

Exam ID.

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Candidates must write the Set No. on the title page of the OMR Sheet.

**DAV PUBLIC SCHOOLS, ODISHA ZONE-I
PA-II EXAMINATION, 2021-22**

- Check that this question paper contains 12 printed pages.
- Set number given on the right-hand side of the question paper should be written on the OMR SHEET by the candidate.
- Check that this question paper contains 60 questions.

CLASS - X

SUB : SCIENCE(086)

Time : 90 Minutes

Maximum Marks : 40

General Instructions:

1. The question paper comprises three sections – A, B and C.
2. Section A has 24 questions. Attempt any 20 questions.
3. Section B has 24 questions. Attempt any 20 questions.
4. Section C has 12 questions. Attempt any 10 questions
5. All questions carry equal marks.
6. There is no negative marking.
7. This question paper consists of a total of 60 questions.

SECTION – A

Section – A consists of 24 questions. Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

Q1. Which among the following statements is/are true? Exposure of silver chloride to sunlight for a long duration turns grey due to

(I) the formation of silver by decomposition of silver chloride.

(II) sublimation of silver chloride.

(III) decomposition of chlorine gas from silver chloride

(IV) oxidation of silver chloride.

(A) (I) Only

(B) (I) and (III)

(C) (II) and (III)

(D) Only (IV)

Q2. On prolonged supply of CO₂(g) in lime solution (lime-water), it is observed that

(A) lime solution changes to a gaseous state

(B) the milkiness of lime water disappears

- (C) the colour of lime water changes from white to red
(D) the colour of lime water becomes black

Q3. The correct order of increasing chemical reactivity of following the metals is:

- (A) $Zn < Fe < Mg < K$ (B) $Fe < Mg < Zn < K$
(C) $Fe < Mg < K < Zn$ (D) $Fe < Zn < Mg < K$

Q4. You are given aqueous solutions of ferrous sulphate, zinc sulphate, copper sulphate and aluminum sulphate. How will you identify these solutions on the basis of colour of their aqueous solutions?

- (A) all four solutions are colourless
(B) ferrous sulphate is light green, copper sulphate is blue, aluminum sulphate and zinc sulphate are both colourless
(C) ferrous sulphate and copper sulphate are both blue while aluminum sulphate and zinc sulphate are colourless
(D) all four solutions are greenish-blue in colour.

Q5. A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue?

- (A) Lemon juice (B) Vinegar (C) Common salt (D) An antacid

Q6. In the equation:



The values of x and y are:

- (A) 3 and 5 (B) 8 and 6 (C) 4 and 2 (D) 7 and 1

Q7. Barium chloride on reacting with ammonium sulphate forms barium sulphate and ammonium chloride. Which of the following correctly represents the type of reaction involved?

- (I) Displacement reaction (II) Precipitation reaction
(III) Combination reaction (IV) Double displacement reaction
(A) Only (I) (B) Only (II) (C) Only (IV) (D) (II) and (IV)

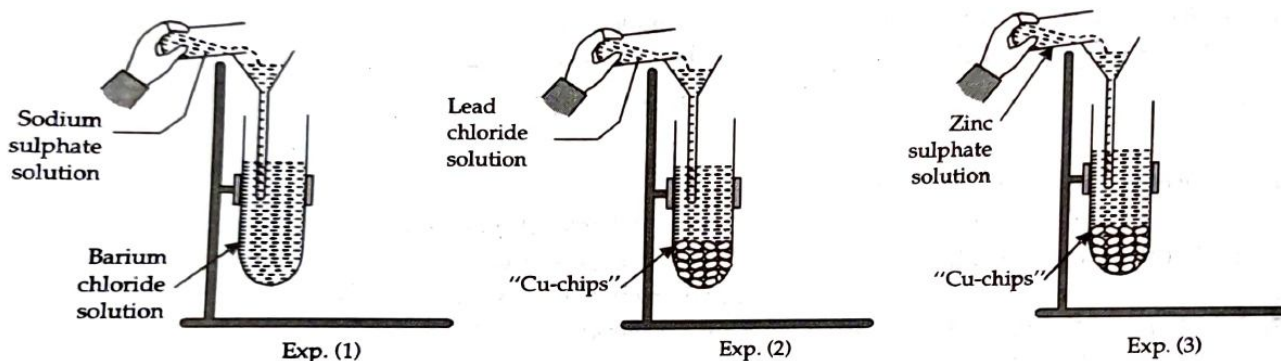
Q8. Which of the following phenomena occur, when a small amount of acid is added to water?

