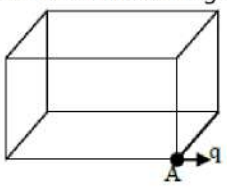
Physics Sample Paper - 1

DIRECTIONS for the question: *Mark the best option:*

Question No. : 1

The total flux through the faces of the cube with side of length 'a' if a charge q is place at corner A of the cube is:-



A) $\frac{q}{8\epsilon_0}$ B) $\frac{q}{4\epsilon_0}$ C) $\frac{q}{2\epsilon_0}$ D) $\frac{q}{\epsilon_0}$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 2

Electric field lines provides information about

A) Field strength B) Direction C) Nature of charge D) All of these

DIRECTIONS for the question: *Mark the best option:*

Question No. : 3

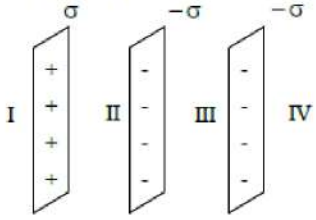
Unit of electric dipole moment is:-

A) Newton B) Coulomb C) Farad D) Debye

DIRECTIONS for the question: *Mark the best option:*

Question No. : 4

What is the net electric field due to informally charged infinite sheet in region – III?



A) $\frac{\sigma}{\epsilon_0}$ B) $\frac{\sigma}{2\epsilon_0}$ C) $\frac{2\sigma}{\epsilon_0}$ D) $\frac{\sigma}{4\epsilon_0}$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 5

Which of the following is true about electrostatic force?

A) It is non-conservative B) It is always attractive C) It is weaker than gravitational force
D) It depends on nature of the medium

DIRECTIONS for the question: *Mark the best option:*

Question No. : 6

When a charged sphere A of charge "q" is touched with another identical charged sphere B of charge '2q', what is the net charge on both spheres after some time?

A) 3q B) 3q/2 C) q D) 4q

DIRECTIONS for the question: *Mark the best option:*

Question No. : 7

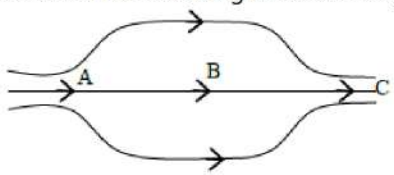
Two forces of magnitude 'F' are acting on a charge q perpendicularly, which is the resultant force on charge 'q'?

A) $F/2$ B) $F/\sqrt{2}$ C) $F\sqrt{2}$ D) $F\sqrt{3}$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 8

Which of the following is correct for given filed lines?



A) $E^A > E^B > E^C$ B) $E^A = E^B < E^C$ C) $E^A = E^B > E^C$ D) $E^A = E^B = E^C$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 9

Two charges of magnitudes – 2Q and +Q are located at points (a, 0) & (4a, 0) respectively. What is the electric flux due to these charges through a sphere of radius '3a' with its centre at the origin?

A) Q/ϵ_0 B) $-Q/\epsilon_0$ C) $2Q/\epsilon_0$ D) $-2Q/\epsilon_0$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 10

What is the electric flux due to electric dipole enclosed inside a closed spherical surface?

A) $\frac{\sigma}{\epsilon_0}$ B) $\frac{q}{\epsilon_0}$ C) Zero D) $\frac{\sigma}{2\epsilon_0}$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 11

What is the dimensional formula for electric field:

A) $[ML^2T^{-3}A^{-1}]$ B) $[MLT^{-3}A^{-1}]$ C) $[MLT^{-3}A^{-2}]$ D) $[MLT^{-2}A^{-1}]$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 12

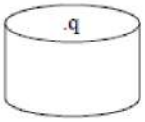
Which of the following is correct for electric field due to uniformly charged infinite length of wire of charge density λ?

A) $\frac{\lambda}{2\pi E_0 r}$ B) $\frac{\lambda}{4\pi E_0 r}$ C) $\frac{2\lambda}{\pi E_0 r}$ D) $\frac{\lambda}{8\pi E_0 r}$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 13

What is the electric flux due to this charge configuration through hemisphere surface?



A) $\frac{q}{E_0}$ B) $\frac{q}{4E_0}$ C) $\frac{q}{2E_0}$ D) Zero

DIRECTIONS for the question: *Mark the best option:*

Question No. : 14

Electric field lines due to single positive charge is

A) Radially inwards B) Radially outwards C) Converging D) Diverging

DIRECTIONS for the question: *Mark the best option:*

Question No. : 15

What is the electric dipole moment of dipole of length 10cm & consisting of charges 100 ± μC?

