**Aarambh classes**

**Class X(CBSE )**

**Physics Sample paper**

**Time : 2hours M.Marks : 60**

1. An object of height 1.2 m is placed before a concave mirror of focal length 20 cm so that a real image is formed at a distance of 60 cm from it .Find the position of the object.What will be the height of the image formed ? 3
2. Draw a circuit diagram of an electric circuit containing a cell,a key ,an ammeter , a resistor of 4 in series with acombination of two resistors (8 each )in parallel and avoltmeter across the parallel combination.Each of them dissipate maximum energy and can withstrand a maximum power of 16W without melting.Find the maximum current that can flow through the three resistors. 3
3. Rohit focused the image of acandle flame on awhite screen using aconvex lens .He noted down the position of the candle ,screen and lens as under: 4

Position of candle =26 cm

Position of convex lens =50 cm

Position of screen =74 cm

(I)What is the focal length of the convex lens ?

(ii)Where will the image be formed if he shifts the candle towards the lens at a position of 38 cm ?

(iii)Draw a ray diagram to show the formation of the image in case (ii) as said above ?

1. Draw magnetic field lines produced around a current carrying straight conductor passing through a cardboard.Satte and apply right hand thumb rule to mark the direction of these field lines .How will the strength of the magnetic field change ,when the point where magnetic field is to be determined ,is moved away from the straight wire carrying constant current ?Justify your answer. 3
2. A student has focused the image of a candle flame on a white screen using a concave mirror.The situation is as given below : 4

Length of the flame =1.5 cm

Focal length of the mirror =12 cm

Distance of the flame from the mirror =18 cm

If the flame is perpendicular to the principal axis of the mirror ,calculate the following :

1. Distance of the image from the mirror
2. Length of the image

If the distance between the mirror and the flame is reduced to 7 cm,what would be observed on the screen?Draw ray diagram to justify your answer for this situation.

1. (a) What is meant by power of a lens ?The focal length of a lens is -10 cm.Write the nature of the lens and find its power. 3

(b) The image of an object formed by a lens is real,inverted and of the same size as the object.If the image is at a distance of 40 cm from the lens,what is the nature and power of the lens ?Draw ray diagram to justify your answer. 4

7 (i)How many 176 resistors in parallel are required to carry 5 A on a 220 V line ? 2

(ii)Define electric power.Derive relation between power,potential difference and resistance . 2

8. A student placed a 8 cm tall object perpendicular to the principal axis of a convex lens of focal length 20 cm.The diatance of the object from the lens is 30 cm.He obtains a sharp image of the opbject on ascreen placed on the other side of the lens.Stae the nature of the image he obtains on ascreen.Draw a ray diagram to justify your answer. 4

9.Study the circuit shown and answer the following questions :

(i)What is the function of X in the circuit ?

(ii)What would happen to the current drawn from the cell if Xand Y are interchanged ?

(iii)Name and state the function of Z in the circuit.

(iv)Why should we prefer a higher value of the resistance R while verifying Ohm’s law in the laboratory ? 4

10(i) State the laws of refraction of light.Explain the term absolute refractive index of a medium and write an expression to relate it with the speed of light in vaccum . 2

(ii)The absolute refractive indices of two media A and B are 2 and 1.5 respectively.If the speed of light in medium B is 2 x108m/s,calculate the speed of light in :

(a)vaccum (b)medium A 2

11. ‘’A convex lens can form a magnified erect as well as magnified inverted image of an object place in front of it.’’Draw aray diagram to justify this statement stating the position of the object with repect to the lens in each case. 3

12. What is scattering of light ?Use this phenomenon to explain (i)why the clear sky appears blue and (ii)the sun appears reddish at sunrise ? 3

13. What is a solenoid ?Sketch the pattern of magnetic field around a current carrying solenoid .How can you determine the north pole of a current carrying solenoid with the help of a bar magnet ? 3

14. Explain the function of fuse in a domestic circuit .An electric oven having power rating 2000W,220V is used in an electric circuit,having afuse of 5 a rating.What is likely to happen when the oven is switched on ?Explain . 3

15. Two coils of insulated copper wire are wound over a non conducting cylinder as shown.Coil 1 has larger number of turns as compared to that of the coil 2. 5

(i)Write your observations when,

(a)key K is closed ;

(B)key K is opened .

(ii)Give reason for your observations .

(ii)Mention the name of the phenomenon involved and define it.

(iv)Name the two coils used in this experiment.

(V)State fleming;s right hand rule to determine the direction of induced current .

17. State the principle of working of electric motor .What is the role of split ring commutators ? 3