- (I) Ionisation (II) Neutralisation (III) Dilution (IV) Salt formation
(A) (I) and (II) (B) (I) and (III) (C) (II) and (III) (D) (II) and (IV)

Q9. Zinc granules on treating with an acid X, form zinc sulphate ($ZnSO_4$) salt along with the evolution of a gas Y, which burns with a pop sound when brought near to a burning candle. Identify acid X and gas evolved Y.

- (A) X-sulphuric acid and Y-oxygen gas
(B) X-hydrochloric acid and Y-oxygen gas
(C) X-sulphuric acid and Y-hydrogen gas
(D) X-hydrochloric acid and Y-hydrogen gas

Q10. Observe the experiment set-up carefully: In which experiment an insoluble precipitate is formed and of which substance?



- (A) Exp. 1, Na_2SO_4 (B) Exp. 2, CuCl_2
 (C) Exp. 3, CuSO_4 (D) Exp. 1, BaSO_4

Q11. During inspiration in man,

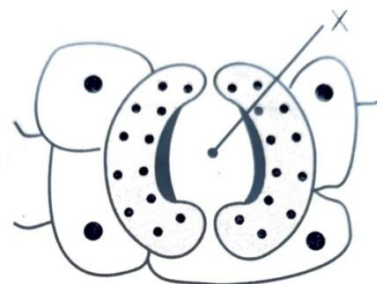
- (A) the internal intercostal muscles relax
 (B) due to contraction of external intercostal muscles and flattening of diaphragm, the volume of thoracic cavity increases
 (C) due to contraction of external intercostal muscles and flattening of diaphragm, the volume of thoracic cavity decreases
 (D) the abdominal muscles contract

Q12. If you chew on a piece of bread long enough, it begins to taste sweet because

- (A) maltose is formed by maltase
 (B) fatty acids are formed by lipase
 (C) disaccharides are formed by breaking down of starches by amylase
 (D) glucose is formed from disaccharides

Q13. If the structure marked X in the diagram given below is blocked, then which of the processes will not occur?

- (A) Transpiration and respiration
 (B) Transpiration, photosynthesis and respiration
 (C) Respiration, transpiration and transportation
 (D) Respiration and photosynthesis



Q14. A student noted the differences between blood and lymph in the following table. Select the row containing incorrect information:

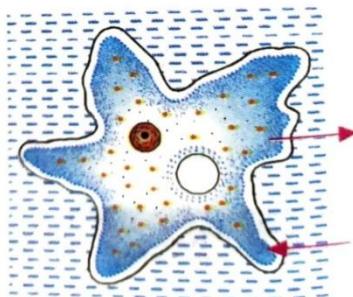
		BLOOD	LYMPH
a	Colour	Red due to presence only RBCs	Colourless due to the presence of only WBCs
b	Components	Plasma, RBC, WBC and platelets	Plasma and less number of WBCs
c	Other name	Also called tissue fluid	Also called extra cellular fluid
d	Flow	It flows through blood capillaries	It flows through arteries

- (A) a (B) b (C) c (D) d

Q15. If a man inhales carbon monoxide along with oxygen, he suffers from suffocation. It is because carbon monoxide

- (A) affects the muscles involved in breathing
- (B) affects nerves controlling breathing
- (C) forms a stable compound with oxygen
- (D) forms a stable compound with haemoglobin

Q16. What does the diagram depict ?



- (A) Gaseous exchange in amoeba
- (B) Formation of food vacuole
- (C) Formation of water vacuole
- (D) Throwing of waste from the body

Q17. The colour of the sky appears blue, it is due to the

- (A) blue light gets absorbed in the atmosphere.
- (B) ultra violet radiations are absorbed in the atmosphere.
- (C) violet and blue lights get scattered more than the lights of all other colours by the atmosphere.
- (D) light of all other colours is scattered more than the violet and blue colour lights by the atmosphere.

Q18. The image of an object is virtual, erect and magnified in size, if it is placed before

- (A) convex lens and convex mirror
- (B) convex lens and concave mirror
- (C) concave lens and concave mirror
- (D) concave lens and convex mirror

Q19. Which of the following lenses would you prefer to use while reading small letters found in a dictionary?

