

Our Lady of Pillar Convent School, Jodhpur



X-PHYSICS

OBJECTIVE QUESTIONS

General Instructions:

- ✓ This practice sheet consists of objective questions that have been included as per the latest paper pattern given by CBSE for the current session.
- ✓ It includes Passage based questions, Tabular data based questions, MCQs and Assertion Reason questions.
- ✓ This worksheet will help to give an insight about the type and nature of questions that are put up in Physics portion of Science in the board exam.

- 1) Answer the question numbers (a) – (d) on the basis of your understanding of the following paragraph and the related studied concepts.

Using a 50-50 mixture of deuterium H_1^2 and tritium H_1^3 , scientists at Princeton University in USA have produced a world-record setting burst of fusion energy equivalent to three million watts (3×10^6 W) of power on December 10, 1997. The power output in this experiment lasted only four seconds. The Princeton group expects to increase the power of its reactor to 10 million watts very soon. This raises the prospects for abundant and cheap electrical power in the future.

- (a) Name the process being employed in the passage in producing energy.
 - (b) Calculate the amount of energy in joules produced in the experiment explained in the passage.
 - (c) What will be the product of fusion?
 - (d) Under what condition of pressure and temperature does the above process take place.
- 2) Answer the question numbers (a) – (d) on the basis of your understanding of the following paragraph and the related studied concepts.

Fossil fuels are non-renewable sources of energy. If the demand for energy continues to increase even at the present rate, these might not last for long. To prevent energy crisis in near future, efforts are being made to find more and more sources of energy, preferably the renewable sources of energy. Sun emits visible, infrared and small amount of ultraviolet radiations. Visible radiation gives light energy and infrared radiation gives heat energy. The combination of light and heat energies of the sunlight have been used for its utilization. Under clear sky conditions, 4-7 kW solar energy falls on one km^2 area in a day. Our country has 250-300 sunny days in a year. Thus, India can harness energy of about 2 MW/ km^2 per year through the use of solar technology.

- (a) What term will you give to the combination of light and heat energy as mentioned in the passage:
 - (i) Solar energy
 - (ii) Geothermal energy
 - (iii) Nuclear energy
 - (iv) None of these
- (b) Name any two devices, through which India make use of solar energy.

OR

- Which rays emitted by sun can cause harmful effects to the living organisms on earth?
- (c) Identify any one way by which the radiations from sun has caused harm to us?
 - (d) Which one of the following cannot be employed in utilizing solar energy?
 - (i) Water heater
 - (ii) Rainwater harvesting
 - (iii) Solar cooker
 - (iv) Photovoltaic cell

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- 3) Question numbers 3(a) to 3(d) are based on the table related to the values of absolute refractive index of different material mediums. Study the table and answer the questions that follow.

Material medium	Refractive index	Material medium	Refractive index
Air	1.0003	Canada Balsam	1.53
Ice	1.31		
Water	1.33	Rock salt	1.54
Alcohol	1.36		
Kerosene	1.44	Carbon disulphide	1.63
Fused quartz	1.46	Dense flint glass	1.65
Turpentine oil	1.47	Ruby	1.71
Benzene	1.5	Sapphire	1.77
Crown glass	1.52	Diamond	2.42

- (a) Name the medium having highest optical density.
(b) Find the medium with lowest optical density.
(c) You are given kerosene, turpentine and water. In which of these does the light travel fastest?
(d) In which of the mediums mentioned in table does the light travel slowest?
- 4) Question number 4(a) to 4(d) is based on the table given below. Study the points related to human eye written in column-A and answer the questions that follow:

Column-A	Column-B
Lens used for correction of short sightedness	(a) _____
Range of vision of normal healthy human eye	(b) _____
Light-sensitive cells for darkness or brightness.	(c) _____
Old-age long sightedness	(d) _____

- 5) Answer the question numbers (a) – (d) on the basis of your understanding of the following paragraph and the related studied concepts.

Oceans cover about 70.8% of the earth's surface and are the biggest source of water on the earth. Due to the large mass of water in oceans and high heat capacity of water, oceans act as a storehouse of energy. Apart from this, ocean water also possess kinetic energy due to its tidal waves. The sited identified in India for harnessing tidal energy are – Navalakhi and Kandla (Gulf of Kutch), Bhavnagar (Gujarat) Sagar and Hugli (West Bengal). To harness tidal energy, a huge barrage is constructed across a narrow opening to the sea.

