



# St. Lawrence High School



A JESUIT CHRISTIAN MINORITY INSTITUTION

FIRST TERM 2018

Subject –Physical Science

Date – 26/04/18

Class - VIII

Full Marks : 90

TIME

:2Hrs30mins

## SECTION - A

### I. Choose the correct Option :

1X5=5

- The reciprocal of the focal length of a lens is called its.  
a. Optic Centre    b. Focus    c. Pouce    d. pole
- With which of the following elements will hydrogen reacts to give a gas that smells like rotten eggs ?  
a. Oxygen    b. Chlone    c. Nitrogen    d. sulphur.
- Which of the following is an electrically neutral particle ?  
a. The electron    b. The Proton    c. The neutron    d. none of these
- The electrical charge on an electron is  
a.  $1.6 \times 10^{-19}C$     b.  $1.78 \times 10^8 c$   
c.  $1 \times 10^{-19}c$     d. none of these
- Which of the following atoms has eight electrons in its outernost shell -  
a.  ${}_8O$     b.  ${}_{10}Ne$     c.  ${}_{11}Na$     d.  ${}_{12}Mg$

### II. Fill in the blanks :-

1X10=10

- A reactive metal like potassium, sodium or calcium displaces \_\_\_\_\_ from water.
- Lead oxide is \_\_\_\_\_ by hydrogen to lead.
- For jumping from M shell to the N shell, an electron will \_\_\_\_\_ energy.
- The \_\_\_\_\_ coloured light deviate most as it passes through a prism.
- A \_\_\_\_\_ image can be caught on a screen.
- A \_\_\_\_\_ lens is used in binoculars.
- Rainbow are formed due to the \_\_\_\_\_ of light.
- \_\_\_\_\_ is a red planet.
- The \_\_\_\_\_ eclipse occurs on a full moon day.
- The speed of light in diamond is \_\_\_\_\_ than the speed of light in air.

### III. Write True / False

1X5 = 5

1. A ray of light passing from a rarer medium to a denser medium, after refraction bends away from the normal.
2. The speed of light is more in Cheta than in air.
3. A convex lens is used in correction of myopia.
4. The electron revolves round the nucleus in their own orbits.
5. Magnesium reacts with steam to form magnesium oxide.

### IV. Match the following :

1X5 = 5

- |                         |                      |
|-------------------------|----------------------|
| 1. Hydrogen             | Sodium - vapour lamp |
| 2. For filling balloons | at no. 12            |
| 3. Golden Yellow Light  | at no. 14            |
| 4. Magnesium            | helium               |
| 5. Silicon              | oxyhydrogen flame    |

### SECTION - B

#### Very Short Answer

### V. Questions

2X5 = 10

1. Why is hydrogen considered a clean fuel ?
2. What is the electronic configuration of argon ( $Z=18$ )?
3. Define a galaxy ?
4. Name the following -
  - a) The colour of light having minimum wavelength.
  - b) Splitting of white light into seven constituent colours.
5. Define power of the lens and give its S.I. unit ?

### SECTION - C

### VI. Short Answer type Questions (Any five)

3X5 = 15

1. State 3 differences between a concave lens and convex lens.
2. Explain the laws of refraction of light (with diagram)
3. What is artificial satellite ? Name 2 of them.

4. The focal length of a convex lens is 20 cm. Find its power.
5. What is oxyhydrogen flame ? State one use of it.
6. What is Haber's process ? State with reaction .
7. Explain the phenomenon of dispersion of light ?

### SECTION - D

Long answer question (any eight)

5X8=40

1. State Bohr's Postulates ?
2. Explain with diagram the characteristics of cathode ray.
3. Describe (with diagram) how hydrogen is prepared in the laboratory.
4. Find the absolute Refractive Index of a medium in which the speed of light is  $2.25 \times 10^8$  m/s Assume  $C = 3 \times 10^8$  m/s.
5. How does light behaves when -
  - a. Passes from denser to rarer.
  - b. Passes from rarer to denser.
6. Explain with diagram the nature of image formed by a concave lens when the object is placed -
  - a) at  $2F$
  - b) Between  $O$  and  $F$
7. Explain the observation and conclusions of Rutherford's alpha-Particle Scattering experiment.
8. Explain the ionic bond formation of sodiumchloride.
9. The speed of light is  $3 \times 10^8$  m/s and refractive index of a medium with respect of vaccum is 1.4 . Find the speed of light in that medium.
10. State two uses of both convex lens and concave lens.

