



PHYSICS

BOOKS - HT Olympiad Previous Year Paper

NSO QUESTION PAPER 2019-20 SET B

Science

1. Which of the following statements is/are always true regarding a converging lens?

I. When the object approaches the focal point from the converging lens, then the size of the image increases.

II. The image formed by a thick converging lens is brighter to that formed by a thin converging lens.

III. When the object is placed very far away from the lens, the image distance approaches focal length.

A. I and II only

B. I and III only

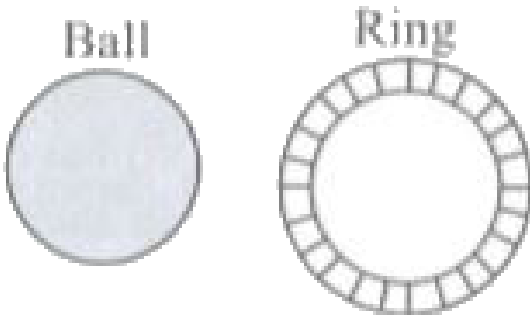
C. I, II and III

D. III only

Answer: D

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2. Consider the figures of a metal ball and a metal ring given here.



The metal ball can just pass through the metal ring. If the metal ring is heated, then

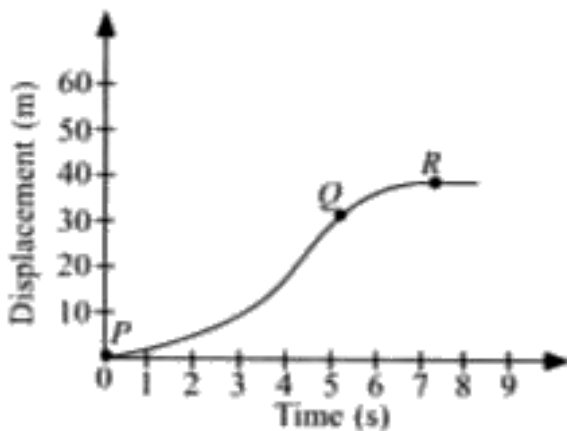
- A. The ball will pass through it and there is no change in the shape of the ring
- B. The ball will pass through it and the diameter of ring increases
- C. The ball gets stuck and the diameter of the ring decreases
- D. None of these.

Answer: B



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3. The displacement-time graph of a lift climbing from the ground floor to the top of the building is given here.



Which of the following statements are true about the graph?

I. At point P, the lift is stationary.

II. The lift is slowing down from point Q to point R.

III. At point R, the lift is at rest.

A. I and III only

B. II and IV only

C. I, II and III only

D. II, III and IV only

Answer: C



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4. Which of the following statements is/are correct regarding the instrument cup anemometer?

I. It is used to measure the speed of the wind.

II. The hollow metallic cups in it are used to increase the speed of the wind.

III. The number of revolutions made by cups is directly proportional to the speed of the wind.

A. I only

B. I, II and III

C. I and III only

D. None of these

Answer: C



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5. On a new scale of temperature (which is linear) and called the W scale. The freezing and boiling points of water are $39^\circ W$ and $239^\circ W$ respectively. What will be the temperature on the new scale, corresponding

to a temperature of $39^{\circ}C$ on the Celsius scale?

A. $200^{\circ}W$

B. $139^{\circ}W$

C. $78^{\circ}W$

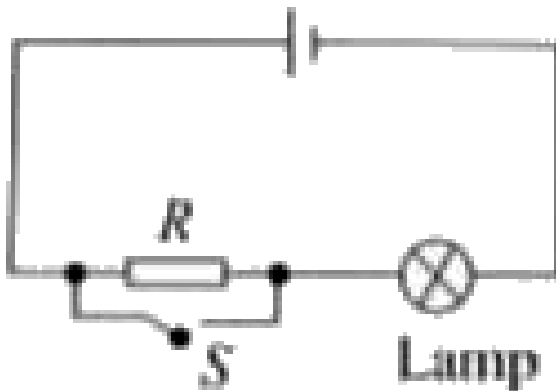
D. $117^{\circ}W$

Answer: D



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6. What happens to the brightness of the lamp when the switch S is closed?



-
- A. It becomes dimmer.
 - B. It becomes brighter.
 - C. It goes off.
 - D. It remains the same.

Answer: B



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7. (A): Electric appliances with metallic body have three connections, whereas an electric bulb has a two pin connection.

(R): Three pin connections reduce heating of connecting wires.

A. Both statements 1 and 2 are true and statement 2 is the correct explanation of

statement 1.

B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.

C. Statement 1 is true but statement 2 is false.

D. Both statements 1 and 2 are false.

Answer: C



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8. When an object is made to float in two different liquids of densities d_1 and d_2 , the length of the object seen above the liquid surface are 4 cm and 5 cm respectively. Which of the following is the correct alternative?