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- (a) Give two advantages of tidal energy.
(b) Give two limitations of tidal energy.
(c) Which of the following is the form of ocean energy which can be harnessed easily?
(i) Ocean Thermal Energy (ii) Wave Energy
(iii) Tidal Energy (iv) All of these
(d) What name will you give to the barrage given in passage that is constructed across a narrow opening to the sea, to harness tidal energy?
- 6) Question numbers 6(a) to 6(d) is based on the table related to the values of current **I**, flowing in a given resistor for the corresponding values of potential difference **V** across the resistor. Study the table and answer the questions that follow:

V (v)	0.5	1.0	2.0	3.0	4.0
I (A)	1.85	3.70	7.40	11.0	15.0

- (a) Calculate the resistance of the resistor.
(b) What type of curve you will obtain if you plot the above values of I and V?
(c) Name any one safety you will prefer while doing the experiment to record the values given in the table.
(d) Which one of the following values of current can cause harm to us?
(i) 3 A (ii) 5 A (iii) 4 A (iv) None of these

Answer Key:

1) Solution:

- (a) Nuclear fusion
(b) Energy = Power x Time = $3 \times 10^6 \times 4 = 12 \times 10^6$ J
(c) Helium
(d) High pressure and high temperature

2) Solution:

- (a) Solar energy
(b) Solar cooker and solar panel/solar cell

OR

- Ultraviolet rays
(c) Deforestation/CFC gases released from refrigerator and AC
(d) Rainwater harvesting

3) Solution:

- (a) Diamond
- (b) Air

(c) Since, $\mu_m \propto \frac{1}{v_m}$, μ_{water} is the least hence velocity of light will be maximum in water.

(d) Since, $\mu_m \propto \frac{1}{v_m}$, μ_{diamond} is maximum hence velocity of light will be slowest in diamond.

4) Solution:

- (a) Concave lens
- (b) 25 cm to ∞
- (c) Rods and cones
- (d) Presbyopia

5) Solution:

- (a) Renewable source of energy and it cause no air pollution
- (b) Limited power generation (Not reliable) and it is not cost effective
- (c) All of these
- (d) Dam

6) Solution:

(a) $R = \frac{V}{I} = \frac{0.5}{1.85} = 0.27 \Omega$

- (b) It will be a straight line which means that $V \propto I$
- (c) Use of fuse
- (d) 5 A

✚ Assertion-Reason based Questions:

- Each of these questions contain two statements, Assertion (A) and Reason (R). Each of these questions also has four alternative choices, only one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.

(a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.

(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion

(c) Assertion is correct, reason is incorrect

(d) Assertion is incorrect, reason is correct.

7) **A:** Solar cooker with covered glass slab is efficient

R: It will show greenhouse effect

8) **A:** Increasing dependence on nuclear power generation is a threat for future generation.

R: Radiation emitted during leakage can change the genetic arrangement.

9) **A:** It is advised to clean the ends of the connecting wires before connecting them.

R: Current is present at the ends.

10) **A:** Dam is a barrier that is built across a river or a stream.

R: Large dam can ensure the storage of adequate water for irrigation and also for generating electricity.

11) **A:** The slurry left behind in a biogas plant is used as a manure

R: Slurry contains methane and phosphorous as two main nutrients in it.

12) **A:** A current carrying conductor experience a force in the magnetic field

R: The force acting on a current carrying conductor in a magnetic field is due to interaction between magnetic fields produced by the conductor and external magnetic field.

13) **A:** In Fleming's left hand rule, the direction of magnetic field, force and current are mutually perpendicular.

R: Fleming's left hand rule is applied to measure the induced current.

14) **A:** Magnetic field produced by a current carrying solenoid is independent of cross sectional area

R: Magnetic field inside the solenoid is uniform.

15) **A:** The value of current in ammeter is same independent of its position in the series electric circuit.

R: In a series combination of resistors current is same in every part of the circuit.

16) **A:** In a simple battery circuit the point of lowest potential is positive terminal of the battery.

R: The current flows towards the lower potential that is from positive to negative.

17) **A:** Wire A is thin in comparison to wire B of same material and same length, then resistance of wire A is greater than resistance of wire B.