S. Naldin  
10/5



**ST. LAWRENCE HIGH SCHOOL**  
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**1<sup>ST</sup> Term Test - 2018**



CLASS VIII  
PHYSICAL SCIENCE      MODEL ANSWERS

SECTION A

I.

1. c. power
2. c. sulphur
3. c. the neutron
4.  $1.6 \times 10^{-19} \text{C}$
5. b.  ${}_{10}\text{Ne}$

II.

- Hydrogen
2. Reduced
3. Gains
4. violet
5. real
6. concave lens
7. dispersion
8. mars
9. lunar
10. less

SECTION B

III.

1. Hydrogen can be considered as clean fuel because the product of reaction is water, which does not pollute the environment.
2. Ar-18 2,8,8
3. A cluster of billions of stars held together by their mutual gravitational forces.
4. violet dispersion
5. The reciprocal of focal length is called as power of lens.  $P=1/f$   
s.i unit is diopetre.

SECTION -C

IV.

1. Concave lens:  
Thin at the middle and thick at the edges. Diverges the rays of light falling on it.  
Always forms virtual and erect image of object. Always forms diminished images.



## CONVEX LENS-

Thick at the middle and thin at the edges.

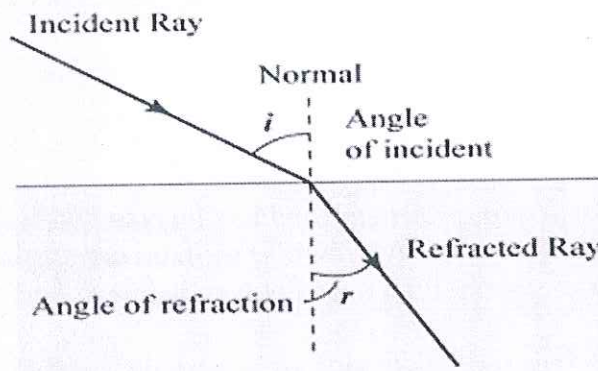
Converges the rays falling on it.

Forms real and inverted images. Forms diminished or magnified images.

2. 1<sup>st</sup> law- The incident ray, refracted ray and the normal all lie in the same plane.

2<sup>nd</sup> law- The ratio of the sine of angle of incidence to the sine of angle of refraction is a constant, for a given pair of media.

$\sin i / \sin r =$  refractive index which is a constant.



In diagram incident ray, angle  $i$ , refracted ray, angle  $r$ , rarer medium, denser medium, normal should be marked.

3. A man made satellite revolving around the earth in an orbit is called artificial satellite. Example-Apple, Rohini, INSAT, Bhaskar..or any other examples.

4.

$$f = 20 \text{ cm} = 0.2 \text{ m}$$

$$P = 1/f$$

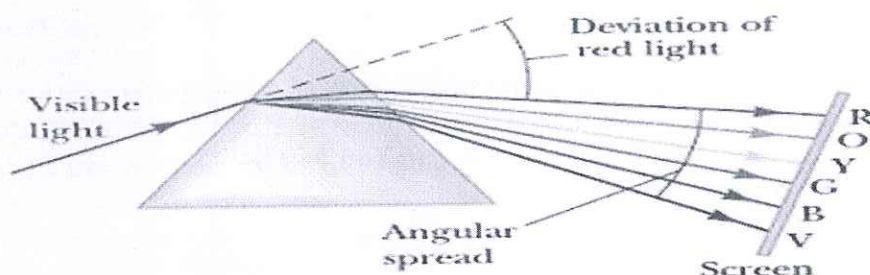
$$= 1/0.2 = 5 \text{ dioptres.}$$

5. When oxygen and hydrogen is passed through different pipes, mix at a point where the mixture is kindled. A high temperature,  $2800^\circ\text{C}$ , flame is produced which is called oxyhydrogen flame. Use- use in welding and cutting of metals.

6. When a mixture of hydrogen and nitrogen is passed over an iron catalyst at  $500^\circ\text{C}$  and 200 atm, ammonia is formed. this process is Haber's process.



7. The splitting of white light into its seven constituent colours is called dispersion of white light. It occurs because different colours of white light travel at different speeds in a particular optical medium. So refractive index of the medium for different colours is different. Thus rays deviate at different angles.