- (A) Convex lens of focal length 50 cm
- (B) A concave lens of focal length 50 cm
- (C) A convex lens of focal length 5 cm
- (D) A concave lens of focal length 5 cm.

Q20. Consider an object 7.0 cm in length which is placed at a distance of 20 cm in front of a convex mirror of radius of curvature 30 cm. The size and position of image formed are:

- (A) size of image = +3 cm, position of image = - 60 /7 cm
- (B) size of image = +3 cm, position of image = + 60/7 cm
- (C) size of image = +3 cm, position of image = +7/60 cm

(D) size of image = -3 cm, position of image = +7/60 cm

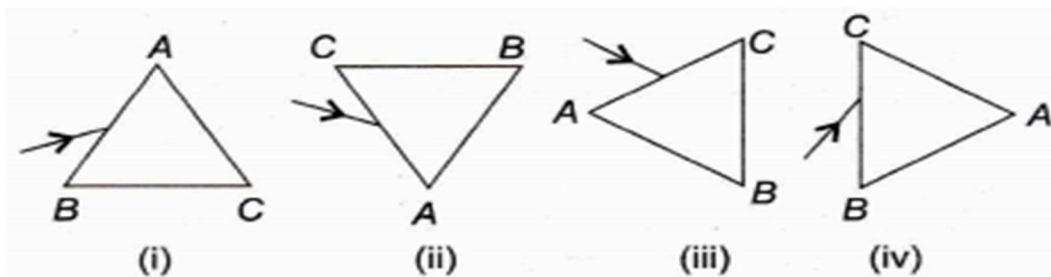
Q21. At noon the sun appears white as

- (A) its light is scattered the least.
- (B) all the colours of white light are scattered away.
- (C) blue colour is scattered the most.
- (D) red colour is scattered the most.

Q22. In torches, search light and headlights of vehicles, the bulb is placed

- (A) between the pole and the focus of the reflector.
- (B) very near to the focus of the reflector.
- (C) between the focus and centre of curvature of the reflector.
- (D) at the centre of curvature of the reflector.

Q23. A prism ABC (with BC as base) is placed in different orientations. A narrow beam of white light is incident on the prism as shown in Figure below. In which of the following cases, after dispersion the third colour from the top of the spectrum corresponds to the colour of the sky?



- (A) (i) (B) (ii) (C) (iii) (D) (iv)

Q24. During the experiment, to trace the path of ray of light through the glass prism, Students reported the following observations:

- (I) The ray of light from air to glass at the first refracting surface bends away from the normal after refraction.
- (II) At the second refracting surface, light rays entered from air to glass.
- (III) Light ray suffers two refractions on passing through a prism and in each refraction it bends towards the base of the prism.
- (IV) Light ray suffers two refractions on passing through a prism. In first refraction it bends away from the normal while in the second refraction it bends towards the normal.

The correct observation(s) is/are:

- (A) (I) and (II) only (B) (II) only (C) (II) and (IV) only (D) (I) and (IV) only

SECTION – B

Section – B consists of 24 questions. Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

Q25. One of the following does not happen during a chemical reaction. This is:

- (A) Breaking of old bonds and formation of new bonds
- (B) Formation of new substances with entirely different properties
- (C) Atoms of one element change into those of another element to form new products
- (D) A rearrangement of atoms takes place to form new products

Q26. Sodium hydrogen carbonate when added to acetic acid evolves a gas. Which of the following statements are true about the gas evolved?

