MODEL QUESTION PAPER SET- 1 : 2021 - 22

STD 10TH – SCIENCE -I- (THEORY)

MM : 40 **SOLUTION** **Time : 2 Hrs**

ENTIRE SYLLABUS :

Q.1 A) Multiple Choice Questions (5)

1) b. Centre of the earth

2) d. The intensity of magnetic field in A is less than in B

3) d. All of the above

4) c. Newtons Third law of motion

5) d. All of the above

(B) Solve the following question (5)

1) Find the odd one out.

Fe + S → FeS, 2Mg + O_2 → 2 MgO, C + O_2 → CO_2, 2 Ag_2O → 4Ag + O_2 ↑

Ans. 2 Ag_2O→4 Ag + O_2↑ as it is decomposition reaction and rest all are combination reaction.

2) Find co-related terms

Minimum deviation : : : maximum deviation : violet light.

Ans. Minimum deviation : **Red light** : : maximum deviation : violet light.

3) Match the pair.

Column "A"	Column "B"
i. Microscope (Simple)	a. Correction of eye defect
ii. Concave mirror	b. Watch repairer
	c. Torches and head lights

Ans.

i. Microscope (Simple)	Watch repairer
ii. Concave mirror	Torches and head lights

4) State true or false.

Silver and gold react with dilute acids.

Ans. False - Silver and gold does not react with dilute acids.

5) Name the following

Write the name and symbol of the element from the description. The most reactive nonmetal.

Ans. Fluorine (F).

Q.2 A) Give scientific reason. (Any two) (4)

1) If the value of 'g' suddenly becomes twice its value, it will become two times more difficult to pull a heavy object along the floor.

Ans.

i. Weight of an object depends on the value of 'g' as it is the force acting on the mass of that object by gravitation pull.

ii. Weight is directly proportional to value of 'g', and this increase as 'g' increase.

iii. As the value of 'g' is doubled, the weight of the object increases by factor 2, making the object heavy.

iv. Therefore, as weight is doubled, it becomes two times harder to pull the heavy object across the floor.

2) The unsaturated compounds are more reactive than the saturated compounds.

Ans.

i. The valencies of all the carbon atoms in saturated hydrocarbons are fully satisfied by single bonds.

ii. Single bonds are very strong and hence remain less reactive.

iii. The carbon compounds having a double bond or triple bond between two carbon atoms are called unsaturated compounds.

iv. Double and triple bonds are comparatively weaker.

v. Therefore, The unsaturated compounds are more reactive than the saturated compounds.

3) Tungsten metal used to make solenoid type coil in an electric bulb.

Ans. Tungsten metal is used to make solenoid type coil in an electric bulb because :

i. Tungsten metal has high resistance and high melting point (nearly 3422^0C)

ii. Because of current it gets heated at high temperature and emits light.

iii. Because of the solenoid type coil the length of the tungsten filament increases there by increasing the resistance in the circuit

(B) Solve the following questions. (Any three) (6)

1) Define Radius of Curvature of lens.

Ans. The Radius of curvature of a lens is the radius of sphere of which the lens is a part.

2) Explain the similarity and difference in two events, namely adding NaOH to water and adding CaO to water.

Ans.

	Adding NaOH to water	**Adding CaO to water**
Similarity	Heat is given away during this process. So, it is an exothermic process.	Heat is given away during this reaction. So, it is an exothermic reaction.
Difference	No new substances are formed as the process involves only dissolution.	New substance (calcium hydroxide) is formed.

3) Two tungsten bulbs of power 50 W and 60 W work on 220 V potential difference. If they are connected in the main conductor, find the total current flowing to both the bulbs? Which bulb will consume more current?

Ans. For the first tungsten bulb

P_1 = 50W V_1 = 220 V

$$I_1 = \frac{P_1}{V_1} = \frac{50}{220} = 0.22A$$

For the second tungsten bulb

P_2 = 60W V_2 = 220 V

$$I_2 = \frac{P_2}{V_2} = \frac{60}{220} = 0.27A$$

When the bulbs are connected in parallel then current in main conductor.

$I = I_1 + I_2$

$I = 0.22A + 0.27A$

$= 0.49$ A

1) Name 4 substances whose Specific heat capacity is less than 1.

Ans. Iron, Paraffin, Mercury, Silver, Copper, Aluminium, Kerosene (any 4)

5)

Name	Molecular formula	Condensed Structural	Number of carbon atoms	Number of -CH_2units
Ethene	C_2H_4	$CH_2= CH_2$	.....	2
Propene	C_3H_6	CH_3-CH=CH_2	3	1
1-Butene	**C_4H_8**	CH_3-CH_2-CH=CH_2	**4**	**2**
1-Pentene	C_5H_{10}	**CH_3-CH_2-CH_2-CH=CH_2**	**5**	**3**

Q.3 Solve the following questions. (Any five) (15)

1) Complete the table :

Ans.