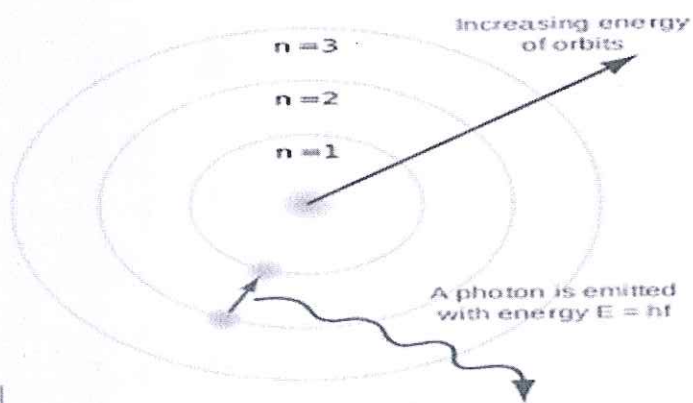


#### SECTION D

1. Bohr postulates:

1. Electrons revolve round the nucleus only in certain permissible circular orbits, called shell.
2. Each orbit has a definite energy.
3. Energy of an electron remains constant so long as it revolves in a given orbit.
4. An electron absorbs energy while jumping from a low energy level to a high energy level.
5. An electron gives out energy while jumping from a high energy level to a low energy level.

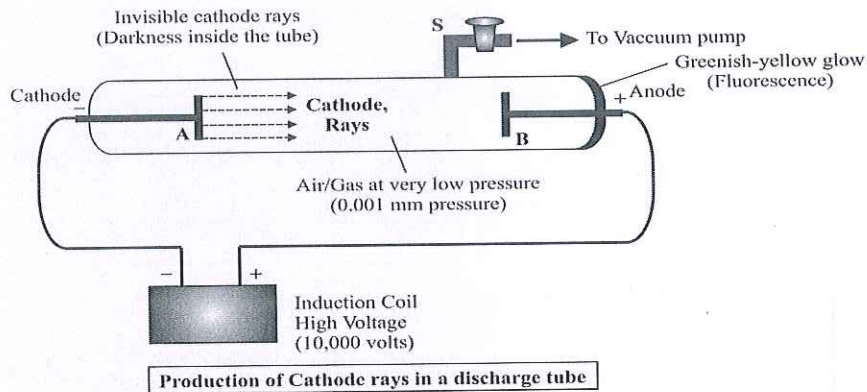
Diagram to be added.  $n=1, n=2, n=3, n=4, n=5$ .



2.characteristics:

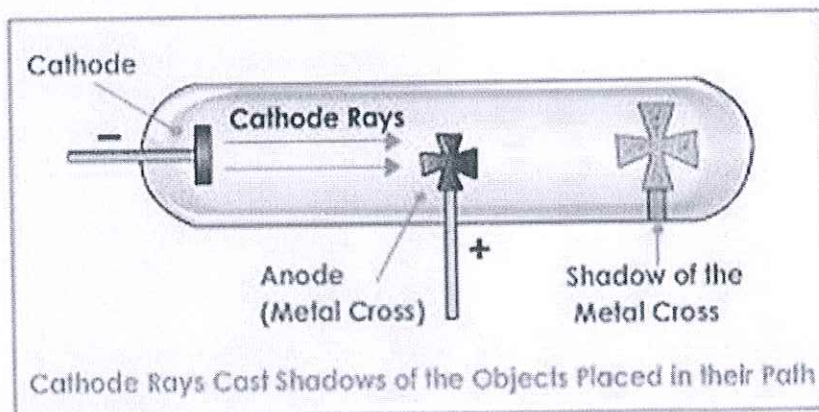
1.cathode ray originate at the cathode and travel in straight lines.

Diagram of discharge tube with metal object.

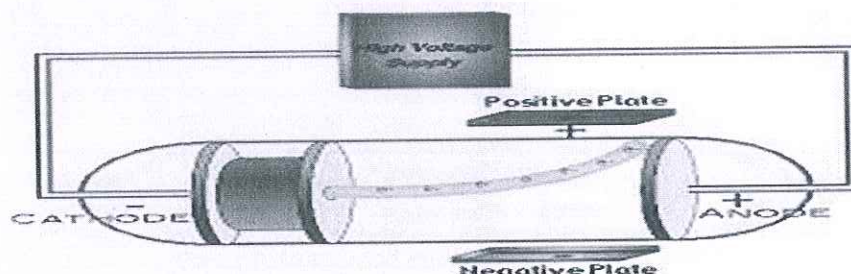


2. Cathode rays are a stream of particles.

Diagram with light paddle wheel.



