

**JEE Main January 2026**  
**Question Paper With Text Solution**  
**24 January | Shift-2**

**PHYSICS**



JEE Main & Advanced | XI-XII Foundation | VI-X Pre-Foundation

Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911  
Website : [www.matrixedu.in](http://www.matrixedu.in) ; Email : [smd@matrixacademy.co.in](mailto:smd@matrixacademy.co.in)

---

**JEE MAIN JANUARY 2026 | 24 JANUARY SHIFT-2****SECTION - A**

Question ID : 444792634

26. A moving coil galvanometer of resistance  $100\Omega$  shows a full scale deflection for a current of  $1\text{ mA}$ . The value of resistance required to convert this galvanometer into an ammeter, showing full scale deflection for a current of  $5\text{ mA}$ , is \_\_\_\_\_  $\Omega$ .

क

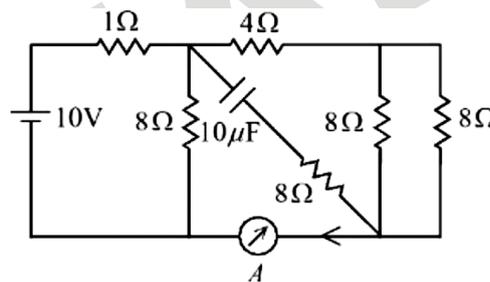
- (1) 2.5                      (2) 0.5                      (3) 25                      (4) 10

**Ans.** Official answer NTA (3)**Sol.**

Question ID : 444792645

27. The reading of the ammeter (A) in steady state in the following circuit (assuming negligible internal resistance of the ammeter) is \_\_\_\_\_ A.

क



- (1) 1                      (2) 0                      (3) 2                      (4) 1/2

**Ans.** Official answer NTA (1)**Sol.**

Question ID : 444792642

28. When a light of a given wavelength falls on a metallic surface the stopping potential for photoelectrons is  $3.2\text{ V}$ . If a second light having wavelength twice of first light is used, the stopping potential drops to  $0.7\text{ V}$ . The wavelength of first light is \_\_\_\_\_ m.

$$(h = 6.63 \times 10^{-34}\text{ J.s, } e = 1.6 \times 10^{-19}\text{ C, } c = 3 \times 10^8\text{ m/s})$$

क

- (1)  $2.5 \times 10^{-7}$                       (2)  $3.1 \times 10^{-7}$                       (3)  $2.9 \times 10^{-8}$                       (4)  $2.2 \times 10^{-8}$

**Ans.** Official answer NTA (1)**Sol.****MATRIX JEE ACADEMY****Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911****Website : www.matrixedu.in ; Email : smd@matrixacademy.co.in**



Question ID : 444792626

29. In a vernier callipers, 50 vernier scale divisions are equal to 48 main scale divisions. If one main scale division = 0.05 mm, then the least count of the vernier callipers is \_\_\_\_\_ mm.

क

- (1) 0.05                      (2) 0.005                      (3) 0.002                      (4) 0.02

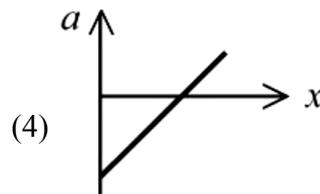
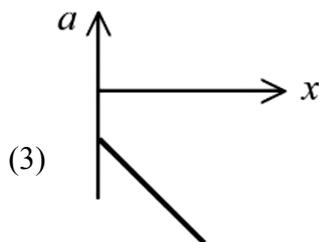
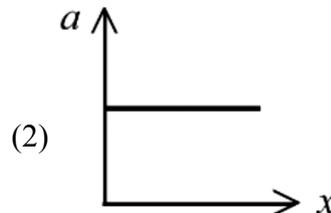
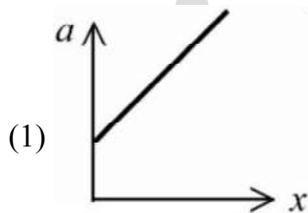
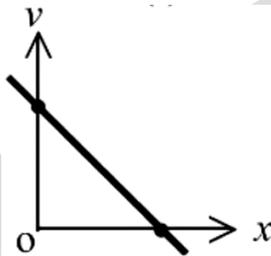
**Ans.** Official answer NTA (3)

**Sol.**

Question ID : 444792628

30. The velocity ( $v$ ) – Distance ( $x$ ) graph is shown in figure. Which graph represents acceleration ( $a$ ) versus distance ( $x$ ) variation of this system?