A. $d_1 > d_2$

B. $d_1 < d_2$

C. $d_1 = d_2$

D. None of these

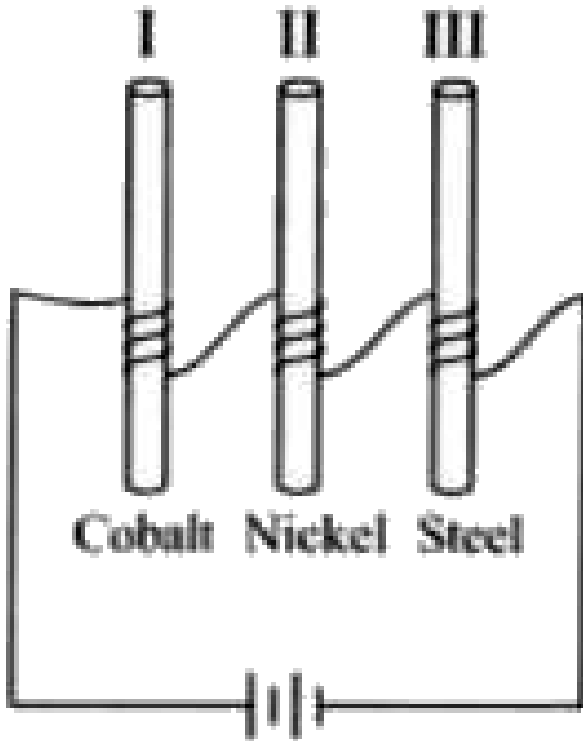
Answer: B



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9. The diagram shows three rods made of different materials placed inside different coils. Which of the rods will not show any

polarity (in context of magnetism)?



A. I

B. II

C. III

D. None of these

Answer: D



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10. If the tension in the string of a guitar is increased keeping other factors unchanged, then which of the following statements is/are incorrect?

I. The sound produced is louder.

II. The sound produced has higher pitch.

III. The sound produced has lower pitch.

A. II only

B. I only

C. I and III only

D. I, II and III

Answer: C



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11. A block of ice in which a piece of stone is embedded is floating on water contained in a beaker. When all the ice melts the level of water in the beaker

A. Remains unchanged

B. Rises

C. Falls

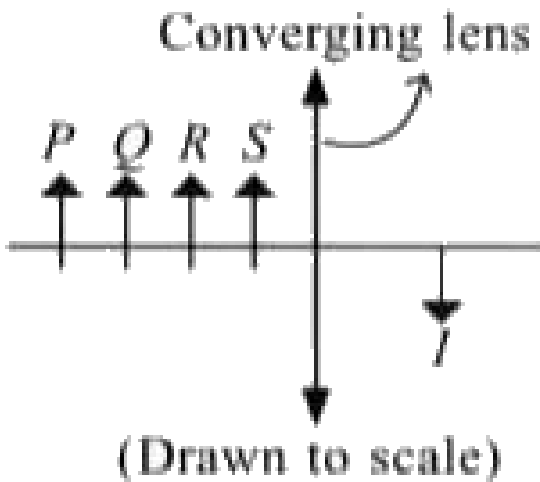
D. Falls in the beginning and rises to the same level later.

Answer: C



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12. Which of the following objects can form the image I?



A. P

B. Q

C. R

D. S

Answer: C



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13. If air and cloud were good conductors of electricity, do you think lightning could occur?

Explain.

A. Lightning could occur with higher intensity

B. Lightning could occur with lower intensity

C. Lightning could not occur at all

D. None of these.

Answer: C



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14. Match column I with column II and select the correct option from the given codes.

Column I	Column II
(a) Jupiter	(i) Its density is less than that of water.
(b) Saturn	(ii) Red planet
(c) Mars	(iii) Spins slowly in the opposite direction with respect to most planets.
(d) Neptune	(iv) Spins so fast that a day lasts only under 10 hours
(e) Venus	(v) Fourteen moons

- A. (a) - (iv), (b) - (i), (c) - (v), (d) - (iii), (e) - (ii)
- B. (a) - (i), (b) - (ii), (c) - (v), (d) - (iv), (e) - (iii)
- C. (a) - (iv), (b) - (v), (c) - (iii), (d) - (ii), (e) - (i)
- D. (a) - (iv), (b) - (i), (c) - (ii), (d) - (v), (e) - (iii)

Answer: D



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15. Whenever the surfaces in contact tend to move or move with respect to each other, the force of friction comes into play

- A. Only if the objects are solid
- B. Only if one of the two objects is a liquid
- C. Only if one of the two objects is a gas

D. Irrespective of whether the objects are solid, liquid or gas.

Answer: D

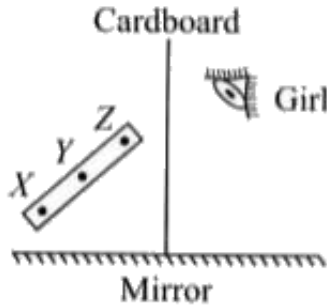


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Achievers Section

1. The figure shows a girl viewing a rod placed in front of a plane mirror. When the cardboard is removed vertically upwards, which points

will be seen first and last by her?



	Seen first	Seen last
A.	X	Z
B.	Y	X
C.	Z	X
D.	X	Y



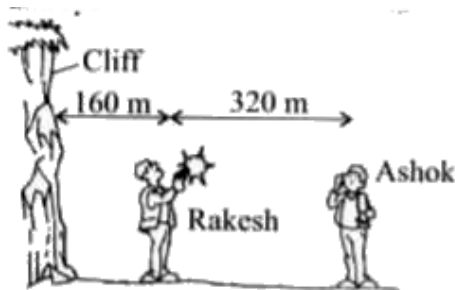
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2. Raksh fires a gun 160 m from a cliff. Ashok who is standing 320 m further away from the cliff hears the gunshot (i) _____ second after

he sees the flash. Ashok and Rakesh will hear the echo from the cliff (ii) _____ second and (iii) _____ second respectively after (iv) _____ the (v) _____.

Speed of sound = 320 m/s (approximate)

and speed of light = $3 \times 10^8 \text{ m/s}$



	(i)	(ii)	(iii)	(iv)	(v)
A.	1	2	1	Seeing	Flash
B.	1	2	1	Hearing	Gunshot
C.	2	1	2	Hearing	Gunshot
D.	1	1.5	1	Seeing	Flash



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