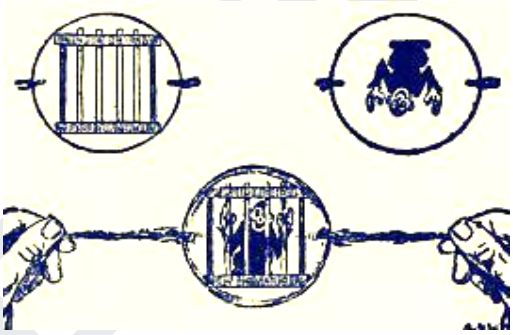


a) Where are the above types of lens construction used?

b) What type of image is formed by an objective lens?

e) What happens instead of placing at Fo if the object is placed in between O and FO?

67) Identify and Explain concepts given in this Diagram?



68) Complete paragraph by choosing the right options given below.

(Minimum, near point, 25 cm, farthest, farthest distance)

The …… distance of an object from a normal eye, at which it is clearly visible without stress on the eye, is called the minimum distance of distinct vision. The position of the object at this distance is called the …… of the eye, for a normal human eye, the near point is at ……. The ……. distance of an object from a human eye, at which it is clearly visible without stress on the eye is called …….. of distinct vision. The position of the object at this distance is called the …….. of the eye.

69) Choose the correct option from the bracket and complete the stanza.

(Colour blind, actual, conical, light sensitive, rodlike, colours)

The retina in our eyes is made up of many --------- cells. These cells are shaped like a rod and like a cone.The ------- cells respond to the intensity of light and give information about the brightness or dimness of the object to the brain.The

---------- cells respond to the colour and give information about the colour of the object to the brain.Brain processes all the information received and we see the ------ image of the object.Rod like cells respond to the faint light also but ------ cells do not.Some people lack conical cells responding to certain colours. These persons can not recognize those colours or can not distinguish between different ---------.These persons are said to be --------.

A) What is corrosion ?

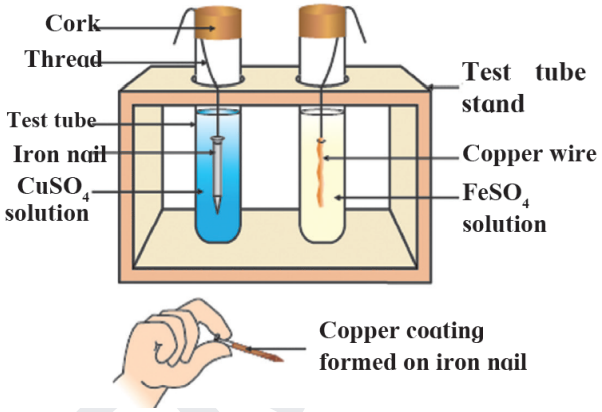
B) Write the chemical name of Corrosion.

C) Write a molecular formula for corrosion.

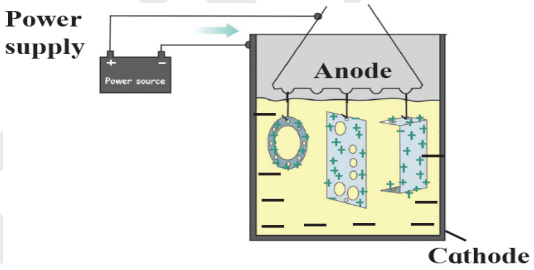
70) Explain the Cartesian sign convention used for the lens.

71) Write the uses of concave lenses.

72) Observe the following diagram and identify the type of reaction and write observation.



73) Observe the following diagram and give answers.



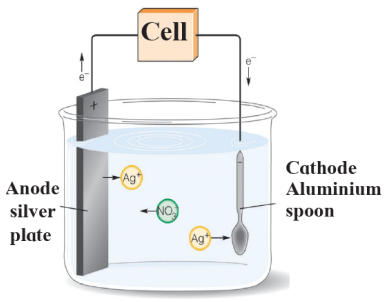
A) Name the method of prevention of corrosion.

B) For prevention of which metal this method is used?

C) What is used as Anode in this method?

74) Explain the Hydraulic separation method with a neat labelled diagram.

75) Observe the following diagram and write answers.