Terms	Units of Measurement
Universal gravitational constant	Nm^2/kg^2 or $Nm^2 \cdot kg^{-2}$
Weight	N or kgm/s^2
Mass	Kg
Velocity	m/s
Acceleration due to gravity	m/s^2
Time	s

2) Read the statements given below. Identify and write the concept upon which the given statement is based.

Ans.

i. A trial and error method.

ii. Law conservation of mass

iii. Electrolysis or electrolitic decomposition

iv. antioxidants

v. A redox reaction

vi. Silver Nitrate

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

Ans.

i. Rainbow is a beautiful natural phenomenon.

ii. It is a combined effect of a number of natural processes.

iii. The rainbow appears in the sky after a rain shower.

iv. The water droplets act as small prism.

v. When sunlight enter the water droplets present in the atmosphere, They refract and disperse the incident sunlight.

vi. Then they reflect it internally inside the droplet and finally again refract it.

vii. As a collective effect of all there phenomenon the seven coloured rainbow is formed.

4) On what basis and how are the orbits of artificial satellites classified?

Ans.

i) **Depending on the height of the satellite's orbit above the earth's surface, the satellite orbits are classified as below:**

High Earth Orbits (HEO)

a. **(Geosynchronous Satellites):** If the height of the satellite's orbit above earth's surface is greater than or equal to 35780 km, the orbit is called High earth orbits.

Medium Earth Orbit (MEO) :

b. **(Geostationary Satellites):** If the height of the satellite's orbit above the earth's surface is in between 2000 km and 35780 km, the orbits are called medium earth orbits.

Low Earth Orbit (LEO):

c. If the height of the satellite orbit above the earth's surface is in between 180 km and 2000 km, the orbits are called low earth orbits.

5) Observe the figure and answer the following questions.

Ans.

i. The instrument shown in figure is generator.

ii. This machine is used to generate electricity.

iii. The generator generates electricity through following transformations : Mechanical Energy → Electrical Energy

6) i. What is Iris ? ii. What is Pupil ? iii.What is retina ?

Ans.

i. Iris is the dark, fleshy screen behind the cornea of human eye. The colour of Iris is different for different people.

ii. A small hole of changing diameter at the centre of the iris is called pupil. Pupil controls the amount of light entering the eye.

iii. The retina is a light sensitive screen consisting of a delicate membrane with a large number of light sensitive cells.

7) Complete the paragraph:

Ans. The vapor content in the air is measured using a physical quantity called **absolute humidity**. The **mass** of vapor present in a unit volume of air is called absolute humidity. Generally absolute humidity is measured in **kg/m3**. The feeling of **humid or dry** nature of air not only depends on the amount of vapor in the air, but it also depends on how close that amount is for making the air **saturated** with vapor. It means that it depends on **temperature** of the air also.

8) What causes the existence of very large number of carbon compound ?

Ans. i. Carbon atoms share the valence electron to form covalent bonds.

ii. The valence electrons are 4 so it has capacity to share 4 electrons and form bonding.

iii. Carbon is having unique characteristic that it can form strong bonds with other carbon atoms.

iv. This property is called as catenation power.

v. Due to this property, carbon forms strong and stable covalent bonds. It causes the existence of very large number of carbon compounds.

Q.4 Solve the following questions. (Any one) **(5)**

1) In the periodic table given below, lithium, carton oxygen and neon are placed in the correct positions and positions of nine other elements are represented by letter. There letters are not the symbol for the elements.

Ans. i. Give the letter of the most reactive metal **- Z**

ii. Give the letter for most reactive non metal **- L**

iii. Name the family of elements represented by L, Q, R,T **– halogens**

iv. Name one elements in each case occurring in group - **group 2 - calcium, group 13 - boron, group 15** 2, 13 and 15**- nitrogen**

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

Ans.

i. Metal A is Sodium with atomic no -11 (2,8,1).

ii. Metal B is Magnesium with atomic no- 12 (2,8,2).

iii. Sodium is more reactive than Magnesium because it has only one electron in its outermost shell, while magnesium has two electrons in its outermost shell. The metal which has less number of electrons in its outermost shell, is more reactive.

iv. Reaction of Sodium with dilute hydrochloric acid.

$2Na$	+	$2HCl$	→	$2NaCl$	+	H_2
Sodium		Hydrochloric acid		Sodium chloride		Hydrogen.

v. Reaction of Magnesium with dilute hydrochloric acid.

Mg	+	$2HCl$	→	$MgCl_2$	+	H_2
Magnesium		Hydrochloric acid		Magnesium chloride		Hydrogen..

****