A) 10^{-5}cm B) 2×10^{-5}cm C) 3×10^{-5}cm D) 4×10^{-5}cm

DIRECTIONS for the question: *Mark the best option:*

Question No. : 16

What is the correct expression for electric field due to uniformly charged circular ring of radius 'a' & at a distance x from its centre?

A) $\frac{1}{4\pi E_0}\frac{qx}{(x^2+a^2)^{3/2}}$ B) $\frac{1}{4\pi E_0}\frac{qx}{(x^2-a^2)^{3/2}}$ C) $\frac{1}{4\pi E_0}\frac{qx}{(x^2+a^2)^{2}}$ D) $\frac{1}{4\pi E_0}\frac{qx}{(x^2+a^2)}$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 17

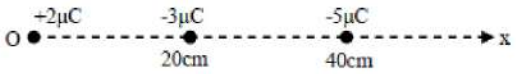
If a positive charge particle is moving in direction of electric field, it will

A) Accelerate B) Deaccelerate C) Stop moving D) Precess parabola

DIRECTIONS for the question: *Mark the best option:*

Question No. : 18

In which direction, force acts on the particle placed at origin in the given configuration



A) Left B) Right C) Upward D) Downward

DIRECTIONS for the question: *Mark the best option:*

Question No. : 19

What is the amount of charged carried by 12.5×10^8 electrons?

A) $2 \times 10^{-10}C$ B) $3 \times 10^{-10}C$ C) $4 \times 10^{-10}C$ D) $5 \times 10^{-10}C$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 20

A point charge q is rotated along a circle in the electric field, generated by another point charge Q. The work alone by electric field on rotating charge in one complete revaluation is,

A) zero B) Position C) Negative D) May be positive or negative

DIRECTIONS for the question: *Mark the best option:*

Question No. : 21

If the flow of electric field through a closed surface is zero

A) The electric field must be zero everywhere on the surface B) the electric filed may be zero everywhere on the surface
C) charges inside the surface must be zero D) charges in the vicinity of the surface must be zero

DIRECTIONS for the question: *Mark the best option:*

Question No. : 22

A non- conduction solid sphere of radius R is uniformly charged. The magnitude of the electric field due to the sphere at a distance from its centre

A) increase as r increases for $r < R$ B) decrease as r increase for $0 < r < \infty$ C) decrease as r increase for $R < r < \infty$
D) is discontinuous at $r = R$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 23

The magnitude of electric filed $\vec{E}$ in the annular region of a charged cylindrical capacity

A) is same through B) is higher near the outer cylinder than near the inner cylinder
C) varies as 1/r, where r is the distance from axis D) varies as $1/r^2$, where r is the distance from axis

DIRECTIONS for the question: *Mark the best option:*

Question No. : 24

Two charge particles each housing charge q and mass m are d distance about from each other. If the particles are in equilibrium under the gravitational and electric force, then determine the ratio q/m,

A) 10^{-8} B) 10^{-10} C) 10^{10} D) None

DIRECTIONS for the question: *Mark the best option:*

Question No. : 25

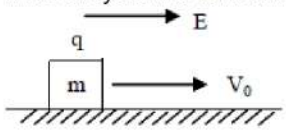
What is the magnitude of a point charge due to which the electric field 30 cm away has the magnitude 2 ?

A) $2 \times 10^{-11}C$ B) $3 \times 10^{-11}C$ C) $5 \times 10^{-11}C$ D) $9 \times 10^{-11}C$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 26

If a charge particle is projected on a rough horizontal surface with speed v_o . what is the value of dynamic coefficient of friction, if K.E of system is constant



A) $\frac{qE}{mg}$ B) $\frac{qE}{m}$ C) $\frac{q}{g}$ D) None of these

DIRECTIONS for the question: *Mark the best option:*

Question No. : 27

Identify the correct statement in the following, Coulomb's law correctly described the electric force that.

A) Binds the electrons of an atom to nucleus B) Binds the protons & neutrons in nucleus of an atom
C) Binds atoms together to form molecules D) Binds atoms & molecules to form solids

DIRECTIONS for the question: *Mark the best option:*

Question No. : 28

At large distance, electric field due to point charge is proportional to:-

A) $\frac{1}{r}$ B) $\frac{1}{r^2}$ C) $\frac{1}{r^3}$ D) Independent of r.

DIRECTIONS for the question: *Mark the best option:*

Question No. : 29

For uniformly charged infinite sheet, direction of electric field is always.

A) Parallel to the sheet B) Perpendicular to the sheet C) Can be parallel or perpendicular D) None of the above

DIRECTIONS for the question: *Mark the best option:*

Question No. : 30

What will happen when we rub a glass rod with silk cloth?

