10TH CBSE PHYSICS 2 MARKS TEST 2

10th Standard

Science

Exam Time : 01:00:00 Hrs

Total Marks : 60

30 x 2 = 60

1) What is meant by the statement, "Potential difference between points A and B in an electric field is 1 volt"?

2) An electric lamp is marked 100 W, 220 V. It i used for 5 hours daily. Calculate.
 (i) its reistance while glowing
 (ii) energy consumed in kWh per day

3) An electric iron has a rating of 750 W, 220 V. Calculate
 (i) current passing through it, and
 (ii) its resistance, when in use

4) Should the heating element of an electric iron be made of iron, silver or nichrome wire?

5) Two wires of equal lengths, one of copper and the other of manganin (an alloy) have the same thickness. Which one can be used for :
 (i) electrical transmission lines,
 (ii) electrical heating devices? Why?

6) How can you show that magnetic field produced by a given electric current in the wire decreases as the distance from the increases?

7) What constitutes the field of a magnet?

8) What is meant by the term, 'magnetic field'? Why does a compass needle show deflection when brought near a bar magnet?

9) Explain briefly the term overloading

10) Give one application of electromagnetic induction

11) Name the physical quantities which are indicated by the direction of thumb and forefinger in the Fleming's right hand rule?

12) Insulation cover of which colour is conventionally used for earth wire? Why is an earth wire connected to metallic parts of appliances?

13) State and explain how right hand thumb rule indicates magnetic field.

14) A person uses concave mirror for shaving, where should he position his face in front of it?

15) What is meant by power of a lens?

16) Between which two points of a concave mirror should an object be placed to obtain a magnification of - 3?

17) The speed of light in a transparent medium is 0.6 times that of its speed in vacuum. What is the refractive index of the medium?

18) The outer surface of a hollow sphere of aluminium of radius 50 cm is to be used as a mirror. What will be the focal length of this mirror? Which type of spherical mirror will it provide?

19) Give uses of concave mirror.

20) The image formed by a concave mirror is observed to be virtual, erect and larger than the object. Where should the position of the object be relative to the mirror? Draw ray diagram to justify your answer.

21) List four characteristics of the images formed by plane mirrors.

22) List four specific characteristics of the images of the objects formed by convex mirrors.

23) The sky appears dark instead of blue to an astronaut.State its reason.

24) State one function of iris in human eye.

25) State one role of ciliary muscles in the human eye.

26) What will be the colour of the sky, when it is observed from a place in the absence of any atmosphere? Why?

27) What is the colour of the clear sky during day time? Give reason for it.

28) Name the three common defects of vision.What are their causes?Name the type of lens used to correct each of them.

29) Define the term dispersion of white light.State the colour which bends (i)the least and (ii)the most while passing through a glass prism.

30) Explain giving reason why the sky appears blue to an observer from the surface of the earth?What will the colour of the sky be for an astronaut staying in the international space station orbiting the earth? Justify your answer giving reason.

****

Time : 01:00:00 Hrs

Total Marks : 60

30 x 2 = 60

1) It means that 1 joule of work will be done in order to move 1 coulomb of charge from point A to B.

2) (i) Resistance of a glowing lamp is related to its power and voltage as

Power=$\frac{(voltage)^2}{Resistance}$

or, P=$\frac{V^2}{R}$

Therefore, R=$\frac{V^2}{P}=\frac{220^2}{100}$=484$\Omega$

Therefore, the resistance of the bulb when glowing is 484Ω

(ii) Power=100 W=0.1 kW

Energy= Power x time

=0.1 kW x 5h

=0.5 kWh

0.5 kWh is the amount of energy is consumed by the bulb per day.

3) (i) Electric power is related to voltage and electric current as:

Power= Voltage x Current

It is given that the rating of the electric iron is 750W, 220V.

Let the current passing through the bulb be I.

Therefore,

750=220 x I

I=$\frac{750}{220}$=3.41A

Therefore, 3.41A current passes through the electric iron.

It is given that the rating of the electric bulb is 750W,220 V

Therefore, P=$\frac{V^2}{P}=\frac{220^2}{750}$=64.53$\Omega$ when in use.

(ii) Electric power is related to voltage and resistance as:

$\frac{(Voltage)^2}{Resistance}$

That is,

P=$\frac{V^2}{R}$

=64.53Ω

4) Nichrome should be used as a heating element in an electric iron because its melting point is higher than iron and silver.

5) (i) Copper is used as electrical transmission lines as it has lesser resistivity.

(ii) Manganin is used for electrical heating divice as it has the comparatively higher resistivity, less oxidation and variation with temperature.

6) A magnetic needle shows deflection when it is placed near a current-carrying electric wire. As the magnetic needle is taken away from the wire, its deflection decreases and finally the needle align itself along North-South direction. This indicates that the magnetic field produced by a given electric current in the wire decreases as the distance from the increases.

