EHF

LEARNING FOR LIFE

EDUHEAL FOUNDATION

CLASS 11

LEVEL – 1

Set A1

EHF OLYMPIADS

• 4000 schools • 6 lakh students

• 10 olympiads • Global outreach

NIS

EHF NATIONAL INTERACTIVE SCIENCE OLYMPIAD

Name : .....

Roll No : .....

Class : .....

School : .....

art and cricket clinic contest

BSE international finance olympiad (BIFO)

NATIONAL IIT-PMT OLYMPIAD (NIPO)

Level - 1 : All Level-1 successful* participants will get certificate, apititude report and online subscription, and school toppers will be eligible for school hero medals.

Level - 2 : School toppers* will be selected for level-2-National level - online computer based interactive test held at exam centres all over India. Besides selection for level-3, winner will get merit certificate, medals, educational CDs, laptop, scholarship and other prizes. There is no level-2 in Art and Cricket.

Level - 3 : Toppers will qualify# for level-3-International level-where you will compete with students globally. Get selected for EHFs International Olympiad training camp. Only Indian organization giving students exposure to global competitions. Represent India & win laurels. Guidance by top scientists. Prizes ranges from cash (millions of $), gadgets, foreign trips, publicity, fame, scholarships, Internships, conference participation and more.

* # See prospectus/website for details

Instructions for the Candidate

1. You are allowed additional 10 minutes to fill the required details in the RESPONSE SHEET (OMR).
2. The question paper is made as per syllabus guidelines & pattern given in the information Booklet. The Question Paper for Classes 1 to 6 contains 25 Questions each to be answered in 40 minutes. The Question paper for classes 7 to 12 contains 50 Questions each to be answered in 60 minutes. All questions are compulsory. Further instructions are given in the instruction letter to the teacher.
3. Use the response sheet to mark your responses by darkening the required circle. The response sheet has to be returned to the foundation, duly filled in. THE STUDENT CAN RETAIN THE QUESTION PAPER.

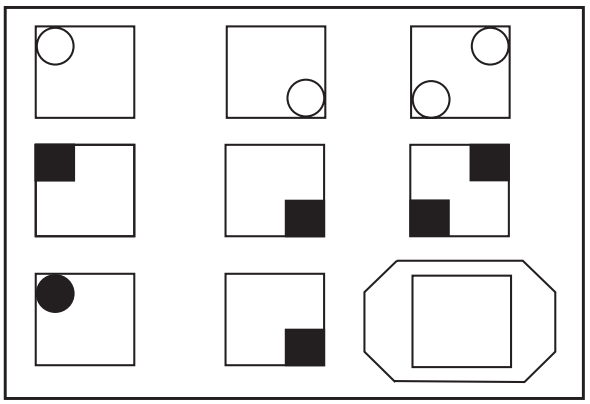
WEBSITE : WWW.EDUHEALFOUNDATION.ORG
E-MAIL : INFO@EDUHEALFOUNDATION.ORG

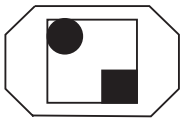
ROUGH WORK

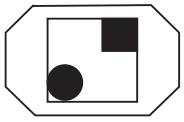
GENERAL IQ

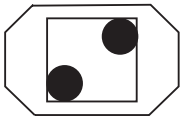
Directions (Q. 1 and Q. 2): For the following diagrams, select the item below it which would complete the pattern.

1.



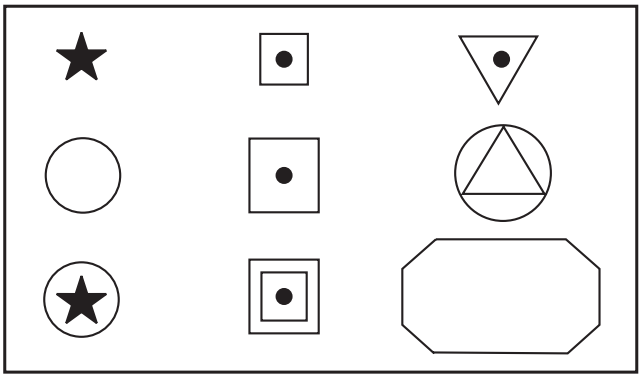
(1) 

(2) 

(3) 

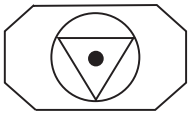
(4) None of these

2.