क



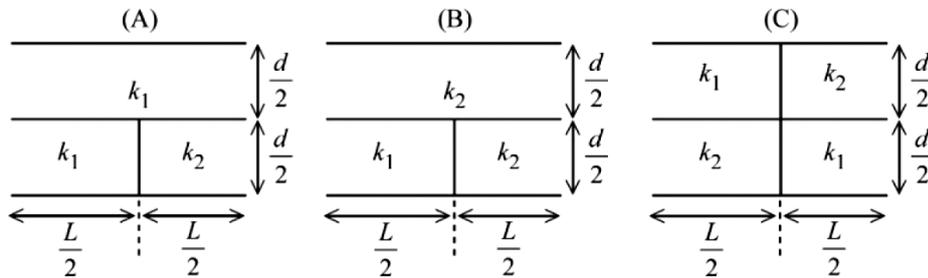
**Ans.** Official answer NTA (4)

**Sol.**



Question ID : 444792637

31. Three parallel plate capacitors each with area  $A$  and separation  $d$  are filled with two dielectric ( $k_1$  and  $k_2$ ) in the following fashion. Which of the following is true? ( $k_1 > k_2$ )



क

- (1)  $C_A > C_C > C_B$       (2)  $C_C > C_B > C_A$       (3)  $C_C > C_A > C_B$       (4)  $C_B > C_C > C_A$

**Ans.** Official answer NTA (1)

**Sol.**

Question ID : 444792629

32. A flexible chain of mass  $m$  hangs between two fixed points at the same level. The inclination of the chain with the horizontal at the two points of support is  $30^\circ$ . Considering the equilibrium of each half of the chain, the tension of the chain at the lowest point is \_\_\_\_\_ .

क

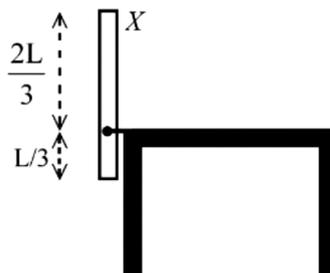
- (1)  $\frac{\sqrt{3}}{2}mg$       (2)  $\frac{1}{2}mg$       (3)  $\sqrt{3}mg$       (4)  $mg$

**Ans.** Official answer NTA (1)

**Sol.**

Question ID : 444792627

33. A thin uniform rod (X) of mass  $M$  and length  $L$  is pivoted at a height  $(L/3)$  as shown in the figure. The rod is allowed to fall from a vertical position and lie horizontally on the table. The angular velocity of this rod when it hits the table top, is \_\_\_\_\_. ( $g$  = gravitational acceleration)



**MATRIX JEE ACADEMY**

Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911  
Website : www.matrixedu.in ; Email : smd@matrixacademy.co.in



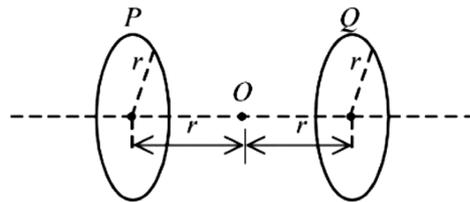
क

- (1)  $\sqrt{\frac{3g}{L}}$       (2)  $\frac{3}{\sqrt{2}}\sqrt{\frac{g}{L}}$       (3)  $\frac{1}{\sqrt{2}}\sqrt{\frac{g}{L}}$       (4)  $\sqrt{\frac{3g}{2L}}$

**Ans.** Official answer NTA (1)**Sol.**

Question ID : 444792635

34. Two identical circular loops P and Q each of radius  $r$  are lying in parallel planes such that they have common axis. The current through P and Q are  $I$  and  $4I$  respectively in clockwise direction as seen from O. The net magnetic field at O is :



क

- (1)  $\frac{\mu_0 I}{4\sqrt{2}r}$  towards Q      (2)  $\frac{\mu_0 I}{4\sqrt{2}r}$  towards P      (3)  $\frac{3\mu_0 I}{4\sqrt{2}r}$  towards P      (4)  $\frac{3\mu_0 I}{4\sqrt{2}r}$  towards Q

**Ans.** Official answer NTA (4)**Sol.**

Question ID : 444792631

35. A cubical block of density  $\rho_b = 600 \text{ kg / m}^3$  floats in a liquid of density  $\rho_e = 900 \text{ kg / m}^3$ . If the height of block is  $H = 8.0 \text{ cm}$  then height of the submerged part is \_\_\_\_\_ cm.

