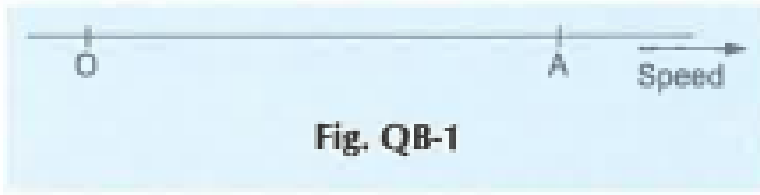# PHYSICS

BOOKS - HC VERMA

QUESTION BANK

Question Bank

1. The speed of light is shown in the figure by the point A. The point O represents zero speed.The point on the line representing

speed of sound should be drawn

Fig. QB-1

A. just to the right of O

B. at the middle of O and A

C. just to the left of A

D. to the right of A

Answer: A

2. Light falls obliquely on the surface of a thick glass slab as shown in the figure. Which statement among the following is correct
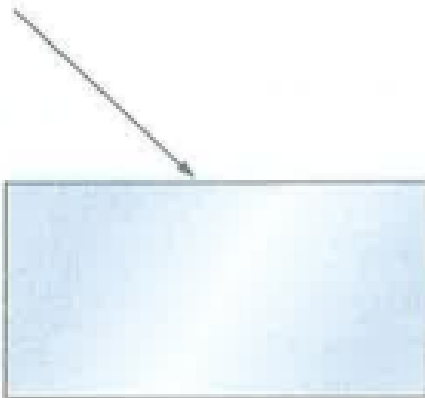

Fig. QB-2

A. Light stops at the surface.

B. Light reflects at the surface but does not

refract.

C. Light refracts at the does not reflect

D. A part of the light reflects at the surface

and a part of it refracts.

Answer: D

▶ **View Text Solution**

3. A real image of a point object is formed in a mirror when

    A. the incident rays intersect

    B. the reflected rays actually intersect

    C. the incident rays seem to diverge from a point

    D. the reflected rays seem to diverge from a point

Answer: B

4. A lens is fitted inside a tube. A parallel beam of light enters the tube, goes through the lens and emerges as a divergent beam, as shown in Figure QB-3. The lens in the tube

Fig. QB-3

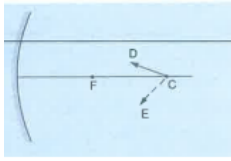A. nust be concave

B. must be convex

C. may be convex or concave

D. cannot produce the emergent beam

Answer: C

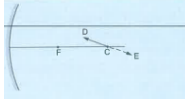▶ **View Text Solution**

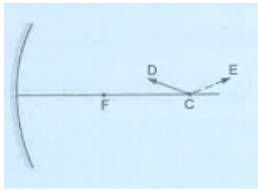**5.** The four figures below show a concave mirror whose focus is F and the centre of curvature is C . CD is an object. Which figure correctly represents its image CE?

A.

B.

C.

D.

Answer: D

▶ View Text Solution

6. Light passes from a medium A to another medium B without bending at the interface. Which of the following is not possible ?

