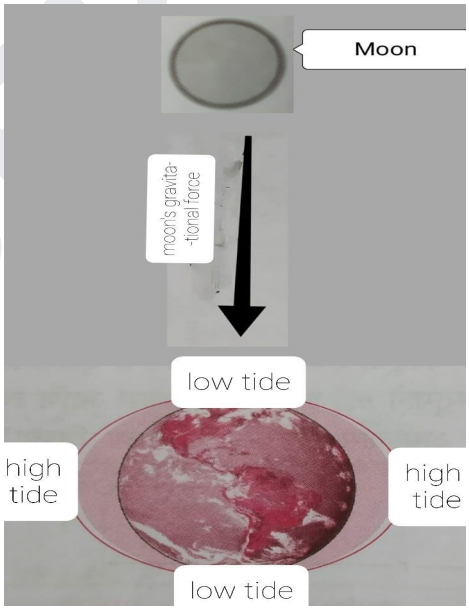
69. Vegetable ghee is formed from the hydrogenation of vegetable oil in presence of nickel catalyst.
70. Carbon has the property of forming many compounds.
71. Benzene compounds are called aromatic compounds.
72. The velocity at the earth's surface must be greater than the escape velocity of the earth.
73. Space debris can be harmful to the artificial satellites.
74. Satellite launch vehicles are used to place satellites in their specific orbits.
75. The launch vehicles are very costly.

Q.2 (B) Solve the following Questions. (Each 2 Marks)

1. Complete the following chart regarding the weight and mass of an object.

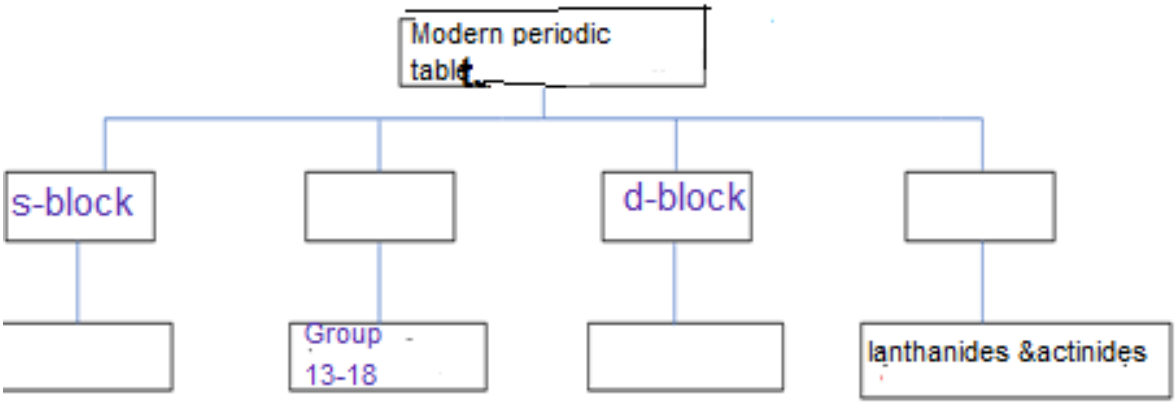
Object	On Earth	On moon
Mass	X	.....
Weight	.....	Y

2. State Newton's Universal Law of Gravitation.
3. Define acceleration due to gravity. Write its value on the surface of Earth.
4. If a person weighs 750 N on Earth, what will be the weight of the person on the moon? (The mass of moon is $\frac{1}{81}$ times the mass earth and its radius are $\frac{1}{3.7}$ times that of earth.)
5. Mahendra and Virat are sitting at a distance of 1m from each other. Their masses are 75 Kg and 80 Kg respectively. What is the gravitational force between them?
   ($G = 6.67 \times 10^{-11}\ Nm^2/kg^2$)
6. Identify the mistake in the given diagram and draw it again.