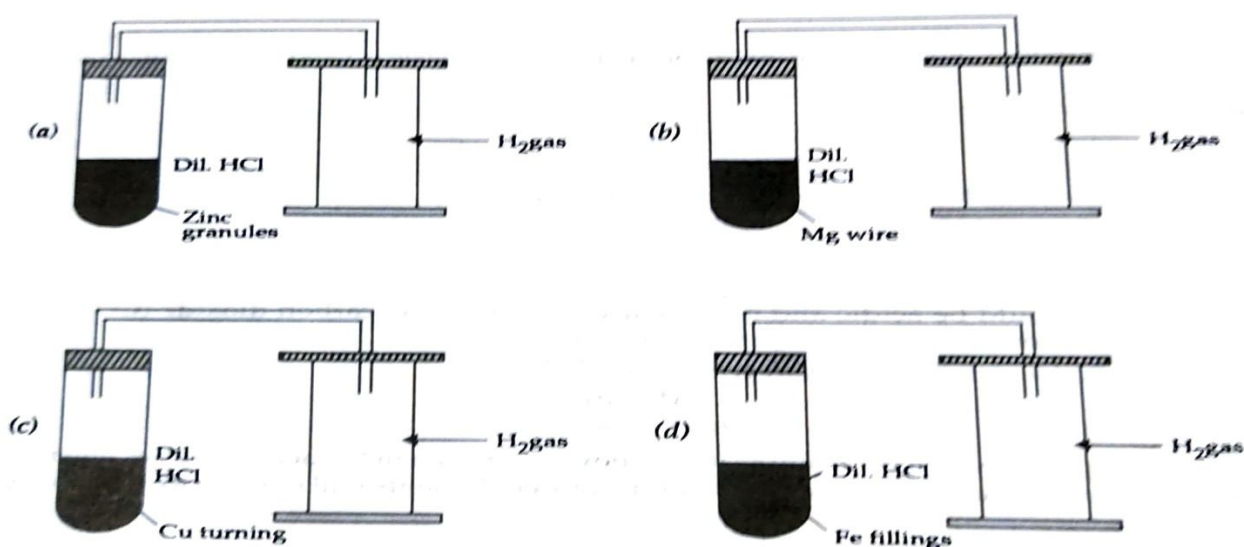
- (I) It turns lime water milky.
- (II) It extinguishes a burning splinter.
- (III) It dissolves in a solution of sodium hydroxide.
- (IV) It has a pungent odour.

- (A) (1) and (II)
- (B) (1), (II) and (III)
- (C) (II), (III) and (IV)
- (D) (1) and (IV)

Q27. The electronic configurations of three elements X, Y and Z are X---2,8 ; Y----2, 8, 7 and Z----2,8,2. Which of the following is correct?

- (A) X is a metal
- (B) Y is a metal
- (C) Z is a non-metal
- (D) Y is a non-metal and Z is a metal

Q28. Four experimental set-up are shown below. Rapid evolution of H₂ gas will be observed in which setup.



- (A) (a)
- (B) (b)
- (C) (c)
- (D) (d)

Q29. What happens when the solution of an acid is mixed the solution of a base in a test tube?

- (I) The temperature of the solution increases

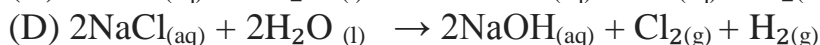
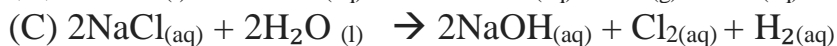
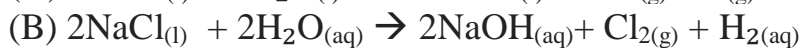
(II) The temperature of the solution decreases

(III) The temperature of the solution remains the same

(IV) Salt formation takes place

(A) Only (I) (B) (I) and (III) (C) (II) and (III) (D) (I) and (IV)

Q 30. Identify the correct representation of reaction occurring during chlor-alkali process.



Q 31. Plaster of paris is hardens by

(A) losing CaCl_2

(B) absorbing CO_2

(C) absorbing water

(D) releasing water

Questions No.32 to 35 consist of two statements – Assertion(A) and Reason(R). Answer the questions selecting appropriate option given below:

(A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(B) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(C) Assertion is true but Reason is false.

(D) Assertion is false but Reason is true.

Q 32. Assertion (A): The reaction of calcium oxide with water to produce slaked lime releasing a large amount of heat is a combination reaction.

Reason (R): Double displacement reactions are the reactions in which there is exchange of ions between the reactants.

Q 33. Assertion (A): Most minerals must enter the root by active absorption into the cytoplasm of epidermal cells.

Reason (R): The transportation needs energy in the form of ATP. Some ions also move into the epidermal cells, passively.

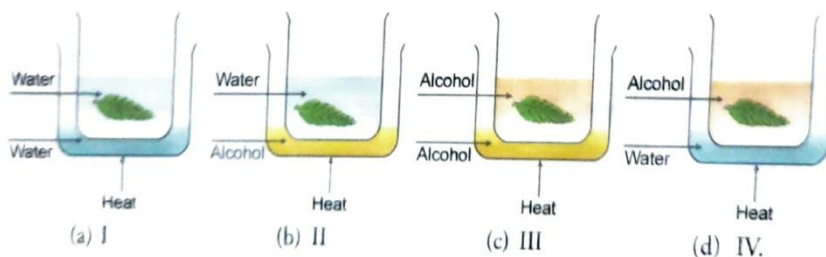
Q34. Assertion(A): The sun's disc appears to be flattened at sunrise and sunset.