A. A and B have the same refractive index and light falls on the interface obliquely.

B. A and B have the same refractive index and light falls on the interface perpendicularly.

C. A and B have different refractive indices and light falls normally on the interface.

D. A and B have different refractive indices and light falls obliquely on the interface.

Answer: D

▶ **View Text Solution**

7. When a convex lens forms an image whose size is equal to that of the object , the object is placed

A. at a distance less then f

B. between f and 2f

C. at 2f

D. beyond 2f

Answer: C

▶ **View Text Solution**

8. A convex lens an image some distance away from the lens. If the image is erect, the object is placed

A. at a distance less then f

B. between f and 2f

C. at 2f

D. beyond 2f

Answer: A

▶ **View Text Solution**

9. The power of a convex lens of focal length 5 cm is

A. $+20D$

B. $+50D$

C. $-20D$

D. $-50D$

Answer: A

 View Text Solution

10. The ability of the eye to adjust the focal length of the eye-lens to from sharp images is called

A. distinct vision

B. dilation

C. accommodation

D. hyperopia

Answer: C

▶ **View Text Solution**

11. The eye adjusts the focal length of the eye-lens with the help of

A. accommodation

B. ciliary muscles

C. cetina

D. cornea

Answer: B

▶ **View Text Solution**

12. The standard value of the least distance of

distinct vision is

A. 20 mm

B. 20 cm

C. 25 mm

D. 25 cm

Answer: D

▶ **View Text Solution**

13. A lady is prescribed bifocal lenses. She is suffering from

A. nearsightedness only

B. farsightedness only

C. both hypermetropia and hyperopia

D. both nearsightedness and

farsightedness

Answer: D

▶ **View Text Solution**

14. When light enters the eye and is focused on the retina, most of the bending occurs at the

A. cornea

B. crystalline lens

C. retina

D. pupil

Answer: A

▶ **View Text Solution**

15. The eyeball of a person is elongated as compared to that of a normal eye. He is suffering from

A. nearsightedness

B. far-sightness

C. presbyopia

D. cataract

Answer: A

▶ **View Text Solution**

16. Yellow light and green light travel at almost the same speed in

A. air

B. water

C. glass

D. glycerin

Answer: A

▶ View Text Solution

17. A beam of white light falls perpendicularly on the first surface of a prism. Dispersion will take place

A. at the first surface but not at the second surface

B. at the second surface but not at the first surface

C. at both the surfaces

D. neither at the first surface nor at the second surface

Answer: B

18. When sunlight falling on drops of water forms a rainbow , the number of times it undergoes refraction at a drop is

   A. one

   B. two

   C. three

   D. four

Answer: B

19. A little milk mixed in water makes the path of a laser beam passing through it visible. This because

    A. milk has more density than water

    B. milk has a larger refractive index than water

    C. milk has fat particles which scatter light

D. milk is soluble in water

Answer: C

▶ **View Text Solution**

20. The sun appears red at sunrise and white when it is overhead at noon because

A. the distance between the sun and the earth is greater is greater at sunrise than at noon

B. the distance between the sun and the

earth is greater at sunrise than at noon

C. sunlight has to travel a lesser distance in

the atmosphere at sunrise than at noon

D. sunlight has to travel a greater distance

in the atmosphere at sunrise than at

noon

Answer: D

▶ View Text Solution

21. Mark the statements True (T) or False(F):Total internal is involved in the formation of a rainbow.

▶ View Text Solution

22. Mark the statements True (T) or False(F):In the formation of a rainbow, when sunlight is incident on a raindrop, a part of the incident sunlight gets reflected.

▶ View Text Solution

23. Mark the statements True (T) or False(F):The dimensions of the crystalline lens of the eye may change to from a sharp image but the size of the pupil never changes.

▶ View Text Solution

24. Mark the statements True (T) or False(F):Light enters the eye and is refracted only when it falls on the crystalline lens.

▶ View Text Solution

25. Mark the statements True (T) or False(F):The amount of light going into the eye is controlled by the iris-pupil combination.

▶ View Text Solution

26. Mark the statements True (T) or False(F):If the amount of light of the eyes is at a distance farther than the normal, the person suffers from near-sightedness.

▶ View Text Solution

27. Mark the statements True (T) or False(F):A lens that cannot form an image on a screen is a concave lens.

▶ View Text Solution

28. Mark the statements True (T) or False(F):A mirror that cannot an image on a screen is a concave mirror.

▶ View Text Solution

29. Mark the statements True (T) or False(F):A convex mirror gives a wider view than a plane mirror of the same size.

▶ View Text Solution

30. Mark the statements True (T) or False(F):Dentists use a convex mirror to examine teeth because it forms a magnified image.

▶ View Text Solution

31. Below each item in the first column write the numbers of the appropriate items from the other two columns to match. One has been done of you . (f=focal length, r=radius of curvature)

Object position and mirror/lens type	Image position	Image type
A. 5 cm in front of a plane mirror	i. At infinity	1. Real
ii, 2, 3, 7	ii. 5 cm from the mirror	2. Virtual
B. 10 cm from a concave mirror of $f = 5$ cm	iii. 30 cm from the lens	3. Erect
	iv. 10 cm from the mirror	4. Inverted
C. Object at infinity for a convex mirror of $f = 15$ cm	v. 5 cm from the lens	5. Smaller than object
D. 30 cm from a convex lens of $f = 15$ cm	vi. 15 cm from the lens	6. Larger than object
	vii. 15 cm from the mirror	7. Same size
		8. Point-sized

▶ **View Text Solution**

32. A spherical mirror forms a real image of an object that is 3 times as big as the object is the image erect or inverted ?

33. A ray of light goes from medium A to Medium B. The angle of incidence is $30°$ and the angle of refraction is $45°$. Find the ratio v_A/v_B, where v_A is the speed of light in

Medium A and v_B is the speed of light in medium B.

34. An object is placed 60 cm from a screen .Where should you place a convex lens of focal length 15 cm to get the image of the object on the screen ?

35. An object of size 2 cm is placed 54 cm from a scree. A convex lens of focal length 12 cm is placed between the two such that the image of the object forms on the screen. Find the two possible positions of the lens, and for each position find the size of the image.