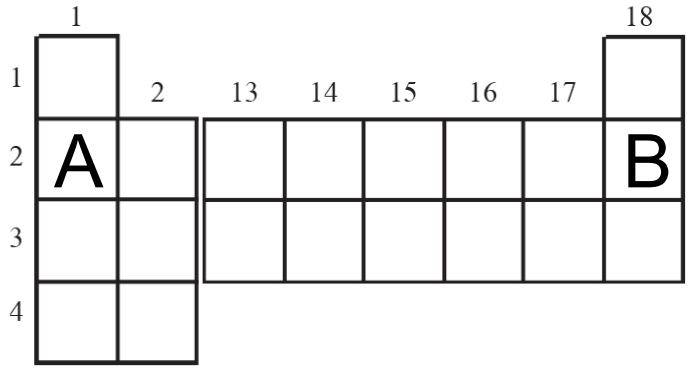


7. The mass of planet 'X" is four times that of the earth and its radius is double the radius of the earth. The escape velocity of a body from the earth is 11.2×10^3 m/s. Find the escape velocity of a body from the planet 'X'.

8. If a stone and a piece of wood are dropped simultaneously from a height in vacuum, which object will reach the ground first? Why?
9. Will the mass and weight of an object on Earth be the same on Mars? Why?
10. State the following.
    a) Doberenier's law of Triads
    b) Newland's Law of Octaves
    c) Mendeleev's Periodic Law
    d) Modern Periodic Law
11. Complete the following flow chart.



12. In the modern periodic table, the positions of 1 to 20 elements are shown here. Identify the elements A and B. Write their atomic number.



13. Some elements and their atomic radii are given here. Arrange them in a decreasing order of their atomic radii. Identify which of the above elements is the biggest atom and which is smallest?

Element	K	Na	Rb	Cs	Li
Atomic radius(pm)	231	186	244	262	151

14. Complete the following chart.

Shell	n	$2n^2$	Electron Holding Capacity
K		2×1^2	2
L	2		8
	3	2×3^2	18
N	4	2×4^2	

15. Find the period in which these elements can be placed.

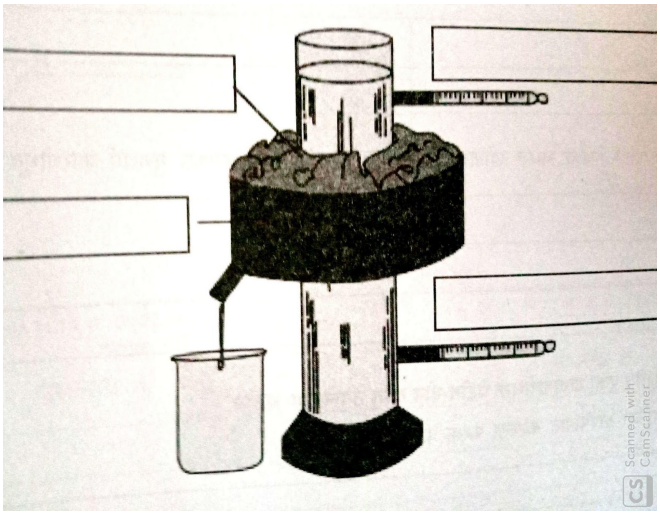
$_{4}Be$, $_{17}Cl$, $_{2}He$, $_{13}Al$

16. Electronic configuration of element A is 2,8,1. Answer the following questions based on this information.
    a) What is the atomic number of element A?
    b) Find the group to which this element belongs.
17. Classify the following elements into Metals and Nonmetals.
18. S, Mg, Al, P, N, Na.
19. Explain the factors affecting the rate of chemical reaction with examples.
20. What are reactants and products? Explain with the help of examples.
21. Explain the following reaction with their balanced chemical equation .
    a) Ammonia gas reacts with hydrogen chloride.
    b) hydrogen sulphide reacts with sulphur dioxide.
22. Classify the following reactions into Exothermic and Endothermic reactions.
    a) Magnesium ribbon when burned in air, it forms magnesium oxide.
    b) $HCl + NaOH \rightarrow NaCl + H_2O$ + Heat
    c) $2KClO_{3(s)} \xrightarrow{\triangle} 2KCl_{(s)} + 3O_2$
    d) $CaO + H_2O \rightarrow Ca(OH)_2$ + Heat
    e) $CaCO_{3(s)} \xrightarrow{\triangle} CaO_{(s)} + CO_2$
23. Identify which is the oxidising agent and reducing agent in the following reaction.