(1) 

(2) 

(3) 

(4) None of these

3. A fisherman has 5 fishes (namely A, B, C, D, E) each having a different weight.

(I) A weighs twice as much as B.

(II) B weighs four and a half times as much as C.

(III) C weighs half as much as D.

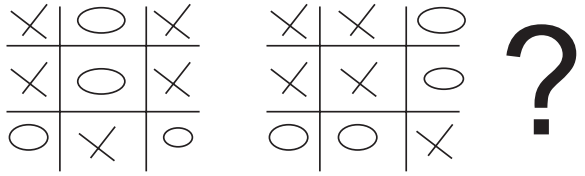
(IV) D weighs half as much as E.

(V) E weighs less than A but more than C.

(1) (I) (2) (II)

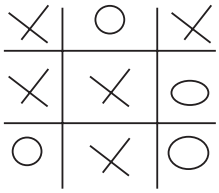
(3) (III) (4) None of these

4. Observe the pattern:

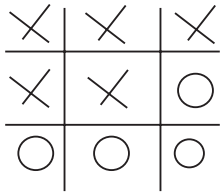


Which of these grids goes next?

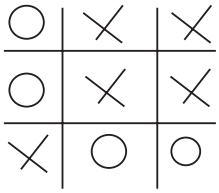
(1) The 1st grid



(2) The 2nd grid

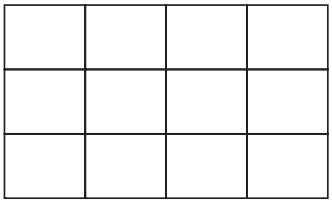


(3) The third grid



(4) None of these

5.



How many squares are there in this image?

(1) 20 (2) 52

(3) 18 (4) None of these

6. Which number should replace the question mark?

17	8	5	5
13	7	5	4
6	12	6	3
10	6	4	?

(1) 4 (2) 5
(3) 6 (4) None of these

7. 2, 10, 12, 60, 62, 310… What is next?
(1) 312
(2) 360
(3) 1550
(4) None of these

8. Find the answer that best completes the analogy.
People : Democracy : : Wealthy :
(1) Oligarchy
(2) Oligopoly
(3) Plutocracy
(4) None of these

9. Rearrange the following letters to make a word and choose the category in which it fits.
RAPETEKA
(1) City
(2) Fruit
(3) Bird
(4) None of these

10. 165135 is to peace as 1215225 is to
(1) lead
(2) love
(3) loop
(4) none of these

SECTION B: PHYSICS & CHEMISTRY

11. Which of the following optical phenomenon is used in cinematography or movie projectors?
(1) Accomodation
(2) Persistence of vision
(3) Interference
(4) None of these

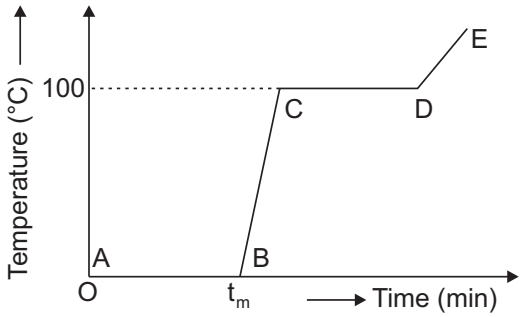
12. A free charged particle moves through a magnetic field. The particle may undergo a change in
(1) speed
(2) energy
(3) direction of motion
(4) none of these

13. A rectangular coil of copper wires is rotated in a magnetic field. The direction of the induced current changes once in each
(1) two revolutions
(2) one revolution
(3) half revolution
(4) none of these

14. Which power plant works on the basis of gravity of earth?
(1) Geothermal (2) Nuclear power
(3) Hydropower (4) None of these

15. Two bulbs marked 200 watt-250 volts and 100 watt-250 volts are joined in series to 250 volts supply. Power consumed in circuit is
(1) 33 watt (2) 67 watt
(3) 100 watt (4) None of these

16. Refer to the plot of temperature versus time showing the changes in the state of ice on heating (not to scale). Which of the following is correct?



(1) The region AB represents ice and water in thermal equilibrium.
(2) At B water starts boiling.
(3) At C all the water gets converted into steam.
(4) None of these

17. A lamp can work on a 50 volt mains taking 2 amps. What value of the resistance must be connected in series with it so that it can be operated from 200 volt mains giving the same power?