Reason(R) : The sun is near the horizon at sunrise and sunlight suffers from atmospheric refraction.

Q35. Assertion (A): Metal oxides are acidic in nature.

Reason (R) : Calcium hydroxide solution reacts with carbon dioxide to form a salt and water.

Q36. Which among the following diagrams correctly depicts the removal of chlorophyll?



- (A) I and III both (B) IV only (C) II and IV both (D) II only

Q37. Match the contents of columns I, II, and III

Column I	Column II	Column III
(a) glucose	(i) blood capillaries	(p) amoeba
(b) exchange	(ii) food vacuole	(q) reabsorption
(c) pumping of blood	(iii) nephric filtrate	(r) one cell thick wall
(d) pseudopodia	(iv) ventricles	(s) thick walls

- (A) a- i- r, b- i- p, c- iv- q, d- ii- s (B) a- ii- q, b- i- p, c- iv- s, d- ii- r
 (C) a- iii- q, b- i- r, c- iv- s, d- ii- p (D) a- iv- s, b- i- r, c- iv- q, d- ii- p

Q38. The largest amounts of nitrogen is excreted from a mammalian body by

- (A) breath (B) sweat (C) urine (D) faeces

Q39. You are given water, glycerin, kerosene and a glass slab. In which of these media a ray of light incident obliquely at the same angle would bend the most?

- (A) Kerosene (B) Water (C) Glass slab (D) Glycerin

Q40. The absolute refractive indices of two transparent media A and B are $\frac{7}{4}$ and $\frac{4}{3}$ respectively. The refractive index of medium B with respect to A is

- (A) $\frac{7}{3}$ (B) $\frac{3}{7}$ (C) $\frac{21}{16}$ (D) $\frac{16}{21}$

Q41. Which of the following is the correct statement regarding bile?

- (A) It is secreted by bile duct and stored in liver.
 (B) It is secreted by gall bladder and stored in liver.
 (C) It is secreted by liver and stored in bile duct.
 (D) It is secreted by liver and stored in gall bladder.

Q42. Leaves are green because they

- (A) absorb green light (B) do not absorb green light
 (C) utilise green light (D) absorb and reflect green light.

Q43. The apparent depth of the fish in the water is

- (A) less than the actual depth because light travels from a rarer medium to denser medium.

- (B) more than the actual depth because light travels from a denser medium to rarer medium.
- (C) more than the actual depth because of the total internal reflection of light.
- (D) less than the actual depth because light travels from a denser medium to rarer medium.

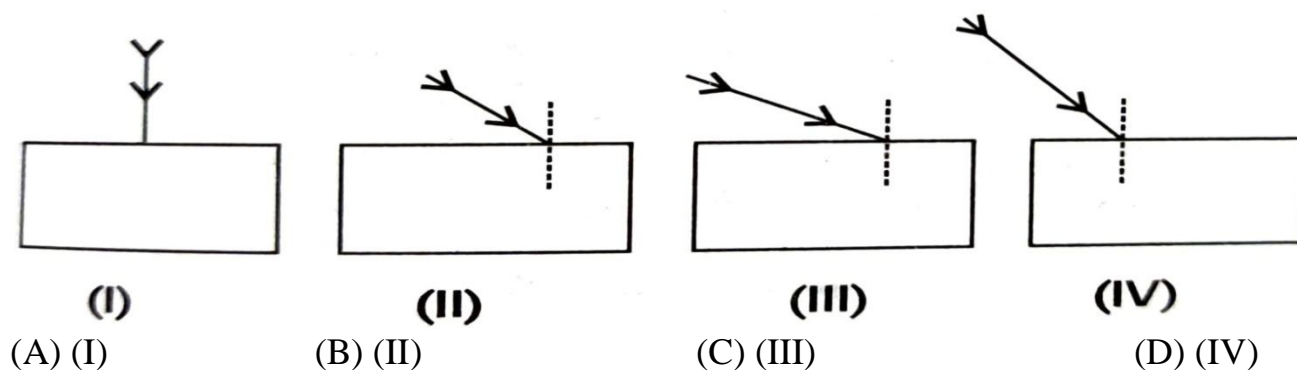
Q44. An object 50 cm tall is placed on the principal axis of a convex lens. Its 20 cm tall image is obtained on the screen placed at a distance of 10 cm from the lens. The focal length of the lens is