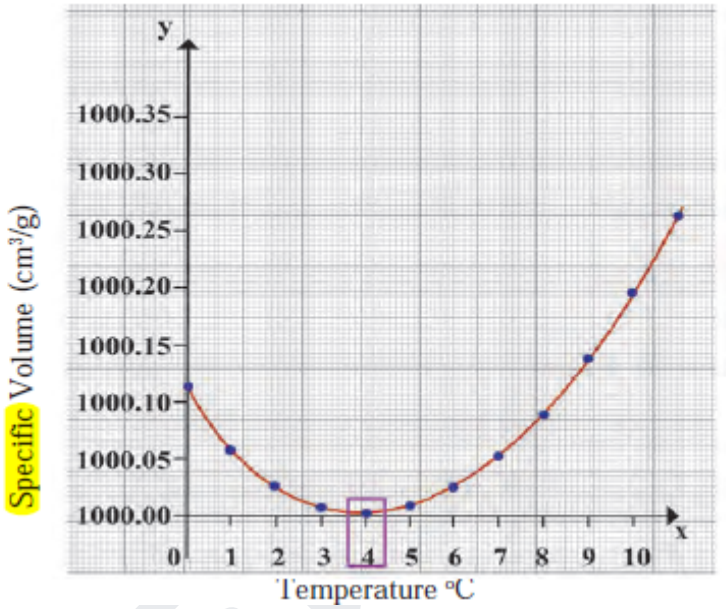
$$2H_2S + SO_2 \longrightarrow 3S\downarrow + 2H_2O$$

24. Write the similarities and differences between the reactions of NaOH in water and CaO in water.
25. Distinguish between Direct current and alternating current.
26. How does the short circuit form? What is its effect?
27. Write Fleming's Right hand rule and Left-hand rule.
28. What is an electric motor? In which appliances do we use it?
29. Name any two appliances which work on the phenomenon of magnetic effect of electric current.
30. Name any two appliances which work on the phenomenon of heating effect of electric current.
31. Explain the Right-hand thumb rule with the help of a diagram.
32. Explain the importance of fuse wire. (Uses)
33. Draw a neat and labelled diagram of Hope's apparatus.
34. How much heat will be required to raise the temperature of 5kg of water from 20℃to100℃?
35. Find the amount of heat needed to raise the temperature of a silver container of mass 100g by 10℃.(c=0.056cal/g℃)
36. If water of mass 60g and temperature 60℃is mixed with water of mass 60g and temperature 40℃, what will be the maximum temperature of the mixture?

37. Label the following diagram appropriately.



38. Observe the following diagram and write the answers to the questions given below.

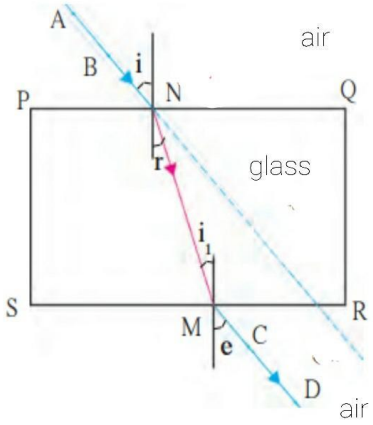


a) Which process does the graph represent?

b) What is the range of temperature responsible for the behaviour?