3. The particles are negatively charged. diagram with positive and negative plate near the discharge tube.

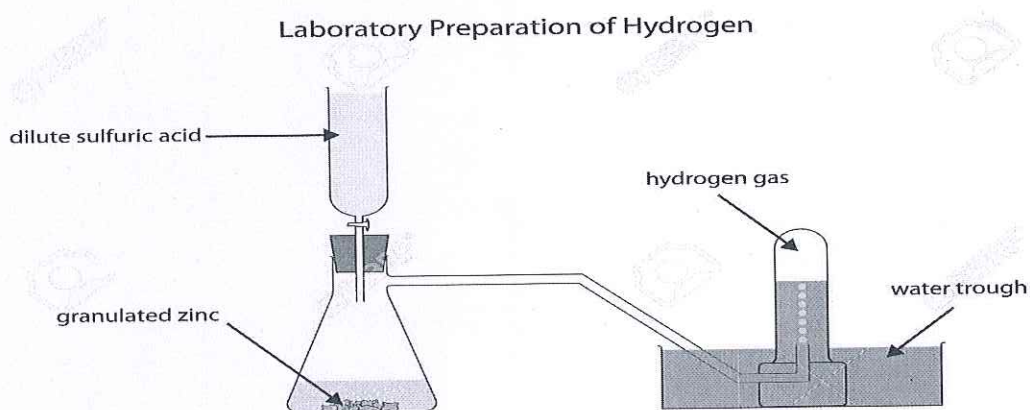


3. Hydrogen is prepared by action of dilute hydrochloric acid or sulphuric acid on granulated zinc.



**PROCEDURE:**

Conical flask with thistle funnel and a delivery tube taken. Zinc granules is placed in conical flask. Dilute HCL or sulphuric acid is added. Hydrogen evolves. Gas is collected by downward displacement of water.



Equation:

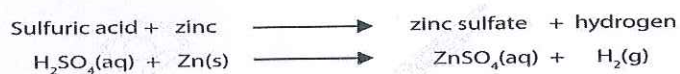




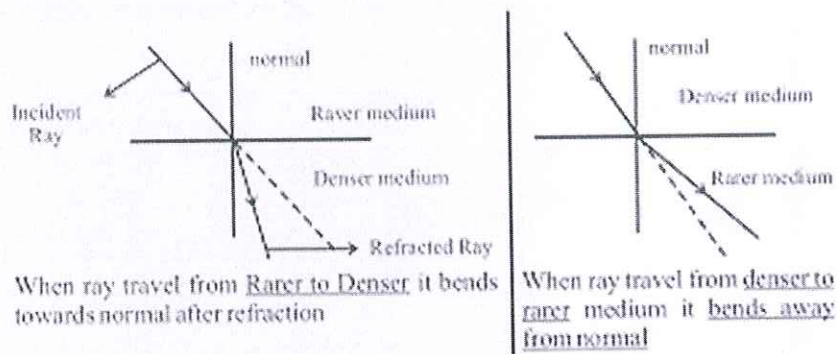
Diagram-funnel,conical flask,delivery tube,waterin a trough,zinc granules to be marked.

3. Absolute refractive index =  $c/v = 3 \times 10^8 \text{ m/s} / 2.25 \times 10^8 \text{ m/s} = 1.33$

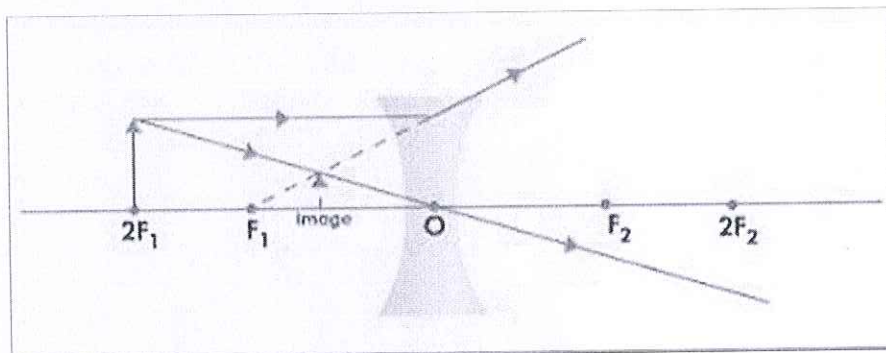
5. a) ray will bend away from the normal angle  $i$  less than angle  $r$ .

b) ray will bend towards the normal angle  $i$  is more than angle  $r$ .

