No. of Printed Pages/Questions:3/12

O.P.JINDAL SCHOOL, SAVITRI NAGAR
PERIODIC TEST –I (Round-1) **(2026-27)**

CLASS-XII **MAX.MARKS-20**

SUBJECT-PHYSICS **MAX.TIME-1 Hour**

General Instruction:-

(i)All questions are compulsory .There are 12 questions in this question paper with internal choice.

(ii) SECTION –A: Question numbers 1 to 5 are MCQs , and question number 6 is assertion and reason carrying 1 mark each.

(iii) SECTION –B: Question numbers 7 to 10 are short answer questions carrying 2 marks each.

(iv) SECTION –C: Question numbers 11 and 12 are long questions carrying 3marks each.

(v)There will be internal choices in some of the question of section B and section C.

SECTION A

Q1. Four point charge of $+10^{-7}$C, -10^{-7}C, -10^{-7}C and 10^{-7}C are placed respectively at the corners A, B, C, D of a 0.05m square. Find the magnitude of the resultant force on the charge at D.

(a) 0.025 N (b)0.054N

(c) 0.045 (d)0.067N

Q2. Two charges -q each are placed at the vertices A and B of an equilateral triangle ABC. If M is the mid-point of A B, the net electric field at C will point along.

(a) MC (b) CB

(c)CA (d) CM

Q3. An electric dipole of length 2 cm is placed at an angle of 30° with an electric field 2×10^5 N /C. If the dipole experiences a torque of 8×10^{-3} Nm, the magnitude of either charge of the dipole is

(a)4mC (b)7mC

(c)8mC (d)2mC

Q4. The electric flux from a cube of edge L is Ø. Its value if edge of cube is made 2L and charge enclosed is halved is

(a) $\frac{\emptyset}{2}$ (b)2Ø

(c) 4Ø (d) Ø

Q5. For a uniformly charged ring of radius R, the electric field on its axis has the largest magnitude at a distance h from its centre. Then value of x is:

(a) R (b)$\frac{R}{\sqrt{2}}$

(c) $R\sqrt{2}$ (d)2R

Q6. Assertion (A) and Reason (R) type questions. Given below are the two statements labelled as Assertion (A) and Reason (R). Select the most appropriate answer from the options given below.

Assertion (A): A negative charge in an electric field moves along the direction of the electric field.
Reason (R): On a negative charge a force acts in the direction of the electric field.

(a) Both (A) and (R) are true and (R) is correct explanation of (A).
(b) Both (A) and (R) are true, and (R) is not correct explanation of (A).
(c) (A) is true. but (R) is false.
(d) (A) is false and (R) is also false

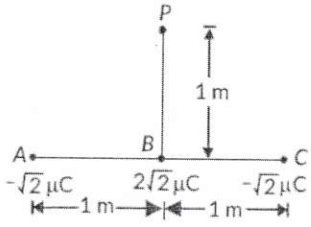
SECTION B

Q7. A charge +Q is placed on a thin conducting spherical shell of radius R .Use Gauss's theorem to derive an expression for the electric field at a point lying outside the spherical shell.

Q8. A particle of charge 2 μC and mass 1.6 g is moving with a velocity $4\,\hat{\imath}\ ms^{-1}$ .At t = 0 the particle enters in a region having an electric field E (in NC^{-1}) = $80\,\hat{\imath} + 60\,\hat{\jmath}$ .Find the velocity of the particle at t = 5s.

Q9. Two point charges -4e and-9e are placed at a distance 'r' apart from each other. Where should a third point charge q be placed on line joining the two charges so that it may be in equilibrium.

Q10. Three charges $-\sqrt{2}\mu C$, $2\sqrt{2}\mu C$ and $-\sqrt{2}\ \mu C$ are arranged along a straight line as shown in the figure. Calculate the total field intensity due to all three charges at the point *P*.



OR

(i)State Gauss's law in electrostatics.
(ii)The relative permittivity of a medium inside a conducting sphere is 7 and charge on it is 4μC.Find total flux passing through it.

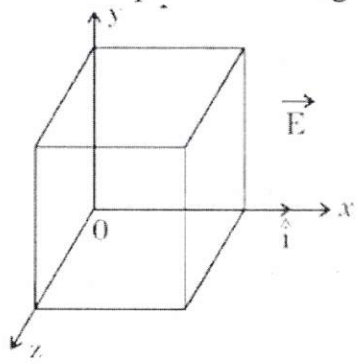
SECTION C

Q11. An infinitely long thin straight wire has a uniform linear charge density λ. Obtain the expression for the electric field (E) at a point lying at a distance x from the wire, using Gauss' law. Show graphically the variation of this electric field E as a function of distance x from the wire.

OR

An electric dipole of dipole moment p consists of point charges +q and -q separated by a distance 2a apart. Deduce the expression for the electric field E due to the dipole at a distance x from the centre of the dipole on its axial line in terms of the dipole moment p.

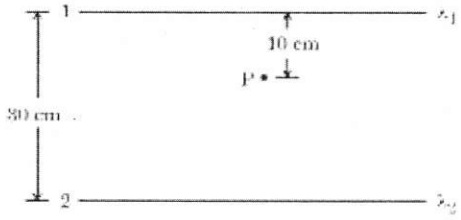
Q12. Electric field E in a region is given by $E = (5x^2+2)\,\hat{i}$ where E is in N/C and x is in meters. A cube of side 10 cm is placed in the region as shown in figure.



Calculate (i)the electric flux through the cube
(ii)the net charge enclosed by the cube.

OR

Two long straight wires 1 and 2 are kept as shown in the figure. The linear charge density of the two wires are $\lambda_1 = 10\mu C/m$ and $\lambda_2 = -20\mu C/m$. Find the net force F experienced by an electron held at point P.



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