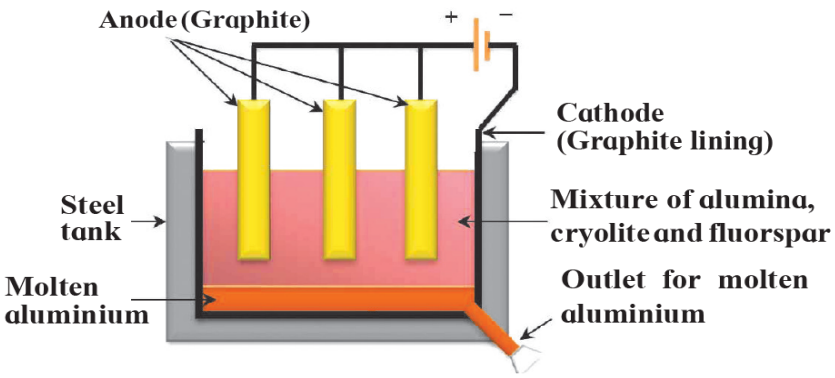


A) Name the method :----------

B) Explain the method .

C) Give two examples of this method.

76) Observe the following diagram and write answers.

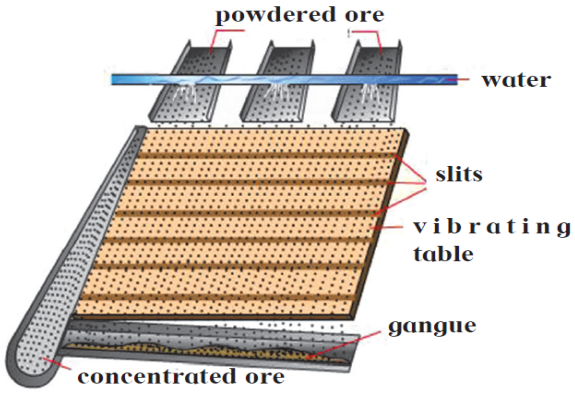


A) Name the method :----------

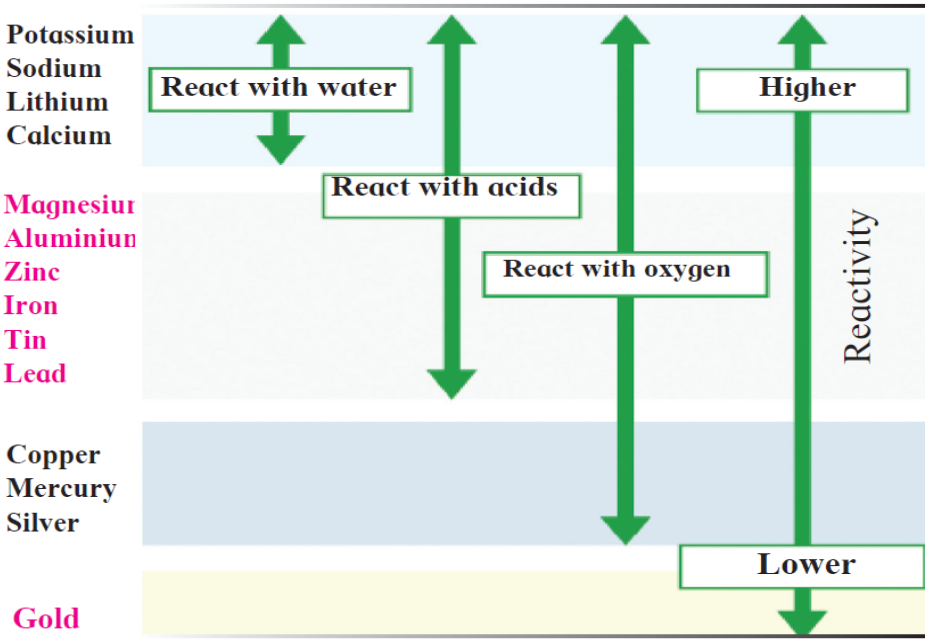
B) Write Anode reaction and Cathode reaction .

C) Why are fluorspar and cryolite added in the mixture ?

77) Identify the following method of concentration of ores and explain briefly .



78) Observe the following diagram and write answers.



A) Write the name of two metals which react with water.

B) Write the name of two moderately reactive metals .

C) Which is highly reactive and less reactive metal?

79) Explain the Froth floatation method with a neat labelled diagram.

80) Read the following passage and answer the questions.

According to the reactivity series Zinc is more reactive than Iron, Iron is more reactive than silver. During study of this a student deeped the iron nails in silver nitrate solution.