▶ **View Text Solution**

36. 1 coulomb`xx1......= 1 joule. The missing word is

A. volt

B. ampere

C. ohm

D. watt

Answer: A

▶ **View Text Solution**

37. The direction of current in a wire is

A. the same as the direction of the flow of

electrons through the wire

B. opposite to the direction of flow of the

electrons through the wire

C. the same as the direction of flow of the

newtrons through the wire

D. opposite to the direction of flow of

neutrons through the wire

Answer: B

▶ **View Text Solution**

38. Ampere in the same as

    A. volt/second

    B. watt/second

    C. joule/second

    D. coulomb/second

Answer: D

▶ **View Text Solution**

39. To get a constant nonzero potential difference between the two contacts of bulb, you should join the contacts to

A. a copper wire

B. a plastic wire

C. an electrical socket in your house

D. the terminals of a battery

Answer: D

▶ View Text Solution

40. Carbon is a

A. conductor in its graphite form but insulator in its diamond form

B. insulator in its graphite form but conductor in its diamond form

C. conductor in both its graphite and diamond forms

D. insulator in both its graphite and diamond forms

Answer: A

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41. Pick the correct statement.

    A. An electric field has a direction and so does a magnetic field.

    B. An electric field has a direction , but a magnetic field does not.

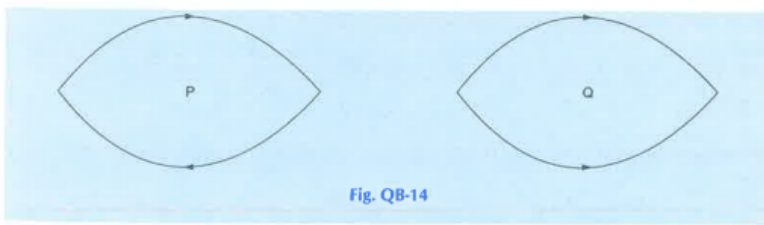C. A magnetic field has a direction, but an electric field does not.

D. Neither an electric field nor a magnetic field has a direction.

Answer: A

▶ View Text Solution

42. For the figure given below, which statement is correct?

Fig. QB-14

A. Both P and Q can represent a magnetic

field line.

B. P can represent a magnetic field line, but

Q cannot

C. Q can represent a magnetic field line,

but p cannot.

D. Neither can represent a magnetic field

line.

Answer: B

43. Consider a bar magnet placed in a lab. The magnetic field due to this magnet

   A. will exist outside the magnet, but not inside it

   B. will exist inside the magnet, but not outside it

C. will exist both outside and inside the magnet

D. will exist only outside and inside the magnet

Answer: C

44. (·) is the symbol for

A. a resistor

B. a fuse

C. a bulb

D. a plug key(ON)

Answer: D

▶ **View Text Solution**

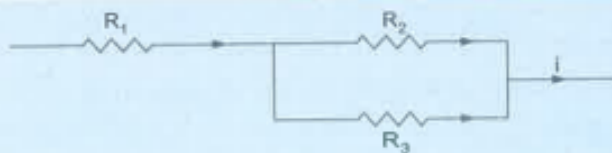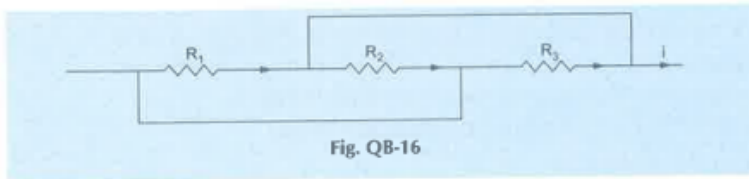**45.** Look at the figure below and pick the correct statement.

Fig. QB-15

A. R_1 and R_2 are connected in series.

B. R_1 and R_2 are connected in parallel.

C. R_2 and R_3 are connected in series.

D. R_2 and R_3 are connected in parallel.

Answer: D

▶ View Text Solution

46. Look at the figure below and pick the correct statement.

Fig. QB-16

A. R_1, R_2 and R_3 are joined in series.

B. R_1, R_2 and R_3 are joined in parallel.

C. R_1 and R_2 are joined in series, and R_3 is

joined in parallel to their combination

D. R_1 and R_2 are joined in parallel, and R_3 is joined in series with their combination.`

Answer: B

▶ **View Text Solution**

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47. Which of the following masses is closest to the mass of a proton ?