(1) 85 Ω

(2) 75 Ω

(3) 65 Ω

(4) None of these

18. Choose the incorrect statement regarding wind power:

(1) It is expected to harness wind power to minimum in open space.

(2) The potential energy content of wind blowing at high altitudes is the source of wind power.

(3) Wind hitting at the blades of a windmill causes them to rotate. The rotation thus achieved can be utilized further.

(4) None of these

19. "Diamonds are optically denser than water". State what this statement suggests about the relative speed of light in these two optical media.

(1) The speed of light is slower in diamonds than in water.

(2) The speed of light is higher in diamonds than in water.

(3) The speed of light is same in diamond and water.

(4) None of these

20. The far point of a myopic person is 80 cm in front of the eye. What is the nature and power of the lens required to correct the problem?

(1) A convex lens of power –1.25 D

(2) A concave lens of power –1.15 D

(3) A concave lens of power –1.25 D

(4) None of these

21. Metals have very low melting points, will melt if you keep them on your palm. Name them.

(1) Gallium

(2) Caesium

(3) Both (1) and (2)

(4) None of these

22. An element react with oxygen to give a compound with high melting points. This compound is also soluble in water. The element is likely to be:

(1) Calcium

(2) Carbon

(3) Silicon

(4) None of these

23. Which of the following is a decomposition reaction?

(1) $CO_2 + CaO \rightarrow CaCO_3$

(2) $C + CO_2 \rightarrow 2CO$

(3) $NH_4Cl \rightarrow NH_3 + HCl$

(4) None of these

24. What is incorrect about CuO, H_2, Cu and H_2O in a reaction?

$$CuO + H_2 \rightarrow Cu + H_2O$$

(1) Reduction of CuO takes place.

(2) Hydrogen is reducing agent.

(3) Hydrogen is reduced to H_2O.

(4) None of these

25. Which of the following statements is not correct?

(1) All metal carbonates react with acid to give a salt, water and carbon dioxide.

(2) All metal oxides react with water to give salt and acid.

(3) Some metals react with acids to give salt and hydrogen.

(4) None of these

26. Match the chemical substances given in Column (A) with their appropriate application given in Column (B):

Column A	Column B
(A) Bleaching powder	(i) Preparation of glass
(B) Baking soda	(ii) Production of H_2 and Cl_2
(C) Washing soda	(iii) Decolourisation
(D) Sodium chloride	(iv) Antacid

(1) A—(ii), B—(i), C—(iv), D—(iii)

(2) A—(iii), B—(ii), C—(iv), D—(i)

(3) A—(iii), B—(iv), C—(i), D—(ii)

(4) None of these

27. An organic compound A having molecular formula $C_2H_4O_2$ reacts with Sodium metal Na evolves a gas B which readily catches fire. A also reacts with Ethanol in the presence of concentrated Sulphuric acid to form a sweet smelling substance C in making perfumes. Identify the compounds A, B and C.

(1) A = Ethanoic acid, B = H_2, C = Ester

(2) A = Methanoic acid, B = H_2O, C = Ethanol

(3) A = Ethanoic acid, B = HCl, C = Ester

(4) None of these

28. Which of the following statements is correct about ethene?

(1) Ethene decolorizes the Reddish brown colour of Bromine water.

(2) Ethene gives a brisk effervescence with sodium hydrogen carbonate.

(3) Ethene forms curdy white precipitate or scum with hard water.

(4) None of these

29. An element which is an essential constituent of all organic compounds belongs to

(1) group 1

(2) group 14

(3) group 15

(4) none of these

30. Which of the following statements is correct?

(1) Hydrides of group 13 act as Lewis acids.

(2) Hydrides of group 14 are electron deficient hydrides.

(3) Hydrides of group 14 act as Lewis acids.

(4) None of these

SECTION C: MATHEMATICS

31. If d is the HCF of 45 and 27, find x and y satisfying $d = 27x + 45y$.

(1) $x = 3, y = 2$

(2) $x = 2, y = -1$

(3) $x = 4, y = 2$

(4) None of these

32. In a competition, one mark is awarded for every correct answer and half mark is deducted for every wrong answer. Jayanthi answered 120 questions and got 90 marks. How many questions did she answer correctly?