7) Magnetic field of a magnet contains magnetic field lines in it.

8) Magnetic field is the region around a magnet in which a magnetic material experiences a force because of that magnet. The needle of a compass is actually a small bar magnet. So, when a compass is brought near a bar magnet, the compass needle enters the magnetic field of the bar magnet. Therefore, the needle experiences a force because of the bar magnet and gets deflected.

9) When the total current drawn by all the appliances at a particular time exceeds the bearing capacity of that wire, the wires of the domestic wiring gets heated this is called overloading.

10) This phenomenon is used in electric generator.

11) In Fleming's right hand rule, thumb indicates - direction of motion of the conductor; forefinger indicates - direction of magnetic field.

12) The earth wire is of green colour or may be yellow in some cases. The earth wire provides a low resistance conducting path for electric current. If there is any leakage of current then the user would not get any current because the current flows down into the earth and keeps the potential of the appliance and earth same.

13) Right hand thumb rule -Imagine holding the current carrying straight conductor in your right hand such that the thumb points towards the direction of current. Then the fingers of right hand wrap around the conductor and shows the direction of the magnetic field formed around it.
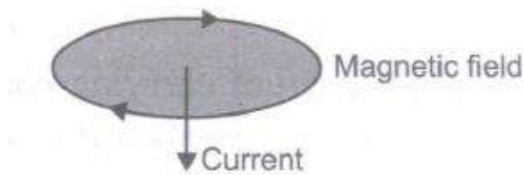
14) Between pole and principal focus

15) It is a measure of the degree of convergence or divergence of light rays falling on it. It can also be defined as the reciprocal of its focal length in metres.

16) The negative sign of magnification shows that the image is real and inverted. Hence, the object must be positioned between F and 2F.

17) Since, $n = \frac{c}{v}$ we get, $n = \frac{c}{0.6c} = \frac{1}{0.6} \approx 1.67$

18) $f = \frac{R}{2} = 25cm$ It will form a convex mirror.

19) (a) Used in torches, search lights and vehicle headlights. (b) Used as shaving mirror. (c) Used by dentist. (d) Used in solar furnance

20) When the object is placed between pole and focus of the concave mirror, the image formed is virtual, erect and magnified.
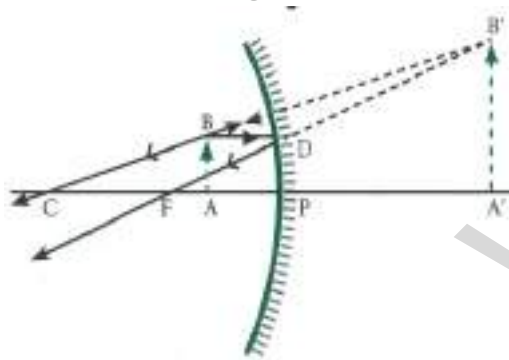
21) (i) The image formed by a plane mirror is virtual and erect. It cannot be received on a screen.
(ii) The image formed by a plane mirror is of the same size as the object.
(iii) The image formed by a plane mirror is at the same distance behind the mirror as the object is in front of the mirror.
(iv) The image formed in a plane mirror is laterally inverted.

22) The images of the objects formed by convex mirrors are always
(i) virtual
(ii) erect
(iii) diminished and
(iv) formed behind the mirror between focus and pole of the mirror.

23) The sky appears dark to the astronauts due to absence of atmosphere at very high altitudes.

24) It regulates the amount of light entering the eye by adjusting the size of the pupil.

25) The focal length of eye lens can be changed by changing its shape by the action of ciliary muscles.

26) Since there is no atmosphere, there would be no scattering of light.Hence the colour of the sky will be dark.

27) (i) The clear sky appears blue during day time.
(ii) When sunlight passes through the atmosphere having the molecules of air and other fine particles, whose size is smaller than the other colors of spectrum as the wavelength of blue colour is more. This scattered blue light enters our eye. So, the colour of sky appears blue to us during day time.

28) (i) Myopia :
Cause: Elongation of eyeball,
Type of lens used for correction:
Concave lens of suitable power.
(ii) Hypermetropia:
Cause: Shrinking of eyeball,
Type of lens used for correction:
Concave lens of suitable power.
(iii) Presbyopia:
Cause: Weakening of ciliary mucles,
Type of lens used for correction:
Bifocal lens.

29) (a)the splitting up of white light into its component colours is called dispersion.
(b)(i)red (ii)violet

30) (i) The molecules of air and other fine parties in the atmosphere have a size smaller than the wavelength of visible light. So these particles scatter more effectively the light rays of shorter wavelength at the blue end than light of longer wavelengths at the red end. When the scattered blue light enters our eyes, it gives us the feeling of a blue sky.
(ii) There, is no atmosphere containing air in space to scatter sunlight. As there is no scattering of light in space, the scattered of light does not reach the eyes and the sky appears dark instead of blue to an astronaut in outer space.