क

- (1) 4.3      (2) 7.3      (3) 5.3      (4) 6.3

**Ans.** Official answer NTA (3)**Sol.**

Question ID : 444792641

36. Distance between an object and three times magnified real image is 40 cm . The focal length of the mirror used is \_\_\_\_\_ cm.

क

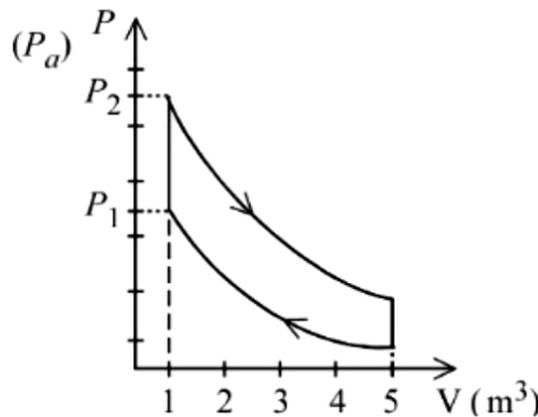
- (1) -15      (2) -20      (3) -15/2      (4) -10

**Ans.** Official answer NTA (1)

**Sol.**

Question ID : 444792632

37. 10 mole of an ideal gas is undergoing the process shown in the figure. The heat involved in the process from  $P_1$  to  $P_2$  to  $\alpha$  Joule ( $P_1 = 21.7 \text{ Pa}$  and  $P_2 = 30 \text{ Pa}$ ,  $C_v = 21 \text{ J / K.mol}$ ,  $R = 8.3 \text{ J / mol.K}$ ). The value of  $\alpha$  is



क

(1) 28

(2) 24

(3) 15

(4) 21

**Ans.** Official answer NTA (4)**Sol.**

Question ID : 444792639

38. Five persons  $P_1, P_2, P_3, P_4$  and  $P_5$  recorded object distance ( $u$ ) and image distance ( $v$ ) using same convex lens having power +5 D as (25,96), (30,62), (35,37), (45,35) and (50,32) respectively. Identify correct statement

क

(1) Readings recorded by  $P_4$  and  $P_5$  persons are incorrect(2) Readings recorded by  $P_3$  person are incorrect(3) Readings recorded by  $P_3$  and  $P_2$  persons are incorrect

(4) Readings recorded by all persons are correct

**Ans.** Official answer NTA (2)**Sol.**





Question ID : 444792638

41. A point source is kept at the center of a spherically enclosed detector. If the volume of the detector increased by 8 times, the intensity will

क

- (1) increase by 8 times (2) decrease by 4 times  
(3) decrease by 8 times (4) increase by 64 times

**Ans.** Official answer NTA (2)**Sol.**

Question ID : 444792640

42. In the Young's double slit experiment the intensity produced by each one of the individual slits is  $I_0$ . The distance between two slits is 2 mm. The distance of screen from slits is 10 m. The wavelength of light is  $6000 \text{ \AA}$ . The intensity of light on the screen in front of one of the slits is \_\_\_\_\_.

क

- (1)  $\frac{I_0}{2}$  (2)  $4I_0$  (3)  $2I_0$  (4)  $I_0$

**Ans.** Official answer NTA (4)**Sol.**

Question ID : 444792633

43. The fifth harmonic of a closed organ pipe is found to be in unison with the first harmonic of an open pipe. The ratio of lengths of closed pipe to that of the open pipe is  $5x$ . The value of  $x$  is \_\_\_\_\_.