39. Find the amount of needed to raise the temperature of a piece of iron of mass 500gby 20℃.(c=0.110cal/g.℃)
40. If the absolute refractive index of water is 1.36, find the speed of light in water.(Speed of light in vacuum=3×10^8 m/s.
41. If the absolute refractive index of glass and water are 3/2 and 4/3 respectively, what is the refractive index of glass with respect to water?
42. Velocity of light in first medium, $V_1=3\times10^8$ m/s and in second medium, $V_2 = 2\times10^8$m/s, Then ${}_2n_1$ = ?
43. Draw a neat and labelled diagram for Dispersion of light.
44. What is refraction of light? Explain with the help of example.
45. What is meant by dispersion of light?
46. State the laws of refraction of light.

47. If the speed of light in a medium is 1.5×10^8 m/s, what is the absolute refractive index of the medium?
48. Observe the given figure and name the following.



Ray AB ☐

Ray NM ☐

Ray MD ☐

∠ r ☐

49. When a copper coin is dipped in the solution of silver nitrate, it shows a lustre on its surface.explain this process with the help of a chemical equation.
50. Electronic configuration of metal A is 2,8,1. Electronic configuration of Metal B is 2,8,8,2.Which of the above metals is more reactive?Explain with reason.
51. Classify the following metals based on their reactivity.
52. Cu, Zn, Ca, Mg, Fe, Na, Li, Hg

More reactive	Moderately reactive	Less reactive

53. Write the molecular formulas of the following compounds.
    a)Cryolite
    b)Fluorspar
    c)Sodium aluminate
    d)Copper pyrite
    e)Stannic oxide
    f)Ferrous tungstate
54. Explain the concept of Roasting and Calcination.
55. a)What is an alloy?
    b)Give two examples of alloy.
56. Explain Bayer's process.
57. Differentiate between Calcination and Roasting.
58. Draw a neat and labelled diagram for the Froth Floatation Process.

59. Explain the reactions of nonmetals with water with the help of examples.
60. Explain the characteristics of Ionic compounds.
61. What are amphoteric oxides ? Explain with the examples.
62. Explain the Catenation power.
63. Explain the characteristics of covalent bonds.
64. Explain the term Structural isomerism with an example.
65. Explain the following terms with an example.
66. a) Oxidising agent b) Reduction
    Explain the concept of heteroatoms with the help of examples.
67. Explain the following reactions with examples.
    a) Addition reaction b) Substitution reaction c) Esterification d) Saponification
68. What are catalysts? Give a chemical reaction in which a catalyst is used.
69. Write the characteristics of Ethanol.
70. What are vinegar and gasoline? What are their uses?
71. Write the uses of ethanol.
72. Write the characteristics of ethanoic acid.
73. What is meant by space debris? Suggest the ways to manage space debris.
74. Bring out the contribution of India's space missions.
75. What is Medium Earth Orbit?
76. Calculate the critical velocity of the satellite to be located at 35780 Km above the surface of earth.

Question 2 b) II. Distinguish between:

1. Universal gravitational constant - Gravitational acceleration of the earth
2. Weight and mass
3. Group - Period
4. s-block - p- block
5. Group 17 - group 18
6. Mendeleev's periodic table - Modern periodic table
7. Concave lens - Convex lens
8. Farsightedness- Nearsightedness
9. Myopia - Presbyopia
10. Metals - Nonmetals (physical characteristics)
11. Roasting - Calcination
12. Froth floatation - Leaching
13. Saturated hydrocarbons - Unsaturated hydrocarbons
14. Open chain hydrocarbons - closed chain hydrocarbons
15. Alkane - Alkene
16. High Earth orbit - Medium Earth orbit.

Que 2B) III. write short notes. (2m each)

1. Escape Velocity
2. Free Fall
3. Anomalous behaviour
4. Specific capacity
5. dew point temperature
6. regelation
7. Aqua Regia
8. catenation power
9. characteristics of carbon
10. functional group carbon compounds
11. Homologous series
12. aromatic hydrocarbons
13. Macromolecules
14. Alcohol – a fuel
15. Mars missions
16. moon missions
17. Need and importance of space missions

Que 2B) IV. Explain the following reactions with the balanced equations. (2 marks each).