A) Same of the electrons from glass rod are transferred to silk cloth.
B) Glass rod gets positively charge and silk cloth gets negatively charged.
C) New charge is created in the process of rubbing. D) both (a) & (b) correct

DIRECTIONS for the question: *Mark the best option:*

Question No. : 31

When a person combs his hair static electricity is sometimes generated by what process?

A) contact between comb and hair results in charge. B) Friction between comb and hair result in transfer of electrons.
C) Deduction between comb and hair. D) Induction between comb and hair.

DIRECTIONS for the question: *Mark the best option:*

Question No. : 32

no. of electrons present in -1C of charge is

A) 6×10^{18} B) 1.6×10^{19} C) 6×10^{19} D) 1.6×10^{18}

DIRECTIONS for the question: *Mark the best option:*

Question No. : 33

The force between two small charged spheres having charges of 1×10^{-7} and 2×10^{-7} C placed 20 Cm a part in air is

A) 4.7×10^{-2}N B) 4.5×10^{-3}N C) 5.4×10^{-2}N D) 5.4×10^{-3}N

DIRECTIONS for the question: *Mark the best option:*

Question No. : 34

Two point charge of +3μC and +4μC repel each other with a force of 10 N. If each is given an additional charge -6μC, the new force.

A) 2N B) 4N C) 5N D) 7.5N

DIRECTIONS for the question: *Mark the best option:*

Question No. : 35

Which of the following statement is true about electrical forces?

A) Electrical forces are produced by electrical charges B) Like charges attract, unlike charges repel.
C) Electric forces are weaker than gravitational forces
D) Positive and negative charges combine to produce a third type of charge.

DIRECTIONS for the question: *Mark the best option:*

Question No. : 36

Two insulated charged metallic spheres P and Q have their centres separated by a distance of 60cm. The radii of P and Q are negligible compared to distance of separation. Mutual force of electrostatic repulsion if the charge on each is 3.2×10^{-7}C is?

A) 5.2×10^{-4}N B) 2.5×10^{-3}N C) 1.5×10^{-3}N D) 3.5×10^{-4}N

DIRECTIONS for the question: *Mark the best option:*

Question No. : 37

Electric field at a point is

A) Continuous if there is no charge at that point B) Discontinuous if there is a charge at that point C) Always continuous D) Both (a) and (b) are correct

DIRECTIONS for the question: *Mark the best option:*

Question No. : 38

If the charge on object is doubled then electric field becomes

A) Half B) Double C) Unchanged D) Thrice

DIRECTIONS for the question: *Mark the best option:*

Question No. : 39

A uniformly charged conduction sphere of 4.4m diameter has a surface charge density of $60\mu C\ m^{-2}$. The charge on the sphere is

A) 7.3×10^{-3}C B) 3.7×10^{-6}C C) 7.3×10^{-6}C D) 3.7×10^{-3}C

DIRECTIONS for the question: *Mark the best option:*

Question No. : 40

Electric potential is a

A) Scalar B) Vector C) Tensor D) Both b & c are correct

DIRECTIONS for the question: *Mark the best option:*

Question No. : 41

Potential due to point charge q at infinite distance is

A) zero B) $\frac{q}{4\pi\varepsilon_0 r}$ C) $\frac{q}{4\pi\varepsilon_0 r^2}$ D) Infinity

DIRECTIONS for the question: *Mark the best option:*

Question No. : 42

What is expression for potential due to electric dipole at a point P making an angle θ with the centre of dipole and at a distance r from it?

A) $\frac{\beta}{4\pi\varepsilon_0 r^2}$ B) $\frac{\beta\sin\theta}{4\pi\varepsilon_0 r^2}$ C) $\frac{\beta\cos\theta}{4\pi\varepsilon_0 r^2}$ D) $\frac{\beta\cos\theta}{4\pi\varepsilon_0 r^3}$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 43

What is the electrostatic potential inside a uniformly charged spherical shell, If charge q.

A) zero B) Constant C) $\frac{R}{4\pi\varepsilon_0 r}$ D) None of these

DIRECTIONS for the question: *Mark the best option:*

Question No. : 44

In the above question, how much work is required to separate two charges infinitely away from each other

A) 0.7J B) -0.7J C) 2.1J D) -2.1J

DIRECTIONS for the question: *Mark the best option:*

Question No. : 45

Find electric field between two metal plates 3mmm apart, connected to 18V battery

A) $6 \times 10^3 vm^{-1}$ B) $5 \times 10^3 vm^{-1}$ C) $3 \times 10^3 vm^{-1}$ D) $4 \times 10^3 vm^{-1}$

