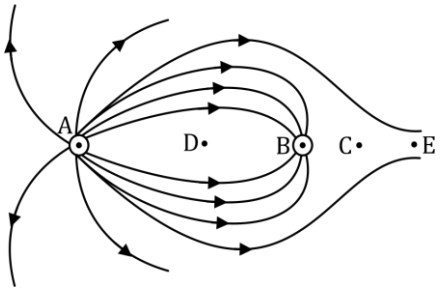
Nishant Jindal

DPP-3

Electric field Lines

Q.1 The field lines for two point charges are shown in Fig.



i. Is the field uniform?

ii. Determine the ratio q_A/q_B.

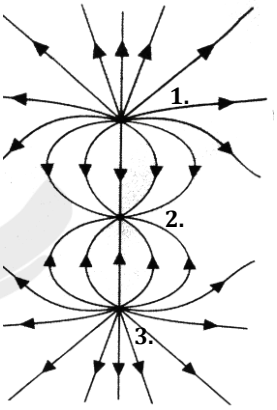
iii. What are the sign of q_A and q_B ?

iv. Apart from infinity, where is the neutral point?

v. Where will the lines meet which are coming from A and are not meeting at q_B ?

vi. Will a positive charge follow the line of force if free to move?

Q.2 Figure shows some of the electric field lines due to three point charges arranged along the vertical axis. All three charges have the same magnitude.



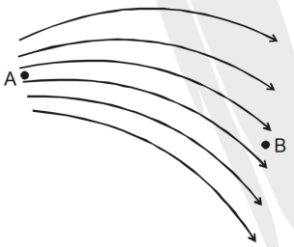
a. What are the signs of each of the three charges? Explain your reasoning.

Q.3 If electric field is uniform, then the electric lines of forces are:

(A) Divergent (B) Convergent

(C) Circular (D) Parallel

Q.4 The figure shows the electric lines of force emerging from a charged body. If the electric fields at A and B are E_A and E_B respectively and if the distance between A and B is r, then



(A) $E_A < E_B$

(B) $E_A > E_B$

(C) $E_A = \frac{E_B}{r}$

(D) $E_A = \frac{E_B}{r^2}$

Q.5 Select the correct statement :

(A) The electric lines of force are always closed curves

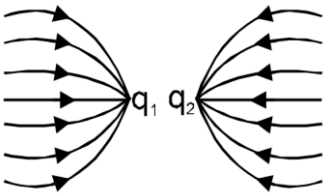
(B) Electric lines of force are parallel to equipotential surface

(C) Electric lines of force are perpendicular to equipotential surface

(D) Electric line of force is always the path of a positively charged particle.

Nishant Jindal

Q.6 The given figure gives electric lines of force due to two charges q_1 and q_2. What are the signs of the two charges?



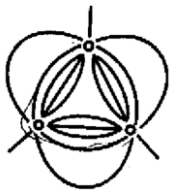
(A) Both are negative

(B) Both are positive

(C) q_1 is positive but q_2 is negative

(D) q_1 is negative but q_2 is positive

Q.7 Three positive charges of equal value q are placed at the vertices of an equilateral triangle. The resulting lines of force should be sketched as in : **[JEE 2001(Scr.), 3/105]**

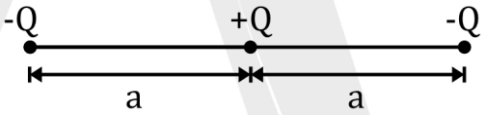
(A) 

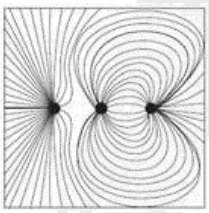
(B) 

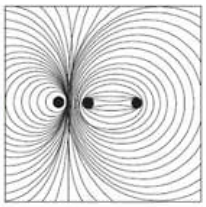
(C) 

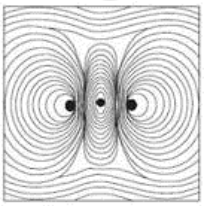
(D) 

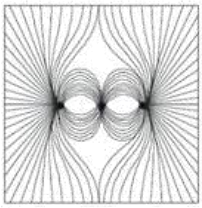
Q.8 The fig. shows the distribution of three charges – Q, +Q and – Q on the X-axis. Which of the following figures shows the possible electric field lines for the distribution?



(A) 

(B) 

(C) 

(D) 

Nishant Jindal

ANSWER KEY

1. **(i)** No

(ii) 2

(iii) q_A is positive and q_B is negative.

(iv) C is the neutral point.

(v) At infinity

(vi) No As. Line of force are curved, the direction of velocity and acceleration will be different.

2. **a.** 1, 3 → Postive and 2 is Negative

3. (D) **4.** (B) **5.** (C) **6.** (A) **7.** (B) **8.** (D)