(1) 100 (2) 95

(3) 110 (4) None of these

33. Which term of the A.P. 92, 88, 84, 80, _____ is 0?

(1) 32 (2) 22

(3) 24 (4) None of these

34. If four vertices of a parallelogram taken in order are $(-3, -1)$, (a, b), (3, 3) and (4, 3). Then $a : b =$

(1) 1 : 4 (2) 4 : 1

(3) 1 : 2 (4) None of these

35. A tangent PQ at a point P of a circle of radius 7 cm meets a line through centre O at a point Q so that OQ = 25 cm and length PQ is

(1) 20 cm

(2) 14 cm

(3) 24 cm

(4) None of these

36. How many cubic centimetres of iron is required to construct an open box whose external dimensions are 36 cm, 25 cm and 16.5 cm provided the thickness of the iron is 1.5 cm?

(1) 3960 cm^3

(2) 4960 cm^3

(3) 5960 cm^3

(4) None of these

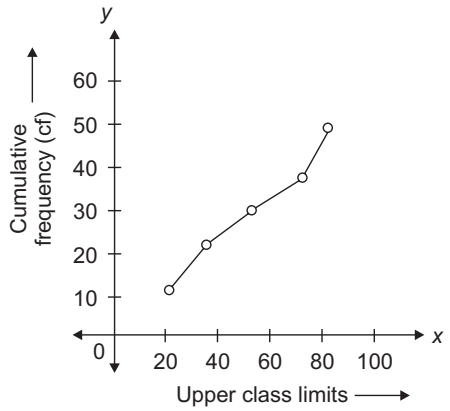
37. During the medical check-up of 35 students of a class, their weights were recorded as follows:

Weight (in kg)	Number of students
Less than 38	0
Less than 40	3
Less than 42	5

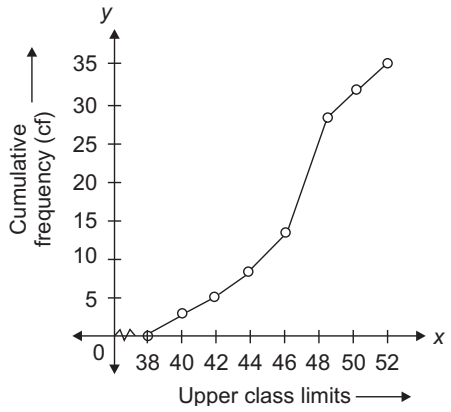
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

What is a less than type ogive for the given data?

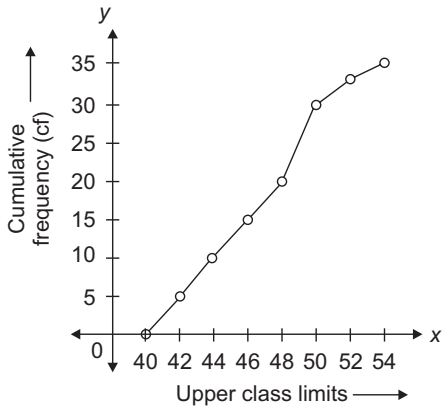
(1)



(2)



(3)



(4) None of these

38. A card is drawn from a pack of cards numbered 2 to 53. The probability that the number on the card is a prime number less than 20 is

(1) 2/13 (2) 4/13

(3) 5/13 (4) None of these

39. The value of tan 1°.tan 2°.tan 3° … tan 89° is

(1) 0 (2) 1

(3) 2 (4) None of these

40. Solve: $\sum_{r=1}^{n}(6r^2+4r-1)$

(1) $(2n^2 + 5n + 4)$ (2) $n(n + 2)(2n + 1)$

(3) $n(2n + 6)$ (4) None of these

SECTION C: BIOLOGY

31. Name an organ which is part of two body systems.

(1) Intestine

(2) Pancreas

(3) Lungs

(4) None of these

32. When you are balancing your bicycle, this action is controlled by which part of your brain?

(1) Cerebellum

(2) Cerebrum

(3) Pons

(4) None of these

33. Which among the following statements are true for unisexual flowers?

I. They possess both stamen and pistil.

II. They possess either stamen or pistil.

III. They exhibit cross pollination.

IV. Unisexual flowers possessing only stamens cannot produce fruits.

(1) I and IV

(2) III and IV

(3) II, III and IV

(4) None of these

34. The difference between Homo sapiens and the Homo erectus was _____.

(1) Homo sapiens originated in Africa while Homo erectus was in Asia.