DIRECTIONS for the question: *Mark the best option:*

Question No. : 46

If potential energy between two charges is positive, the electrostatic force is

A) Attractive B) Repulsive C) Can be attractive or repulsing D) None of these

DIRECTIONS for the question: *Mark the best option:*

Question No. : 47

Current passes between two points when there is

A) Potential difference between two points B) No potential difference between two points C) Charge present
D) None of the above

DIRECTIONS for the question: *Mark the best option:*

Question No. : 48

If the charge on the capacitor is doubled, electric field inside it will become

A) half B) Four times C) Double D) No charge

DIRECTIONS for the question: *Mark the best option:*

Question No. : 49

If four capacitors of capacitance 10μF each are connected in series, which is the effective capacitance

A) 2.5μF B) 20μF C) 40μF D) 5μF

DIRECTIONS for the question: *Mark the best option:*

Question No. : 50

Which of the following is potential difference dimensional formula

A) $[M^1L^2T^{-3}A^{-1}]$ B) $[M^2L^3T^{-2}A^{-1}]$ C) $[M^1L^3T^{-2}A^{-1}]$ D) $[M^2L^2T^{-3}A^{-2}]$

QNo:- 1 ,Correct Answer:- *A*

Explanation:-

QNo:- 2 ,Correct Answer:- *D*

Explanation:-

QNo:- 3 ,Correct Answer:- *D*

Explanation:-

QNo:- 4 ,Correct Answer:- *B*

Explanation:-

QNo:- 5 ,Correct Answer:- *D*

Explanation:-

QNo:- 6 ,Correct Answer:- *B*

Explanation:-

QNo:- 7 ,Correct Answer:- *C*

Explanation:-

QNo:- 8 ,Correct Answer:- *C*

Explanation:-

QNo:- 9 ,Correct Answer:- *D*

Explanation:-

QNo:- 10 ,Correct Answer:- *C*

Explanation:-

QNo:- 11 ,Correct Answer:- *B*

Explanation:-

QNo:- 12 ,Correct Answer:- *A*

Explanation:-

QNo:- 13 ,Correct Answer:- *C*

Explanation:-

QNo:- 14 ,Correct Answer:- *B*

Explanation:-

QNo:- 15 ,Correct Answer:- *A*

Explanation:-

QNo:- 16 ,Correct Answer:- *A*

Explanation:-

QNo:- 17 ,Correct Answer:- *A*

Explanation:-

QNo:- 18 ,Correct Answer:- *B*

Explanation:-

QNo:- 19 ,Correct Answer:- *A*

Explanation:-

QNo:- 20 ,Correct Answer:- *A*

Explanation:-

QNo:- 21 ,Correct Answer:- *D*

Explanation:-

QNo:- 22 ,Correct Answer:- *C*

Explanation:-

QNo:- 23 ,Correct Answer:- *B*

Explanation:-

QNo:- 24 ,Correct Answer:- *B*

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QNo:- 25 ,Correct Answer:- *A*

Explanation:-

QNo:- 26 ,Correct Answer:- *A*

Explanation:-

QNo:- 27 ,Correct Answer:- *B*

Explanation:-

QNo:- 28 ,Correct Answer:- *B*

Explanation:-

QNo:- 29 ,Correct Answer:- *B*

Explanation:-

QNo:- 30 ,Correct Answer:- *D*

Explanation:-

QNo:- 31 ,Correct Answer:- *B*

Explanation:-

QNo:- 32 ,Correct Answer:- *A*

Explanation:-

QNo:- 33 ,Correct Answer:- *B*

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QNo:- 34 ,Correct Answer:- *D*

Explanation:-

QNo:- 35 ,Correct Answer:- *A*

Explanation:-

QNo:- 36 ,Correct Answer:- *B*

Explanation:-

QNo:- 37 ,Correct Answer:- *D*

Explanation:-

QNo:- 38 ,Correct Answer:- *B*

Explanation:-

QNo:- 39 ,Correct Answer:- *D*

Explanation:-

QNo:- 40 ,Correct Answer:- *A*

Explanation:-

QNo:- 41 ,Correct Answer:- *A*

Explanation:-

QNo:- 42 ,Correct Answer:- *C*

Explanation:-

QNo:- 43 ,Correct Answer:- *B*

Explanation:-

QNo:- 44 ,Correct Answer:- *A*

Explanation:-

QNo:- 45 ,Correct Answer:- *A*

Explanation:-

QNo:- 46 ,Correct Answer:- *B*

Explanation:-

QNo:- 47 ,Correct Answer:- *A*

Explanation:-

QNo:- 48 ,Correct Answer:- *C*

Explanation:-

QNo:- 49 ,Correct Answer:- *A*

Explanation:-

QNo:- 50 ,Correct Answer:- *A*

Explanation:-