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R: Resistivity of wire A is greater than resistivity of wire B.

18) A: A 200 W bulb glows with more brightness than 100 W bulb.

R: 100 W bulb has more resistance than 200 W bulb.

19) A: Myopia is due to increased converging power of the eye lens.

R: Myopia can be corrected by using spectacles made from concave lens.

20) A: Twinkling of stars is due to the fact that refractive index of the earth's atmosphere fluctuates.

R: Dispersion is due to Tyndall effect.

MCQs:

21) The power of lens is $-2D$. The focal length and type of lens will be:

(a) -50 cm, convex

(b) -50 cm, concave

(c) 50 cm, convex

(d) 50 cm, concave

22) A convex lens of focal length 10 cm is placed in contact with a concave lens of focal length 20 cm. The focal length of this combination of lenses will be

(a) $+10$ cm

(b) $+20$ cm

(c) -10 cm

(d) -20 cm

23) A child is standing in front of a magic mirror. She finds the image of her head bigger, the middle portion of her body of same size and that of the legs smaller. Which of the following is the order of combination of magic mirror from the top

(a) plane, convex and concave

(b) concave, plane and convex

(c) convex, plane and concave

(d) convex, concave and plane

24) The speed of light in a given medium is $\frac{2}{3}$ of its speed in vacuum. The absolute refractive index of the medium equals to

(a) $\frac{9}{4}$

(b) $\frac{4}{9}$

(c) $\frac{3}{2}$

(d) $\frac{2}{3}$

25) A ray passing through the centre of curvature of a concave mirror is inclined at an angle α° to its principal axis. The angle of reflection for this ray equals

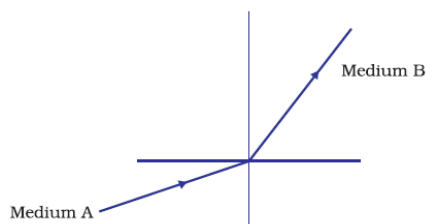
(a) 0°

(b) $\frac{\alpha}{2}^\circ$

(c) α°

(d) 90°

26) A ray of light enters from medium A to medium B as shown in figure. The refractive index of medium B relative to A will be



(a) greater than unity

(b) zero

(c) less than unity

(d) equal to unity

27) A 10 mm long pin is placed vertically in front of a concave mirror. A 5 mm long image of pin is formed at 30 cm in front of the mirror. The focal length of this mirror is

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(a)-30 cm

(b)-20 cm

(c)-40 cm

(d)-60 cm

28) Rays of light from sun converge at a point 15 cm in front of a concave mirror. Where should an object be placed so that the size of its image is equal to the size of the object?

(a) 15 cm in front of mirror

(b) 30 cm in front of mirror

(c) between 15 cm and 30 cm in front of mirror

(d) more than 30 cm in front of mirror

29) Which of the following can undergo nuclear fusion reaction?

(a) Uranium

(b) Deuterium

(c) Barium

(d) Boron

30) A piece of wire of resistance R is cut into 5 equal parts. These parts are then connected in parallel. The equivalent resistance of this combination is R' . The ratio of R/R' is

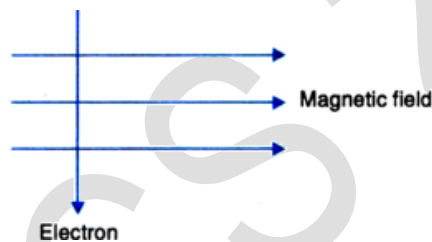
(a) $1/50$

(b) 25

(c) 5

(d) $1/5$

31) An electron beam enters a magnetic field at right angles to it as shown in figure. The direction of force acting on the electron beam will be



(a) to the left

(b) to the right

(c) into the page

(d) out of page

32) Potential difference between a live wire and neutral wire is

(a) 200 volt

(b) 150 volt

(c) 210 volt

(d) 220 volt

33) Moving part of an electric motor is called

(a) armature

(b) shaft

(c) split ring

(d) slip ring

34) A battery connected to a resistor supplies a current of 4 A. If another resistor of equal resistance is connected in parallel to the first resistor, then the current supplied by the battery will be