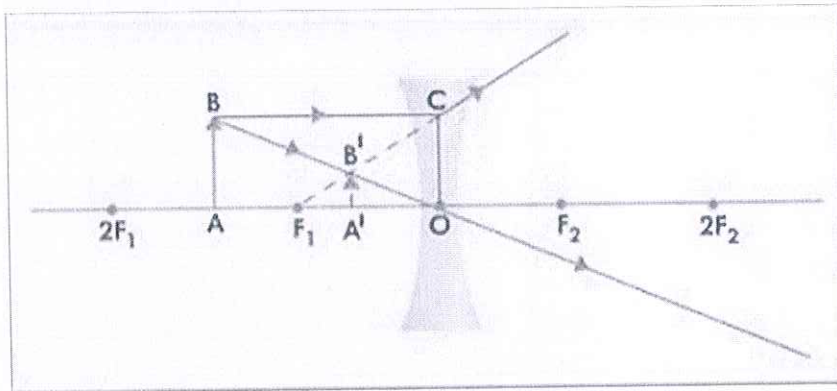
Diagram is .



6. a) nature of image-position of image between  $F$  and  $O$ ,diminished,virtual and erect.

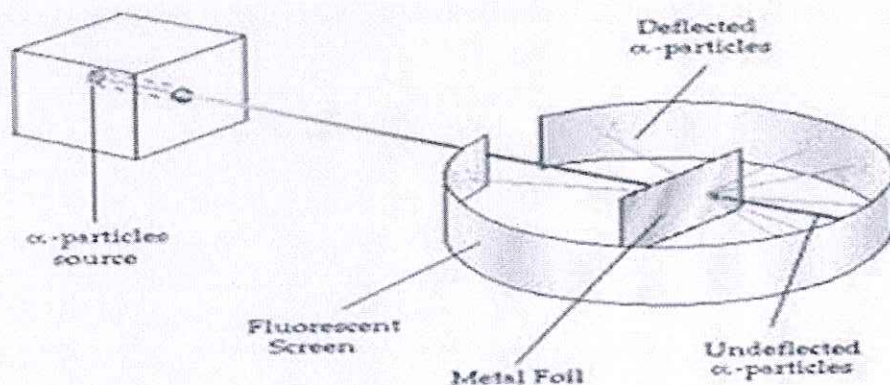


b) position of image between  $F$  and  $O$ . Diminished ,Virtual and erect.



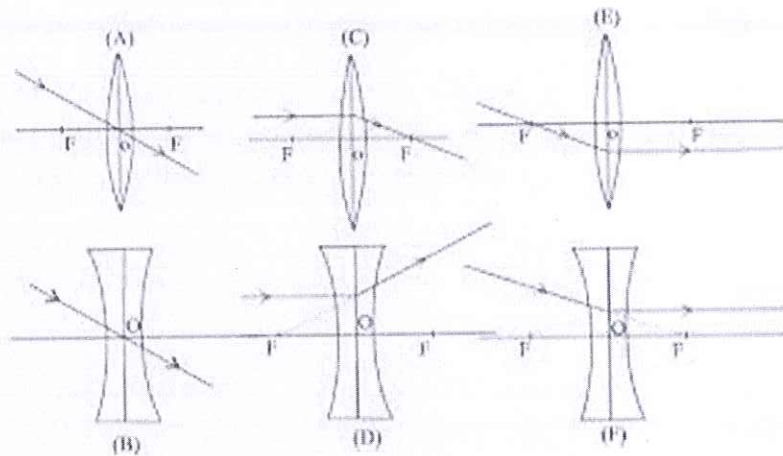
### 7. Rutherford's observation and conclusions-

1. most of the alpha particles went straight. It shows that the atom is mostly empty.
2. some particles deviated slightly from their path. They are repelled to small extent. This means that they were strongly repelled by a small positively charged body at the centre of the atom. This is called nucleus.
3. electrons revolve round the nucleus at large distances from it. Diagram added.. source, thin gold foil, screen, deviation of rays.



### 8. Rules:

1. A ray passing through optical centre of a lens goes through the lens without any deviation. diagram - ray passes from optic centre O,  $F_1$ .
2. A ray incident on the lens parallel to its principal axis converges at the focus of the lens or diverge from the focus after refraction.
3. A ray passing through the focus or appearing to come towards the focus becomes parallel to the principal axis after refraction. Diagrams:



9. refractive index =  $c/v$

Speed of medium  $v = c/\text{refractive index} = 3 \times 10^8 / 1.4 = 2.14 \times 10^8 \text{ m/s}$

10. Uses of convex lens :

As magnifying glasses, cameras, telescopes, microscopes.

It is used in spectacles for correction of hypermetropia.

Uses of concave lens :

In binoculars, in spectacles for the correction of myopia.

In door viewers to see objects outside.