Course No: *Eng1307*
Course Title: *Physics II*
Date: *22 /1/2014*
No. of Questions: *(6)*
Time: *2:00 hours*
Using Calculator: *(Yes)*

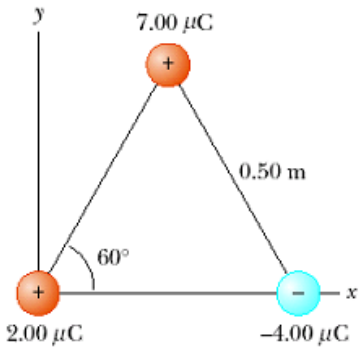
University of Palestine

final Exam
2014/2015
Total Grade:60

Instructor Name: *Dr. Loai Afana*
Student No.: _____
Student Name: _____
College Name: _____
Dep. / Specialist: _____
Using Dictionary: *(No)*

Question 1: (10/60)

Three point charges are located at the corners of an equilateral triangle as shown in Fig. Calculate the resultant electric force on the point of 7.0 µC.



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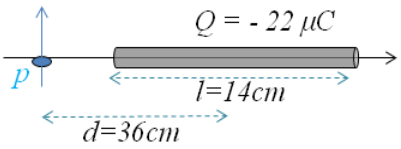
Question 2: (10/60)

A) A rod of length *(l)* has a uniform positive charge per unit length *(λ)* and a total charge *(Q)*. Calculate the electric field *(E)* and show direction at a point *(P)* that is located along the long axis of the rod and a distance *(a)* from one end.

B) Find *(E)* and show direction if: $l = 14cm$, $Q = -22\mu C$, $d = 36cm$,

C) Find E if $l << a$



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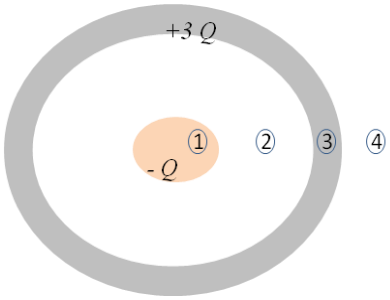
Question 3: **(10/60)**

A solid conducting sphere of radius (a), has a net charge $-Q$.
A conducting spherical shell of inner radius (b) and outer radius (c) is concentric with the solid sphere and has a net charge $+3Q$ as shown in figure.

1- Find the charge distribution on the sphere and the shell.
2- Using Gauss's law find the electric field and direction in the regions labeled 1, 2, 3, 4 where: (1) < a , a < (2) < b , b < (3) < c , (4) > c .



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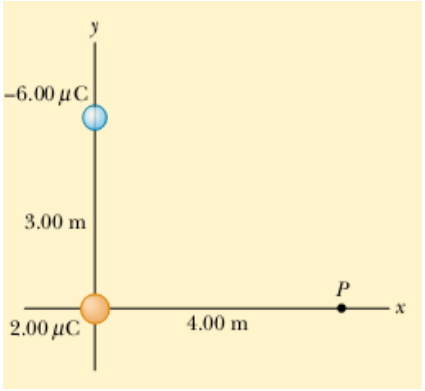
Question 4: (10/60)

A charge $q_1 = 2.00\ \mu C$ is located at the origin, and a charge $q_2 = -6.00\ \mu C$ is located at (0,3) m,
(A) Find the total electric potential due to these charges at the point P, whose coordinates are (4,0)m.
(B) You bring a third charge q_3=3.00 μC from infinity to point P (4,0)m, How much work must you do?
(C) Find the total potential energy of the system of all 3 charges.



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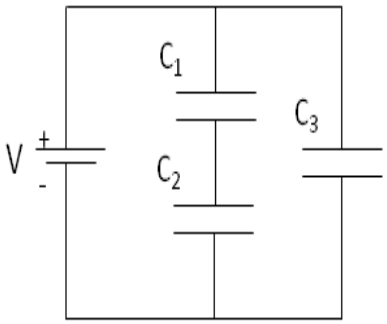
Question 5: **(10/60)**

In the following circuit: $C_1 = 10\ \mu F$, $C_2 = 5.0\ \mu F$, $C_3 = 4.0\ \mu F$.
1-Find the equivalent capacitance of the whole combination.
2- If V = 100 volts, find charge and Voltage for C_1 ,C_2 ,C_3 .
3-What is the total energy stored in the circuit?



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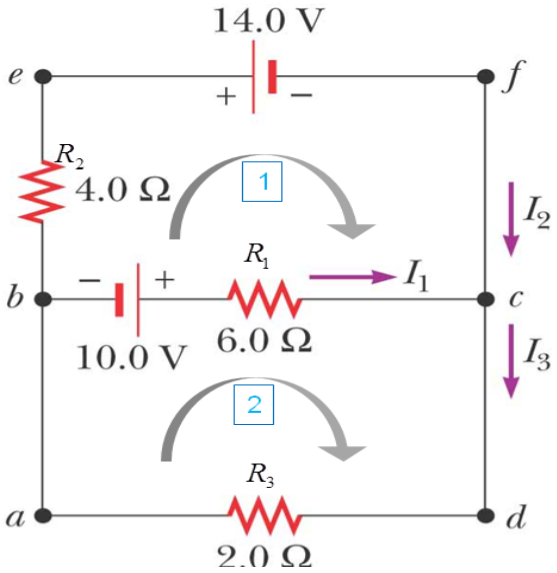
Question 6: **(10/60)**

In the following electrical circuit:

1-Find all three currents, 2-Find the voltage for resistance R3. 3- What power is delivered to resistor R1



End of Questions

Note: $k = 9*10^{9}$, $\varepsilon_o = 9*10^{-12}$