(a) 12 A

(b) 1 A

(c) 2 A

(d) 8 A

35) Focal length of eye lens is

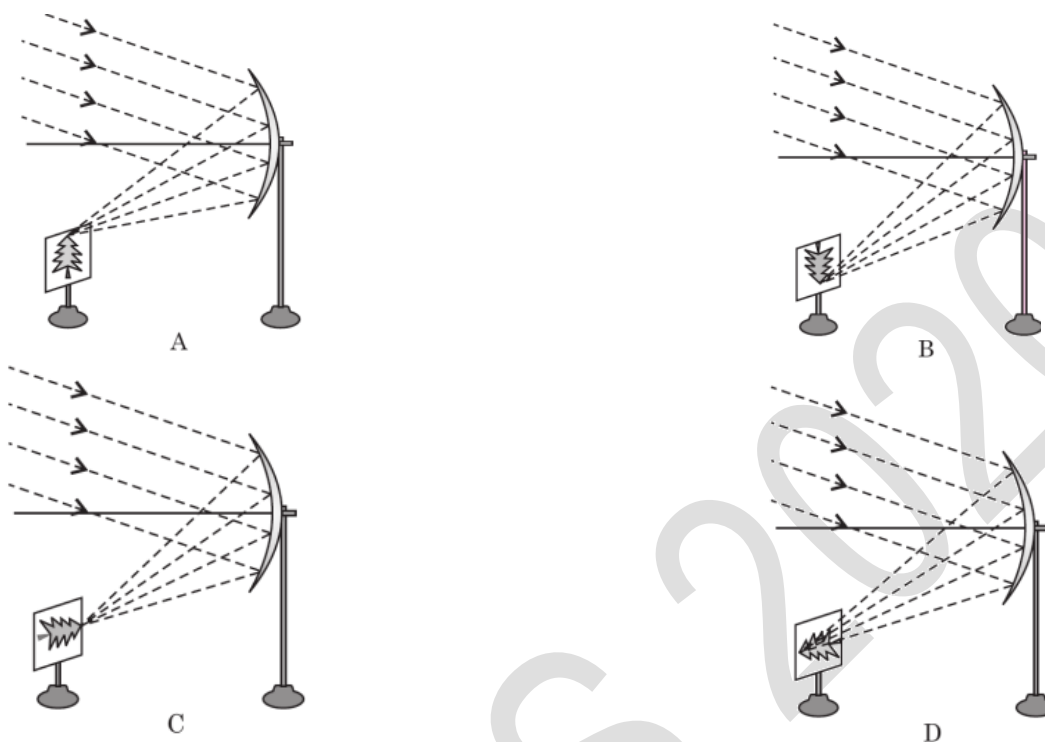
(a) fixed

(b) variable

(c) sometimes fixed and sometimes variable

(d) 25 cm

36) Parallel rays from the top of a distant tree incident on a concave mirror, form an image on the screen. Which of the given diagrams correctly shows the formation of image of the tree?



- 37)** A student obtains a blurred image of an object on a screen by using a concave mirror. In order to obtain sharp image on the screen, he will have to shift the mirror
- towards the screen
 - either towards or away from the screen depending upon the position of object
 - away from the screen
 - to a position very far away from screen
- 38)** If a mirror forms a virtual, erect image of the same size, then it should be a
- convex mirror
 - spherical mirror
 - plane mirror
 - cannot say
- 39)** For which colour, the refractive index of glass is maximum?
- red
 - violet
 - green
 - yellow
- 40)** An electric bulb rated 220 V and 100 W. When it is operated at 110 V, the power consumed will be
- 75 W
 - 100 W
 - 25 W
 - 50 W
- 41)** Red colour of sun during sunrise and sunset is due to
- red colour is least scattered
 - red colour is most scattered
 - blue colour is least scattered
 - all colours are equally scattered

 Answer Key:

- 7) A
- 8) A
- 9) C
- 10) A
- 11) C
- 12) A
- 13) B
- 14) B
- 15) A
- 16) D
- 17) C
- 18) A
- 19) B
- 20) C
- 21) B
- 22) B
- 23) B
- 24) C
- 25) A
- 26) A
- 27) B
- 28) B
- 29) B
- 30) C
- 31) D
- 32) D
- 33) B
- 34) D
- 35) B
- 36) B
- 37) B
- 38) C
- 39) B
- 40) C
- 41) A