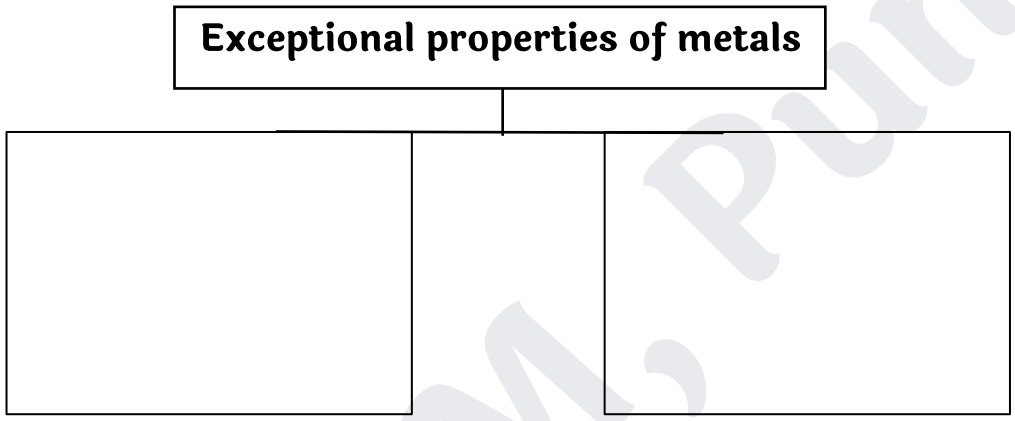
A. What is reactivity ?

B. What will happen when iron nails are dipped in silver nitrate solution ?

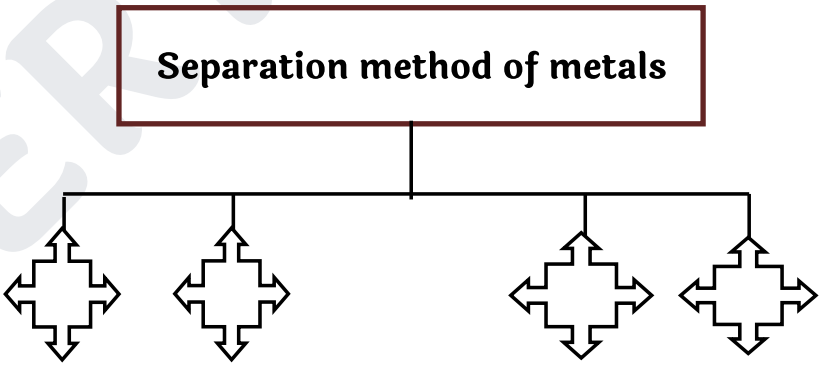
C. Which type of reaction happens when iron metal reacts with silver nitrate solution ?

D. What will happen if a Zinc rod is used other than Iron nail ?

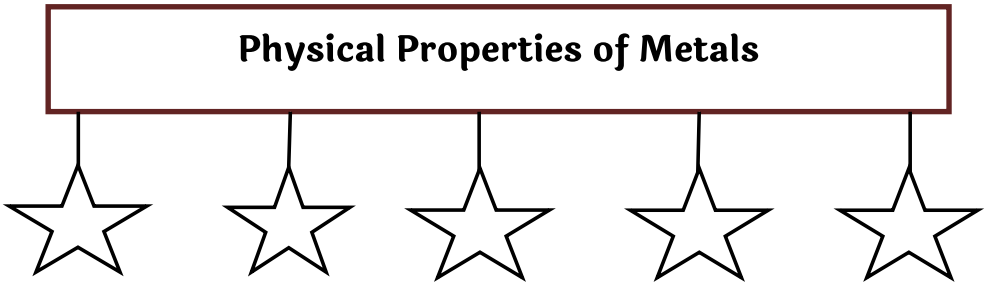
81) Complete the following flowchart.



82) Complete the following flowchart.



83) Complete the following flowchart.



84) Homologous series of Alkanes.

Name	Molecular formula	Condensed Structural formula	Number of carbon atoms	Number of $-CH_2-$ units	Boiling point ^0C
Methane	CH_4	CH_4	1	1	- 162
Ethane	C_2H_6	CH_3-CH_3	2	2	- 88.5
Propane	C_3H_8	$CH_3-CH_2-CH_3$	3	3	- 42
Butane	C_4H_{10}	$CH_3-CH_2-CH_2-CH_3$	...	...	0
Pentane	C_5H_{12}	$CH_3-CH_2-CH_2-CH_2-CH_3$	...	...	36
Hexane	C_6H_{14}	$CH_3-CH_2-CH_2-CH_2-CH_2-CH_3$	...	...	69