(2) The size of the brain of Homo erectus was smaller to homo sapiens.

(3) Homo erectus stayed in Africa while Homo sapiens did not.

(4) None of these

35. In a lake polluted with pesticides, which one of the following will contain the maximum amount of pesticides?

(1) Small fish

(2) Microscopic animals

(3) Water birds

(4) None of these

36. _____ was a predecessor of Darwin's and developed the theory of acquired characteristics.

(1) Lamarck

(2) Malthus

(3) Mendel

(4) None of these

37. Name the process in which a harmful chemical enters the food chain and gets concentrated at each level in the food chain.

(1) Concentration

(2) Biomagnification

(3) Expansion

(4) None of these

38. The role of HCl in our stomach is

(1) Acidifies food for the action of Pepsin.

(2) Digestion of fat

(3) Digestion of protein

(4) None of these

39. In reflex action, the reflex arc is formed by _____.

(1) muscles – effector – brain

(2) receptor – spinal cord – muscles

(3) muscles – receptor – brain

(4) none of these

40. Which region is called the region of "MEGADIVERSITY"?

(1) Region near Antarctic circle.

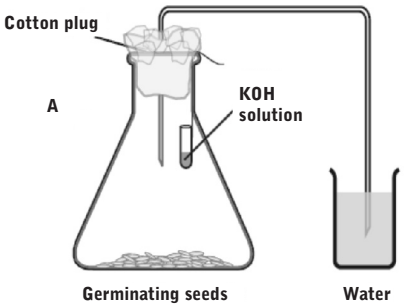
(2) Region between Tropic of Cancer and Capricorn.

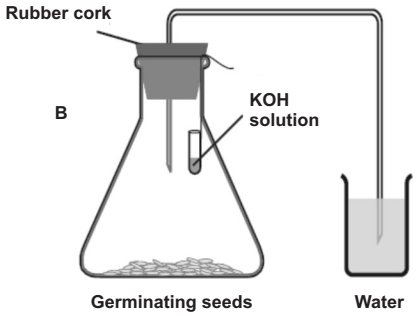
(3) Region near Arctic circle.

(4) None of these

INTERACTIVE SECTION

41. Using the same number of given germinating gram seeds, two students A and B set up the experiment separately. Student A used a cotton plug to hold the bent tube in the mouth of the flask. Student B used a rubber cork.





After 4 hours they noticed that

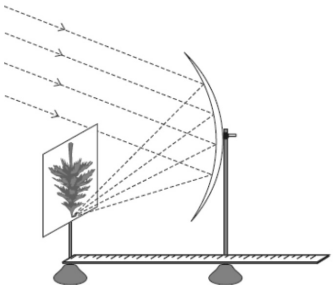
(1) water level increased in the bent tube only of A.

(2) water level increased in the bent tube only of B.

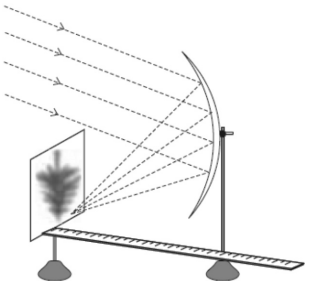
(3) the cotton plug was wet.

(4) none of these

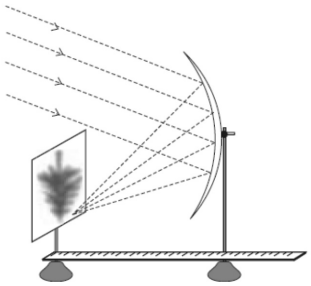
42. Four students A, B, C and D carried out measurements of focal length of a concave mirror as shown in the four diagrams.



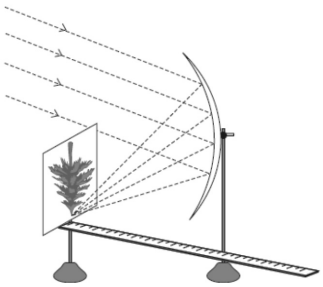
A



B



C



D

The best result will be obtained by student

(1) A

(2) B

(3) C and A

(4) None of these

43. Students A, B and C were given five raisins each of equal weight. The raisins were soaked in distilled water at room temperature. A removed the raisins after 20 minutes, B after two hours and C after 40 minutes. If P_A, P_B and P_C denote percentage absorption of water obtained by students A, B and C respectively, then

(1) $P_A > P_B > P_C$.

