

# NEW STANDARD ACADEMY

Exam : MOCK- 11

NEET - JEE

Marks: 60

Date : 29-03-23

CLASS : 10<sup>TH</sup>

Time: 3 HRS

## PHYSICS

- Light enters from air to glass having refractive index 1.50. What is the speed of light in glass?  
Speed of light in air =  $3 \times 10^8$  m/s.
- Name the type of lens that can be used as magnifying glass. Give reason(s) and draw a ray diagram to support your answer.
- Refractive index of turpentine oil, kerosene and alcohol are 1.47, 1.44 and 1.36 respectively. On the basis of this information, complete the following ray diagram to show path of ray of light through each medium. (Give reason for your answer).
- (a) Define power of a lens and write its SI unit.  
(b) A convex lens forms a real and inverted image of a needle at a distance of 50 cm from it. Where is the needle placed in front of the lens, if image size is equal to the object size? Also, find the power of the lens.
- (a) Calculate the distance at which an object should be placed in front of a convex lens of focal length 10 cm to obtain a virtual image of double its size.  
(b) In the above given case, find the magnification, if image formed is real.  
Express it in terms of relation between  $u'$  and  $u$ .
- What is meant by power of a lens? Write its SI unit. A student uses a lens of focal length 40 cm and another of  $-20$  cm. Write the nature and power of each lens.
- One half of a convex lens of focal length 10 cm is covered with a black paper. Can such a lens produce an image of a complete object placed at a distance of 30 cm from the lens? Draw a ray diagram to justify your answer. A 4 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 20 cm. The distance of the object from the lens is 15 cm. Find the nature, position and size of the image.

## CHEMISTRY

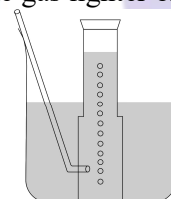
- (a) Potassium chlorate ( $KClO_3$ ) on heating forms potassium chloride and oxygen. Write a balanced equation for this reaction and indicate the evolution of gas.

(b) Rewrite the following information in the form of a balanced chemical equation:  
Magnesium burns in carbon dioxide to form magnesium oxide and carbon.

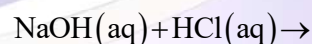
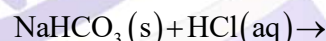
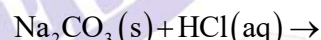
- Name the reducing agent in the following reaction:  
 $3MnO_2 + 4Al \rightarrow 3Mn + Al_2O_3$   
State which is more reactive, Mn or Al and Why?
- A metal is treated with dilute  $H_2SO_4$ . The gas evolved is collected by the method as shown in figure.

Answer the following questions:

- Name the gas liberated.
- Name the method used for collection of gas
- Is the gas soluble or insoluble in water?
- Is the gas lighter or heavier than air?



- Giving an example list two important information which makes a chemical equation more useful (informative).
- Complete and balance the following chemical equations:



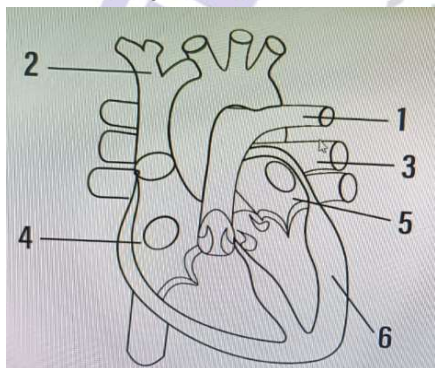
- What happens when an acid reacts with a metal hydrogencarbonate? Write equation of the reaction which takes place.

## BIOLOGY

- What is lymph? How is composition of lymph different from blood plasma? List two functions of lymph.
- Explain the processes of aerobic respiration in

mitochondria of a cell and anaerobic respiration yeast and muscle with the help of word equations.

3. What is a cardiac cycle. ? Which node in the heart is called the pacemaker?
4. a) Why do veins have thin walls as compared to arteries?  
b) Ventricles have thicker muscular walls than atria.
5. Draw the diagram of alimentary canal of human and label the following parts. Mouth,oesophagus, stomach,intestine
6. What is blood pressure? What do you understand by systole and diastole of heart?
7. Given alongside is a diagram of human heart showing its internal structures. Label the parts marked 1 to 6



### MATHS

1. In an  $AP$ , if the common difference  $(d) = -4$  and the seventh term  $a_7$  is 4, then find the first term.
2. For an  $AP$ . if  $a_{25} - a_{20} = 45$ , then find the value of  $d$ .
3. The first three terms of an A.P. are  $3y - 1$ ,  $3y + 5$  and  $5y + 1$  respectively then find  $y$ .
4. Is  $-150$  a term of the AP  $11, 8, 5, 2, \dots$  ?
5. In an AP the sum of first  $n$  terms is  $\frac{3n^2}{2} + \frac{13n}{2}$  find the  $25^{th}$  term.
6. If the ratio of the sums of first  $n$  terms of two  $AP$ 's is  $(7n + 1) : (4n + 27)$ , find the ratio of the  $m^{th}$  terms.
7. The  $18^{th}$  term of an AP is 30 more than its  $8^{th}$  term. If the  $15^{th}$  term of the AP is 48, find the  $AP$ .
8. The sum of first  $n$  terms of three arithmetic progressions are  $S_1, S_2$  and  $S_3$  respectively. The first term of each AP is 1 and common differences are 1, 2 and 3 respectively. Prove that

$$S_1 + S_3 = 2S_2.$$

9. The sum of three numbers in AP is 12 and sum of their cubes is 288. Find the numbers. [CBSE 2016]
10. If the sum of the first 7 terms of an AP is 119 and that of the first 17 terms is 714, find the sum of its first  $n$  terms.