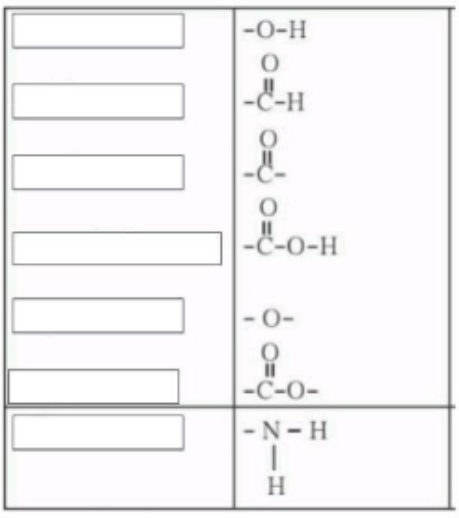
85) Homologous series of Alcohols

Name	Molecular formula	Condensed Structural formula	Number of carbon atoms	Number of $-CH_2-$ units	Boiling point ^0C
Methanol	CH_4O	CH_3-OH	1	1	63
Ethanol	C_2H_6O	CH_3-CH_2-OH	2	2	78
Propanol	C_3H_8O	$CH_3-CH_2-CH_2-OH$	...	...	97
Butanol	$C_4H_{10}O$	$CH_3-CH_2-CH_2-CH_2-OH$	...	...	118

86) Homologous series of Alkenes

Name	Molecular formula	Condensed Structural formula	Number of carbon atoms	Number of $-CH_2-$ units	Boiling point ^0C
Ethene	C_2H_4	$CH_2= CH_2$	2	0	- 102
Propene	C_3H_6	$CH_3-CH=CH_2$	3	1	- 48
1-Butene	C_4H_8	$CH_3-CH_2-CH=CH_2$	...	...	- 6.5
1-Pentene	C_5H_{10}	$CH_3-CH_2-CH_2-CH=CH_2$	...	...	30

87) Complete the given chart with writing the correct functional group of carbon compounds. (Ester, Aldehyde, Ketone, Carboxylic acid, Alcohol,Ether)



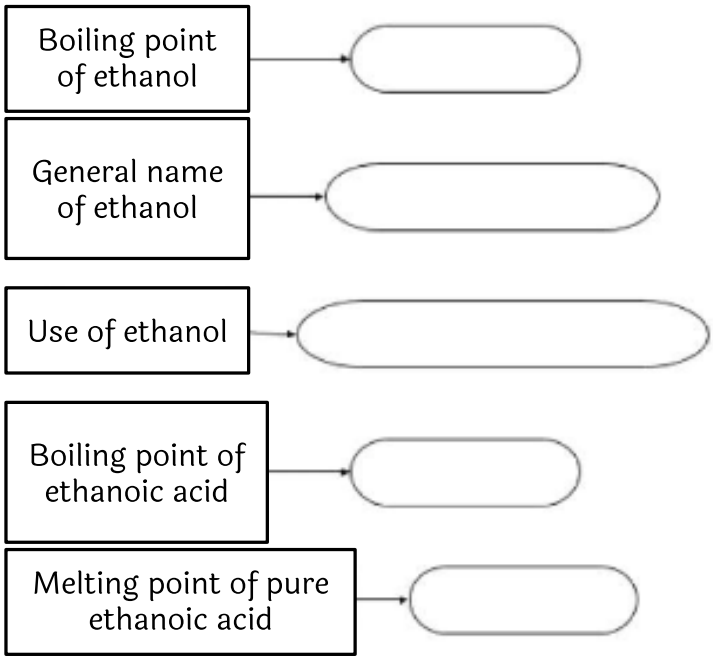
88) Complete the following table with writing correct structural formula and molecular formula.

Straight chain of carbon atoms	Structural formula	Molecular formula	Name
C – C	……	……	Ethane
C – C – C – C	……	……	Butane
C – C – C – C– C– C– C	……	C_7H_{16}	……
C – C – C – C– C– C– C – C	……	C_8H_{18}	……

89) Complete the following table with writing IUPAC name of carbon compound.