(2) $P_A < P_B < P_C$.

(3) $P_A < P_B > P_C$.

(4) None of these

44. Given below are the steps in the preparation of a temporary mount of a stained leaf peel.

(i) Cover the material with the cover slip.

(ii) Transfer the stained peel to the clean glass slide and add a drop of glycerine.

(iii) Remove the peel from the ventral surface of the leaf.

(iv) Drop it in the water in a petri dish and add a drop of safranin stain.

The correct sequence of steps is

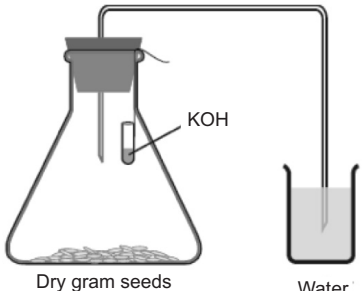
(1) (iii), (iv), (ii), (i).

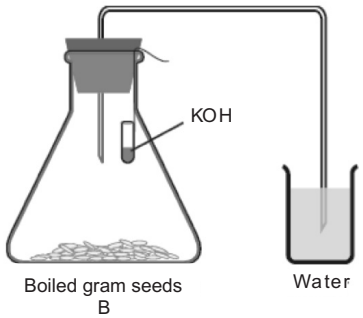
(2) (i), (ii), (iii), (iv).

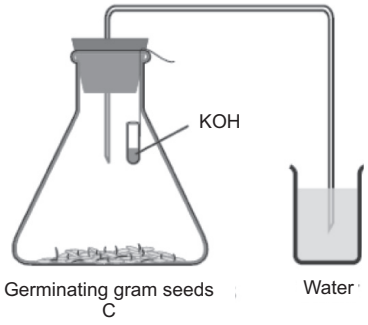
(3) (ii), (iii), (iv), (i).

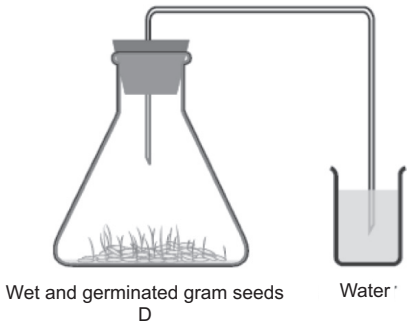
(4) None of these

45. Given below are four different set ups to show that CO_2 is released during respiration.









The set up that will give the desired result is

(1) A

(2) B and D

(3) C

(4) None of these

46. A converging lens has a focal length of 60 cm. If an object is placed 40 cm from the lens, where will the image be formed and what will be its nature?

(1) A real and erect image will be formed on the opposite side of object.

(2) A virtual and erect image will be formed on the same side of the object.

(3) A real and inverted image will be formed on the same side of the object.

(4) None of these

47. Rajat observed the leaf of peepal tree and spines of a cactus plant and categorized them as

(1) analogous

(2) homologous

(3) rudimentary

(4) none of these

48. Which of the following hypotheses is written correctly?

(1) If I heat up a tennis ball it will bounce high.

(2) If I freeze a tennis ball, then it will not bounce as high.

(3) Frozen tennis balls will bounce as high.

(4) None of these

49. A student identified the various parts of an embryo of a gram seed and listed them as given below:

I. Testa II. Plumule

III. Radicle IV. Cotyledon

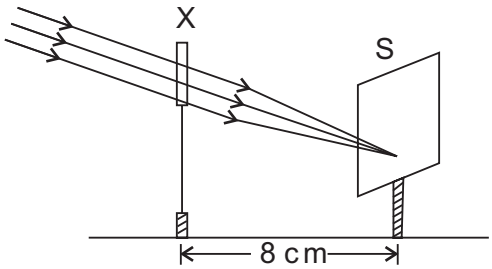
V. Tegmen

Out of these the actual parts of the embryo are

(1) I, II, III (2) II, III, IV

(3) III, IV, V (4) None of these

50. A student used a device (X) to obtain/focus the image of a well illuminated distant building on a screen (S) as shown below in the diagram. Select the correct statement about the device (X).



(1) This device is a concave lens of focal length 8 cm.

(2) This device is a convex mirror of focal length 8 cm.

(3) This device is a convex lens of focal length 8 cm.

(4) None of these

END OF THE EXAM