



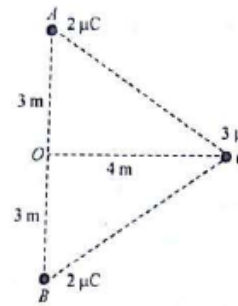
**MPVM GANGA GURUKULAM**  
**HOLIDAY HOME WORK SESSION – (2022-23)**  
**CLASS – XII PHYSICS**

1. If distance between two equal point charges is double and their individual charges are also doubled, what would happen to the force between them?
2. The electrostatic force between two charges is a central force. Why?
3. How is the coulomb force between two charge affected by the presence of third charge?
4. Force between two point charges kept at a distant  $d$  apart in air is  $F$ . If these charges are kept at the same distance in water, how does the the electric force between then change?
5. The dielectric constant of water is 80. What is its permittivity?
6. A glass rod when rubbed with silk cloth acquires a charge  $q = +3.2 \times 10^{-17} \text{ C}$ .
  - (i) Is silk cloth also charged?
  - (ii) What is the nature and magnitude of the charge on silk cloth?
7. There are two identical metallic spheres A and B. A is given a charge  $+Q$ . Both spheres are then brought in contact and then separated.
  - (i) Will there be any charge on B ?
  - (ii) What will the magnitude of charge on B, if it gets charged when in contact with A.
8. How many electrons exist in a  $-1\text{C}$  charge? What is the total mass of these electrons?
  - (a) Explain the meaning of the statements 'electric charge of a body is quantized'.
  - (b) Why can one ignore quantization of electric charge when dealing with macroscopic i.e., large scale charges?
9. When a glass rod is rubbed with a silk cloth, charges appear on both. A similar phenomenon is observed with many other pairs of bodies. Explain how this observation is consistent with the law of conservation of charge.
10.
  - (a) Explain the meaning of the statement 'electric charge of a body is quantised'.
  - (b) Why can one ignore quantisation of electric charge when dealing with macroscopic i.e., large scale charges?
11. A charged object has  $q = 4.8 \times 10^{-16} \text{ C}$ . How many units of fundamental charge are there on the object? (Take  $e = 1.6 \times 10^{-19} \text{ C}$ ).
12. Find the magnitude of the electrostatic force between two  $1\text{C}$  charges separated by a distance (a)  $1 \text{ cm}$ , (b)  $1\text{m}$ , and (c)  $1 \text{ km}$ , if such a configuration could be set up. Are these forces substantial forces? Do they indicate that the coulomb is a very large unit of charge?

13. Two insulated charged copper spheres A and B of identical size have charges  $q_A$  and  $q_B$  respectively. A third sphere C of the same size but uncharged is brought in contact with the first and then in contact with the second and finally removed from both. What are the new charges on A and B?

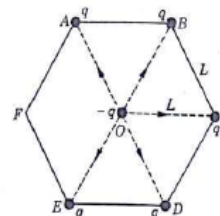
14. Charges of  $+5 \mu\text{C}$ ,  $10 \mu\text{C}$  and  $-10 \mu\text{C}$  are placed in air at the corner A, B and C of an equilateral triangle ABC, having each side equal to 5 cm. Determine the resultant force on the charge A.

15. Two equal positive charges each of  $2 \mu\text{C}$  interact with a third positive charge of  $3 \mu\text{C}$  situated as shown in fig. Find the magnitude force and direction of the experience by the charge  $3 \mu\text{C}$ .



16. Two point charges  $q_1 = +4 \mu\text{C}$  and  $q_2 = +6 \mu\text{C}$  are 10 cm apart. A point charge  $q_3 = +2 \mu\text{C}$  is placed midway between  $q_1$  and  $q_2$ . Find the magnitude and direction of the resultant force on  $q_3$ .

17. Five point charge each values  $q$  coulomb placed on five vertex of regular hexagon of side 'L' meter. Find magnitude of force on charge  $-q$  placed at the centre of hexagon.



18. Two identical charges,  $Q$  each are kept at a distance  $r$  from each other. A third charge  $q$  is placed on the line joining the above two charges such that all the three charges are in equilibrium. What is the magnitude, sign and position of the charge  $q$ ?

19. A charge  $Q$  is to be divided on two object. What should be the values of the charges on the two objects so that the force between the object can be maximum?

**20. Art integration project in Physics**

**TOPIC:-**

To study of A.C. Generator in context of produce electrical energy from mechanical energy used in Meghalaya and Arunachal Pradesh.