Sr. No.	Common name	Structural formula	IUPAC Name
1	ethylene	$CH_2=CH_2$	
2	acetylene	$HC\equiv CH$	
3	acetic acid	CH_3-COOH	
4	methyl alcohol	CH_3-OH	
5	ethyl alcohol	CH_3-CH_2-OH	
6	acetaldehyde	CH_3-CHO	
7	acetone	CH_3-CO-CH_3	
8	ethyl methyl ketone	CH_3-CO-CH_2- CH_3	
9	ethyl amine	CH_3-CH_2-NH_2	
10	n-propyl chloride	CH_3- CH-CH_2-Cl	

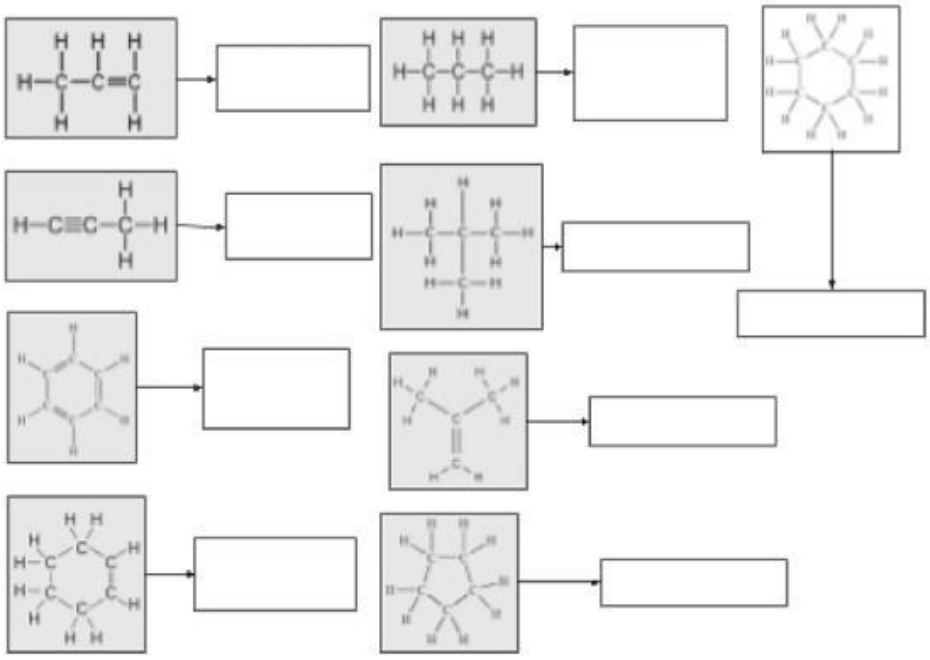
90) Complete the following activity.



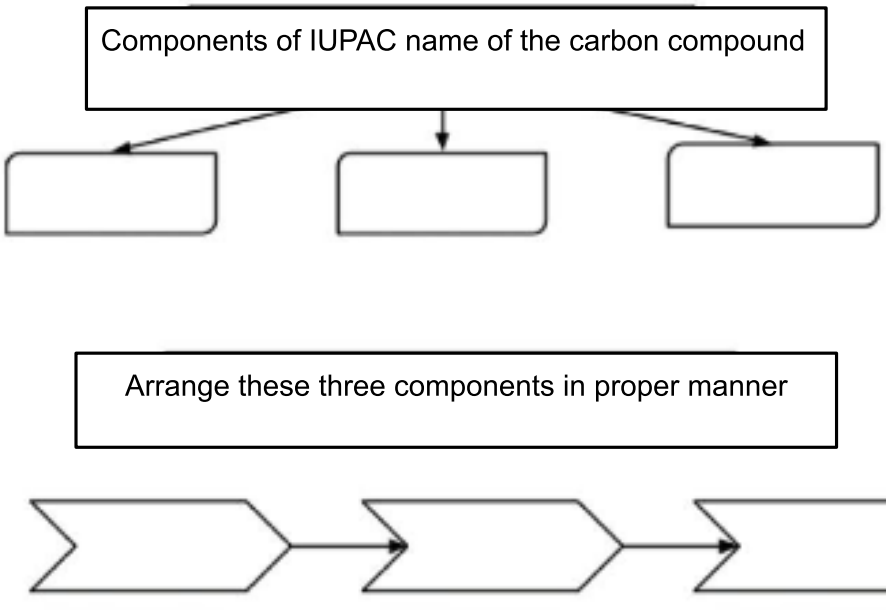
91) Complete the following activity.

Write the names of the hydrocarbons for the following structural formula.

(Isobutylene, cyclohexane, propene, cyclohexene, cyclopentane, benzene, propyne, isobutane, propene)

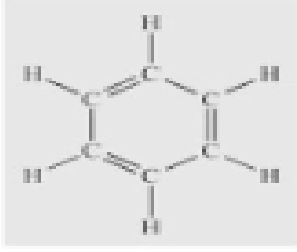


92) Complete the following activity.



93) Observe the structural formula and answer the following questions.