A. 10^{-27} kg
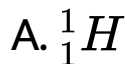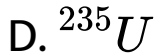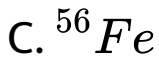
B. 10^{-31} kg

C. 10^{-19} kg

D. 10^{-15} kg
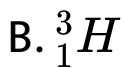
Answer: A

▶ View Text Solution

48. Which of the following elements is most widely used for nuclear fission?

A. $_{1}^{1}H$

B. $^3_1 H$

C. $^{56} Fe$

D. $^{235} U$

Answer: D

▶ View Text Solution

49. As a metal filament gets heated, its resistance increases. When a potential difference of 100 volts is applied across a filament bulb, the current flowing through it is

found to be 0.4 A. When a potential difference of 200 volts is applied across the same bulb, it glows more. The current in the bulb can be expected to be expected to be

A. 1.6 A

B. 0.8 A

C. less than 0.8 A

D. more than 0.8 A

Answer: C

▶ View Text Solution

50. A 2-A current flows through a resistor when a potential difference of 20 V is applied across it. The resistance of the resistor is

A. 2Ω

B. 1Ω

C. 10Ω

D. 20Ω

Answer: C

51. A battery connected to a resistance supplies a current of 5A. If an equal resistance is connected in parallel with the first resistance, the current supplied by the battery will be

A. 15 A

B. $10A$

C. $5A$

D. $2.5A$

Answer: B

52. The equivalent resistance of three equal resistances connected in series is 27Ω. There equivalent resistance when connected in parallel is

   A. 54Ω

   B. 270Ω

   C. 3Ω

D. 9Ω

Answer: C

⏵ **View Text Solution**

53. An electric coil rotates in a magnetic field

A. in a motor but not in a dynamo

B. in a dynamo but not in a motor

C. in a motor as well as in a dynamo

D. neither in a motor nor in a dynamo

Answer: C

54. The direction of the force exerted by a magnetic field on a current -carrying wire is given by

    A. ohm's law

    B. fleming 's left-hand thumb rule

    C. maxwell's right -hand thumb rule

    D. fleming's right-hand rule

Answer: B

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55. In a household appliance connected to the mains,

    A. the current enters and leaves through the live wire

    B. the current enters through the live wire and leaves through the earth wire

C. the current enters through the earth wire leaves through the live wire

D. the current enters through the live wire and leaves through the neutral wire

Answer: D

▶ View Text Solution

56. Mark the statement True (T) or False (F): A magnet made of a hard magnetic material retains its magnetism for long time .

57. Mark the statement True (T) or False (F): In domestic wiring, the wires used for 15-A circuits are thicker than the wires used for 5 -A circuits.

58. Mark the statement True (T) or False (F): A heavy current drawn by a household device

causes the circuit breaker to trip. After some time, the circuit breaker resets itself, restoring the current in the circuit.

▶ **View Text Solution**

59. Mark the statement True (T) or False (F): An AC generator will work if you pass an alternating current through it.

▶ **View Text Solution**

60. Mark the statement True (T) or False (F):

The electronvolt is a unit of energy.

▶ View Text Solution

61. Mark the statement True (T) or False (F):

The magnetic field outside a current-carrying solenoid is parallel to the axis of the solenoid.

▶ View Text Solution

62. Mark the statement True (T) or False (F):

The poles of an electromagnet get switched if the direction of the current is reversed.

▶ **View Text Solution**

63. Mark the statement True (T) or False (F):

The resistance of a wire is directly proportional to its area of cross section.

▶ **View Text Solution**

64. Mark the statement True (T) or False (F):

The heat produced in a current -carrying wire is proportional to the square of the current .

▶ View Text Solution

65. Mark the statement True (T) or False (F):

One unit of electrical energy means 1000 watt hours of electrical energy.

▶ View Text Solution

66. Below each item in the first column write the numbers on the appropriate items from the other two columns to match.($R_{eq}=$ equivalent resistance of the combination, $i_{each}=$ current through each resistor, $V_{each}=$ potential difference across each resistor, and so on)

Object position and mirror/lens type	Image position	Image type
A. 5 cm in front of a plane mirror	i. At infinity	1. Real
ii, 2, 3, 7	ii. 5 cm from the mirror	2. Virtual
B. 10 cm from a concave mirror of $f = 5$ cm	iii. 30 cm from the lens	3. Erect
	iv. 10 cm from the mirror	4. Inverted
C. Object at infinity for a convex mirror of $f = 15$ cm	v. 5 cm from the lens	5. Smaller than object
D. 30 cm from a convex lens of $f = 15$ cm	vi. 15 cm from the lens	6. Larger than object
	vii. 15 cm from the mirror	7. Same size
		8. Point-sized

▶ **View Text Solution**

67. A wire of length 10 cm and area of cross section $1mm^2$ has a resistance of 5Ω. Find the resistivity of the material of the wire.

▶ View Text Solution

68. What values of resistances can you get by combining two resistances of values 8Ω and 12Ω ?

▶ View Text Solution

69. What values of resistances can you get by combining three $6 - \Omega$ resistances ?

▶ **View Text Solution**