1. sodium burns in air
2. reaction of aluminium with oxygen
3. magnesium reacts with dil. HCl
4. aluminium reacts with dil. hydrochloric acid
5. reaction of zinc with dil. hydrochloric acid
6. Sulphur burns in air
7. chlorine dissolved in water
8. sodium aluminate reacts with water
9. ferrous dissolved in aqueous solution copper sulphate.
10. Ferric oxide is reacted with aluminium.
11. electrolysis of alumina is done.
12. dry aluminium hydroxide is ignited in at 1000°c
13. zinc oxide is heated strongly in excess of air
14. zinc carbonate is heated strongly in limited supply of air
15. zinc oxide is treated with carbon

Que 2 B) V. Explain concepts with examples / explain with the help of a balanced equation. (Each 2 m)

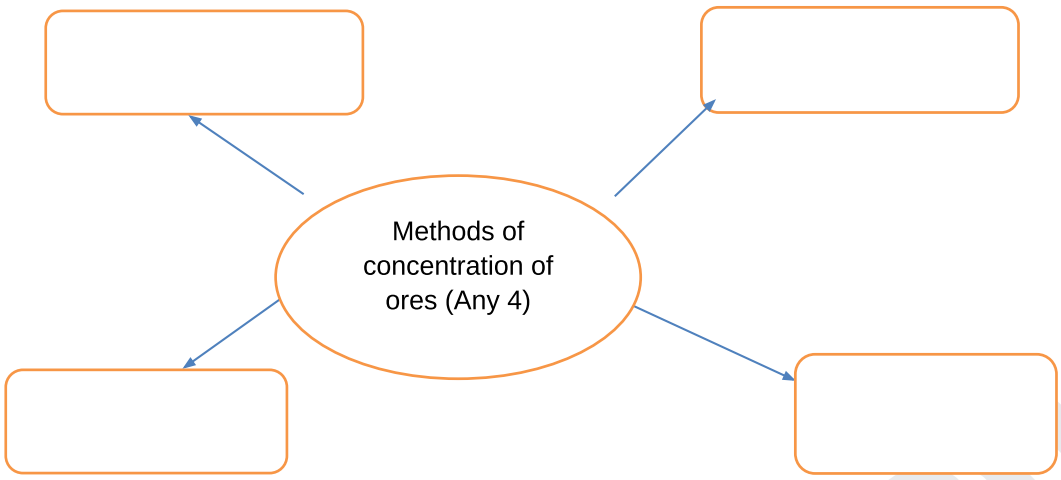
1. ionic bond and ionic compounds
2. ganauge
3. Ores
4. Roasting and calcination
5. corrosion
6. Minerals

Que.2 B) VI. Draw a neat labelled diagram. (2m each)

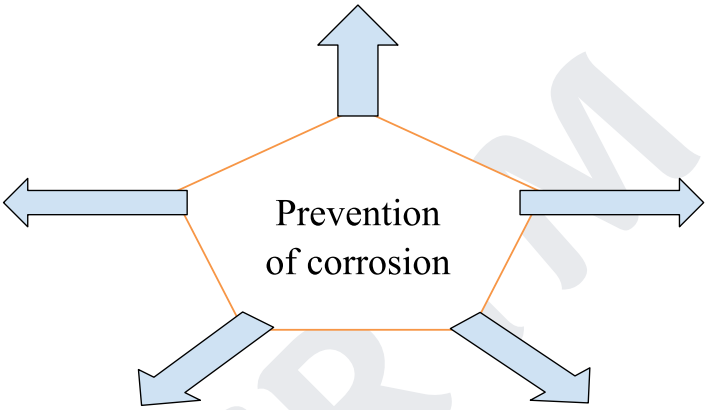
1. Magnetic separation method
2. Froth flotation
3. Electrolysis reduction of alumina
4. Hydraulic separation method
5. electrolysis
6. anodizing

Que 2 B) VII. Complete flow chart given below (2m each)

1)



2.



3) Symbol : ---------- Valency : ----------

Atomic Number: ---------- Electronic configuration: --------