1. Write the name of the given hydrocarbon.
2. The given hydrocarbon included in which type of hydrocarbon?
3. What kind of compounds with the above characteristic structure are called?



94) Complete the following chart by using examples given in brackets.
(isobutylene, cyclohexane, propene, cyclohexene, cyclopentane, benzene, propyne, isobutane, propene)

Straight Chain Hydrocarbons	Branched chain Hydrocarbons	Cyclic Hydrocarbon

95) Write the properties of Ionic compounds.

96) The molecular formula of chlorine is Cl_2. Draw the electron-dot structure and line structure of a chlorine molecule.

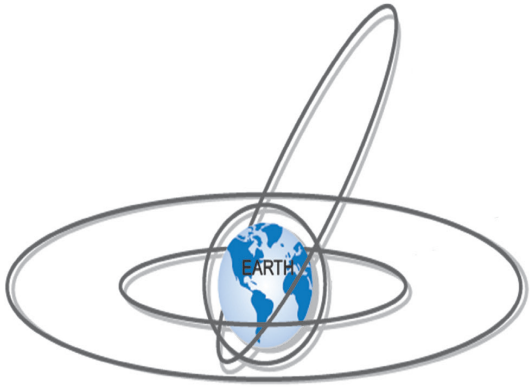
97) Molecular formula of water is H_2O. Draw the electron-dot structure and line structure of this triatomic molecule. (Use dots for electrons in oxygen atoms and cross for electrons in hydrogen atoms.)

98) The molecular formula of ammonia is NH_3. Draw the electron-dot structure and line structure for ammonia.

99) Draw the electron-dot structure of cyclohexane.

100) Name three natural polynomials and write where they are found and from which monomer they are made.

101) What is vinegar and gasoline? What are their uses?
Observe the figure and write the answers.



A) Name the outer orbit.
B) Which satellites revolve in low earth orbits?
C) Which various orbits are given in the figure?
D) Give an example of a launch vehicle based on Newton's third law.

102) Explain why spacecraft take longer to reach the moon than light?

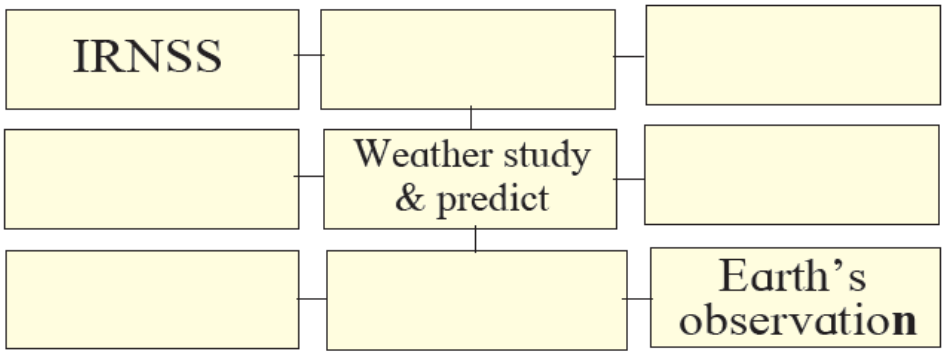
103) Write functions of Military satellite and Navigational satellite.

104) What is meant by Artificial satellite ? How are they classified depending on their functions?

105) If the 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?

106) Explain : Escape velocity on the moon is less than escape velocity on the earth.

107) Complete the following chart.



Question no. 4 : Answer the following questions. (5 Marks each)

1) Read the given passage carefully and answer the questions.

We know that the gravitational force of the earth is applied to all objects. This force was used even when you were holding a stone in your hand. But the force you were pushing in the opposite direction with your hand was balancing it so that the stone was stable.When you let go of the hand ,only gravitational force is applied to the stone, so the stone falls under its influence. When an object is moving only under the influence of gravitational motion, that motion is called free fall,that is the stone falls. In free fall,the initial velocity is zero and it is increased due to gravitational acceleration over time.At the time of free fall on the earth , the friction of the air opposes the motion of the object. So in the true sense free fall cannot happen in the air. It can happen only in vacuum.

A) Complete the following statement by choosing the right option.

The stone held in the hand is stable because, on it ....

a) two unbalanced forces are exerted.

b) only the gravitational force of the earth is exerted.

c) gravitational force of the earth is not exerted.

d) two balanced forces are exerted.

B) Why does free fall not happen on the earth?

C)Why does the velocity of the object increase during the free fall?

D)Which type of force exerts on the object during free fall?

E) Why does free fall happen only in vacuum?