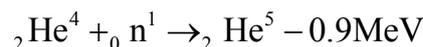
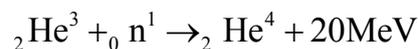
क

- (1) 1 (2) 2 (3) 3 (4) 4

**Ans.** Official answer NTA (2)**Sol.**

Question ID : 444792643

44. The binding energy for the following nuclear reactions are expressed in MeV.



If  $X_3, X_4, X_5$  denote the stability of  ${}_2\text{He}^3, {}_2\text{He}^4$  and  ${}_2\text{He}^5$ , respectively, then the correct order is :

क

- (1)  $X_4 > X_5 > X_3$  (2)  $X_4 = X_5 = X_3$  (3)  $X_4 < X_5 < X_3$  (4)  $X_4 > X_5 < X_3$

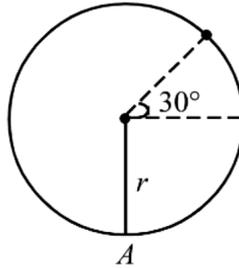


**Ans.** Official answer NTA (1)

**Sol.**

Question ID : 444792630

45. In case of vertical circular motion of a particle by a thread of length  $r$  if the tension in the thread is zero at an angle  $30^\circ$  shown in figure, the velocity at the bottom point (A) of the circular path is (gravitational acceleration)



क

(1)  $\sqrt{\frac{7}{2}gr}$

(2)  $\sqrt{\frac{5}{2}gr}$

(3)  $\sqrt{5gr}$

(4)  $\sqrt{4gr}$

**Ans.** Official answer NTA (1)

**Sol.**

### SECTION - B

Question ID : 444792649

46. A uniform solid cylinder of length  $L$  and radius  $R$  has moment of inertia about its axis equal to  $I_1$ . A small co-centric cylinder of length  $L/2$  and radius  $R/3$  carved from this cylinder has moment of inertia about its axis equals to  $I_2$ . The ratio  $I_1/I_2$  is

क

**Ans.** Official answer NTA (162)

**Sol.**

Question ID : 444792647

47. When 300 J of heat given to an ideal gas with  $C_p = \frac{7}{2}R$  its temperature raises from  $20^\circ\text{C}$  to  $50^\circ\text{C}$  keeping its volume constant. The mass of the gas is (approximately) \_\_\_\_\_ g.  
( $R = 8.314\text{J/mol.K}$ )

क

### MATRIX JEE ACADEMY

Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911

Website : www.matrixedu.in ; Email : smd@matrixacademy.co.in



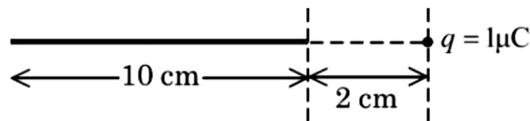
**Ans.** Official answer NTA (481)

**Sol.**

Question ID : 444792646

48. A point charge  $q = 1\mu\text{C}$  is located at a distance 2 cm from one end of a thin insulating wire of length 10 cm having a charge  $Q = 24\mu\text{C}$ , distributed uniformly along its length, as shown in figure. Force between

$q$  and wire is \_\_\_\_\_ N.  $\left( \text{Use : } \frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ N.m}^2 / \text{C}^2 \right)$



क

**Ans.** Official answer NTA (90)

**Sol.**

Question ID : 444792650

49. In a meter bridge experiment to determine the value of unknown resistance, first the resistances  $2\Omega$  and  $3\Omega$  are connected in the left and right gaps of the bridge and the null point is obtained at a distance  $l$  cm from the left. Now when an unknown resistance  $x\Omega$  is connected in parallel to  $3\Omega$  resistance, the null point is shifted by 10 cm to the right of wire. The value of unknown resistance  $x$  is  $\Omega$ .

क

**Ans.** Official answer NTA (6)

**Sol.**

Question ID : 444792648

50. A soap bubble of surface tension  $0.04 \text{ N/m}$  is blown to a diameter of  $7 \text{ cm}$ . If  $(15000 - x)\mu\text{J}$  of work is done in blowing it further to make its diameter  $14 \text{ cm}$ , then the value of  $x$  is \_\_\_\_\_.

क

**Ans.** Official answer NTA (11304)

**Sol.**