Resonance® Educating for better tomorrow

TARGET : NEET (UG) 2024

Course : SARANSH (Youtube Live CRASH COURSE)

PHYSICS

DPP

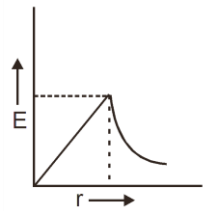
DAILY PRACTICE PROBLEMS

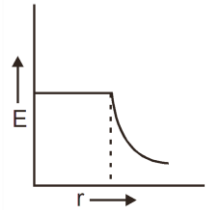
DPP NO. 2

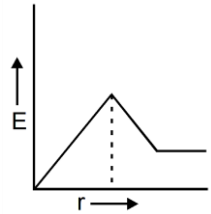
PHYSICS: ELECTROSTATICS

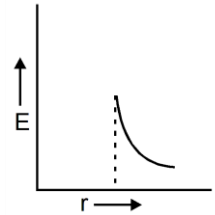
DPP No. : 2

1. Which of the following represents the correct graph for electric field intensity and the distance r from the centre of a hollow charged metal sphere or solid metallic conductor of radius R :

(1) 

(2) 

(3) 

(4) 

2. A particle A has charge +q and particle B has charge + 4q with each of them having the same mass m. When allowed to fall from rest through same electrical potential difference, the ratio of their speed $v_A : v_B$ will be :

(1) 2 : 1 (2) 1 : 2 (3) 4 : 1 (4) 1 : 4

3. The dimensions of $\left(\frac{1}{2}\right)\varepsilon_0 E^2$ (ε_0: permittivity of free space; E: electric field) are: **[JEE 2000 Scr.,3/105]**

(1) MLT^{-1} (2) ML^2T^{-2} (3) MLT^{-2} (4) $ML^{-1}T^{-2}$

4. A, B and C are three points in a uniform electric field. The electric potential is :

(1) maximum at B (2) maximum at C

(3) same at all the three points A, B and C (4) maximum at A

5. If potential (in volts) in a region is expressed as V(x, y, z) = 6 xy – y + 2yz, the electric field (in N/C) at point (1, 1, 0) is :

(1) $-(6\hat{i}+5\hat{j}+2\hat{k})$ (2) $-(2\hat{i}+3\hat{j}+\hat{k})$ (3) $-(6\hat{i}+9\hat{j}+\hat{k})$ (4) $-(3\hat{i}+5\hat{j}+3\hat{k})$

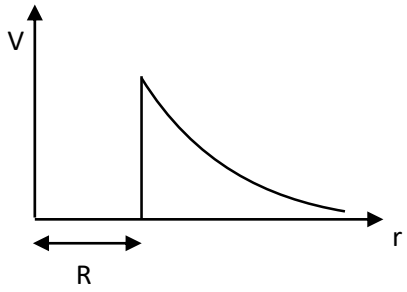
6. When an α-particle of mass 'm' moving with velocity ' v ' bombards on a heavy nucleus of charge 'Ze' its distance of closet approach from the nucleus depends on m as :

(1) m (2) $\frac{1}{m}$ (3) $\frac{1}{\sqrt{m}}$ (4) $\frac{1}{m^2}$

7. An electron falls from rest through a vertical distance h in a uniform and vertically upward directed electric field E. The direction of electric field is now reversed, keeping its magnitude the same. A proton is allowed to fall from rest in it through the same vertical distance h. The time of fall of the electron, in comparison to the time of falls of the proton is :

(1) smaller (2) equal (3) 10 times greater (4) 5 times greater

8. The variation of electrostatic potential with radial distance r from the centre of a positively charged metallic thin shell of radius R is given by the graph

(1)


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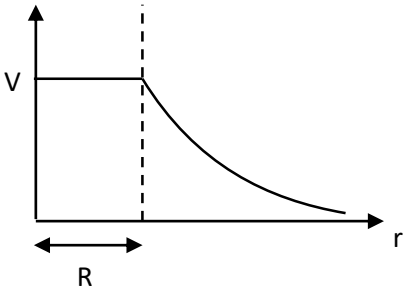

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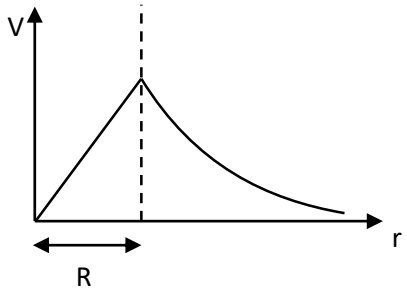

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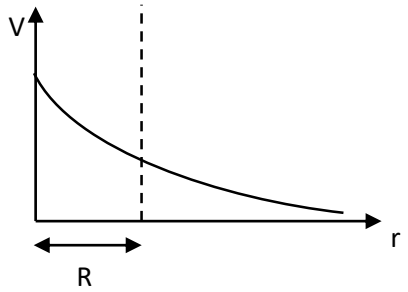
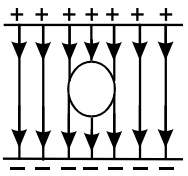


9. An uncharged sphere of metal is placed in a uniform electric field produced by two large conducting parallel plates having equal and opposite charges, then lines of force look like

(1)


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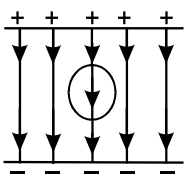

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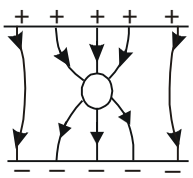

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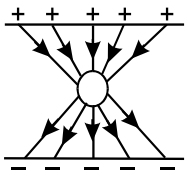

10. Two spherical conductors A and B of radii 1 mm and 2mm are separated by a distance of 5 cm and are uniformly charged. If the spheres are connected by a conducting wire then in equilibrium condition, the ratio of the magnitude of the electric fields at the surfaces of sphere A and B is :

(1) 2 : 1 (2) 1 : 4 (3) 4 : 1 (4) 1 : 2