



## King Saud University – Muzahimiyah Branch

### Faculty of Information Technology and Computer Sciences

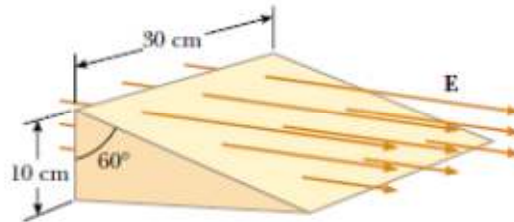
#### Home Work (3) Gauss's Law

**Due Date : Wednesday 3/12/2014**

**Hand solution to Teaching Assistant: Eng. Mohammed Ashraf**

Question 1:

Consider a closed triangular box resting within a horizontal electric field of magnitude  $E = 7.80 \times 10^4 \text{ N/C}$  as shown in Figure below. Calculate the electric flux through (a) the vertical rectangular surface, (b) the slanted surface, and (c) the entire surface of the box.

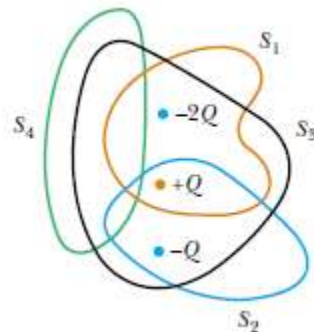


Question 2:

The following charges are located inside a submarine:  $5.00 \text{ } \mu\text{C}$ ,  $-9.00 \text{ } \mu\text{C}$ ,  $27.0 \text{ } \mu\text{C}$ , and  $-84.0 \text{ } \mu\text{C}$ . (a) Calculate the net electric flux through the hull of the submarine. (b) Is the number of electric field lines leaving the submarine greater than, equal to, or less than the number entering it?

Question 3:

Four closed surfaces,  $S_1$  through  $S_4$ , together with the charges  $-2Q$ ,  $Q$ , and  $-Q$  are sketched in Figure below. Find the electric flux through each surface.



Question 4:

A charge of  $170 \text{ } \mu\text{C}$  is at the center of a cube of edge  $80.0 \text{ cm}$ . (a) Find the total flux through each face of the cube. (b) Find the flux through the whole surface of the cube. (c) What If? Would your answers to parts (a) or (b) change if the charge were not at the center? Explain.