



PHYSICS

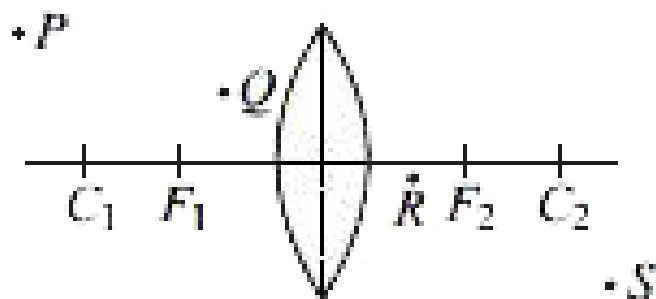
BOOKS - HT Olympiad Previous Year Paper

NSO QUESTION PAPER 2016 SET A

Science

1. The given figures shows a converging lens .
The focal length and centre of curvature of the

lens are marked along with four random points P, Q, R and S.



Which of the following set of points correctly represents the position of object and corresponding position of image?

	Position of object	Position of image
A.	P	R
B.	Q	S
C.	P	S
D.	Q	P



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2. Two resistance wires of the same material and of equal lengths and equal diameters are connected in series in a simple electric circuit consisting of a voltage source of voltage V . Now, the same wires are connected in parallel in the same circuit for the same time but voltage source is replaced by another voltage source of voltage $2V$. The ratio of heat produced in the two cases is

A. 1:1

B. 1:4

C. 1: 8

D. 1: 16

Answer: D



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3. A train starting from rest at one station, accelerates uniformly and attains a speed v after sometime. After travelling at this speed for sometime, it retards uniformly and stops at the next station. If R be the uniform

resistance of the given track and the duration of the uniform motion is just half the total journey time, the average power supplied by the train engine is

A. $\frac{vR}{2}$

B. $\frac{3vR}{2}$

C. $\frac{3vR}{4}$

D. $\frac{vR}{4}$

Answer: C



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4. Two plane mirrors are inclined to each other at some angle. A ray of light is incident on one of them at an angle of 35° . The light after reflection falls on the second mirror and gets reversed. The angle between the mirrors is

A. 17.5°

B. 35°

C. 52.2°

D. 70°

Answer: B



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5. Two identical spheres of radius R , made of a material of density ρ , are in contact with each other. If the gravitational attraction between them is F , then

A. $F \propto \frac{\rho^2}{R^2}$

B. $F \propto \rho^2 R^4$

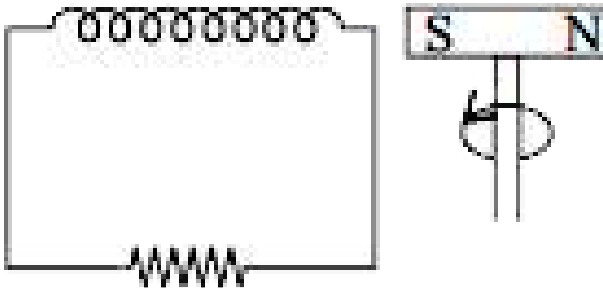
C. $F \propto \frac{\rho^4}{R^6}$

$$D. F \propto \rho^4 R^4$$

Answer: B

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6. A bar magnet is rotated on a shaft near to a coil which is connected to a resistor of resistance R as shown in the figure.



Which of the following changes does not increase the induced current in the coil?

A. Moving the magnet closer to the coil.

B. Turning the magnet in the opposite direction at the same speed.

C. Turning the magnet in the opposite direction at a greater speed.

D. Using a coil with more turns.

Answer: B



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7. Read the given statements and select the correct option.

Statement 1 : 1 atomic mass unit is equivalent to about 931 mega electron volts of energy.

Statement 2: 1 electron volt = 1.602×10^{-13} joule

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. A body is thrown vertically upward in air and air resistance is taken into account. The time of ascent is t_1 , and time of descent is t_2 , then which of the following is true ?

A. $t_1 = t_2$

B. $t_1 > t_2$

C. $t_1 < t_2$

D. cannot be predicted

Answer: C



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9. A disc of mass 10 g is kept floating horizontal in the air by firing bullets, each of mass 5g, with the same velocity at the same rate of 10 bullets per second. The bullets rebound with the same speed in positive direction . The velocity of each bullet at the time of impact is (Take $g = 9.8ms^{-2}$)

A. $1ms^{-1}$

B. $5ms^{-1}$

C. $10ms^{-1}$

D. $100ms^{-1}$

Answer: A



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10. Which of the following statements is/are correct?

(i) The ratio of the speed of light to the speed of sound is called the Mach number.

(ii) Speed of sound increases with increase in

temperature.

(iii) For hearing a distinct echo, the minimum distance of the obstacle from the source of sound should be 34.4 m.

(iv) Wavelength of sound audible to human lies between 17 mm to 17 m.

A. (iii) only

B. (ii) and (iv) only

C. (i),(iii) and (iv) only

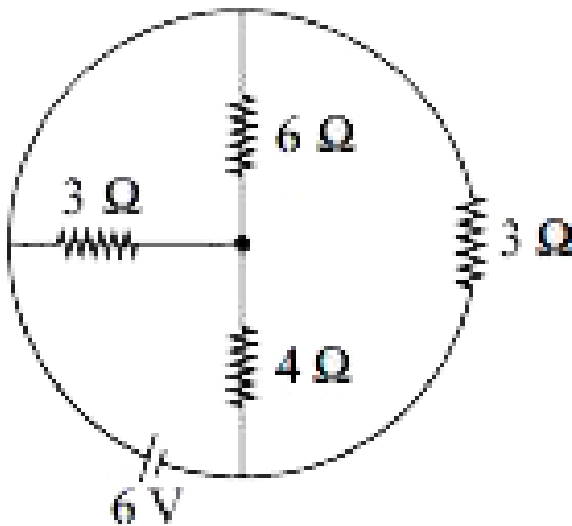
D. (i),(ii) , (iii) and (iv)

Answer: B



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11. In the given circuit, the total current supplied by the battery is



A. 1A

B. 2A

C. 3A

D. 6A

Answer: C



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12. A long-sighted person cannot see objects clearly at a distance less than 40 cm from his eye. The power of the lens needed to read an object at 25 cm is

A. $-2.5D$

B. $+2.5D$

C. $-6.25D$

D. $+1.5D$

Answer: D



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