- (A) +7.14cm
- (B) +7.4cm
- (C) -25cm
- (D) +25cm

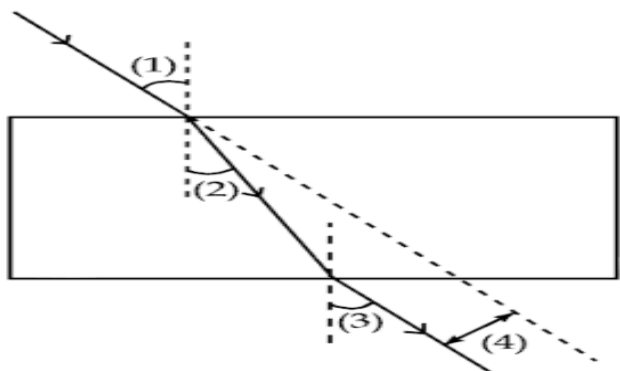
Q45. A ray of light continues moving along the same path while passing through air - water interface. The angle of refraction for the ray is

- (A) 0°
- (B) 45°
- (C) 90°
- (D) greater than 90°

Q46. Study the following four experimental setups by four students A, B, C and D showing the incident ray to trace the path of a ray of light through a glass slab. Which of these will get the best result?



Q47. A student has traced the path of a ray of light through a glass slab as follows. If you are asked to label 1, 2, 3 and 4, the correct sequencing of labeling $\angle i$, $\angle e$, $\angle r$ and lateral displacement respectively is



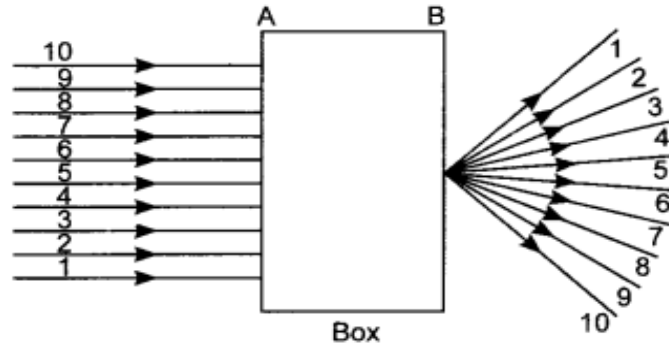
- (A) 2,1,3,4
- (B) 1,2,3,4
- (C) 1,3,2,4
- (D) 1,3,4,2

Q48. $Zn + H_2O$ (Steam) \rightarrow A + B, In the equation, A and B are:

- (A) Zn and H
- (B) ZnH_2 and O_2
- (C) ZnO_2 and O_2
- (D) ZnO and H_2

Read the following paragraph, study the given figure and answer the questions from 57 to 60.

A student was performing experiments to demonstrate some properties of light. He took a box of cardboard and made some holes on sides A and B. Then a beam of light was incident through the holes on side A and emerges out of the holes on the other face of the box as shown in Figure.



Q57. Which of the following could be inside the box placed by him to make the rays travel as shown?

- (A) Concave lens
- (B) Rectangular glass slab
- (C) Prism
- (D) Convex lens

Q58. If he brought two lenses L_1 and L_2 having power in the ratio 4: 1, what would be the ratio of the focal length of L_1 and L_2 ?

- (A) 4:1
- (B) 1:4
- (C) 2:1
- (D) 1:1

Q59. Where should he place an object in front of a concave lens to obtain a virtual image of the object?

- (A) infinity
- (B) principal focus
- (C) very close to the lens
- (D) any distance from the lens

Q60. He took an optical device to determine its focal length by focusing the image of the sun on a screen placed 24 cm from the device on the same side as the sun. Select the correct statement about the device.

- (A) Convex mirror of focal length 12 cm
- (B) Convex lens of focal length 24 cm
- (C) Concave mirror of focal length 24 cm
- (D) Convex lens of focal length 12 cm

***** ALL THE BEST *****