University of Jordan
Faculty of Science
Department of Physics

Second Semester 2014/2015
Date: 18/3/2015
Time: 3:30-4:30

General Physics II (0302102)
First Exam

Name: Omar Abedrabbo عمر عبد الرحمن يوسف

0144364   18/20

Number: 50

Instructor: د. زياد ابو ياسع

Constants: $\varepsilon_0 = 8.85 \times 10^{-12}$ $C^2/N.m^2$, $e = 1.602 \times 10^{-19} C$, $m_e = 9.11 \times 10^{-31}$ kg,
$k_e = 9 \times 10^9$ $N.m^2/C^2$

Answer Sheet

List your final answer in this table. Only the answer in this table will be graded.

Question	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Answer	a	c	d	b	d	a	c	b	e	c

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1. Three point charges, two positive and one negative, each having a magnitude of 20 μC are placed at the vertices of an equilateral triangle (30 cm on a side). What is the magnitude of the electrostatic force on the negative charge?

   (a) 69 N   (b) 39 N   (c) 25 N   (d) 58 N   (e) 85 N

2. Charge of uniform density 4.0 nC/m is distributed along the x axis from $x = -2.0$ m to $x = +3.0$ m. What is the magnitude of the electric field at the point $x = +5.0$ m on the x axis?

   (a) 49 N/C   (b) 66 N/C   (c) 13 N/C   (d) 16 N/C   (e) 19 N/C

3. A conducting sphere of radius 10 cm is charged with a total positive charge 100 nC. What is the potential difference between two points, one located 3.0 cm away from the center and the other at the surface?

   (a) 28 V   (b) 66 V   (c) 57 V   (d) 0 V   (e) 85 V

power unit

4. Over a certain region of space, the electric potential is $V = 2xy - x^2z + z^3y^2$.

What is the magnitude of the electric field at the point P that has coordinates of (1.0, 2.0, -1.0) m?

(a) 49 N/C   (b) 13 N/C   (c) 19 N/C   (d) 66 N/C   (e) 22 N/C

5. A charge of uniform volume density (40 nC/m^3) fills a cube with 8.0 cm edges. What is the total electric flux (in units of N.m^2/C) through the surface of this cube?

(a) 4.6   (b) 1.1   (c) 5.7   (d) 2.3   (e) 3.5

6. A long straight metal rod has a radius of 2.0 mm and a surface charge of density 0.40 nC/m^2. Determine the magnitude of the electric field 3.0 mm from the axis.
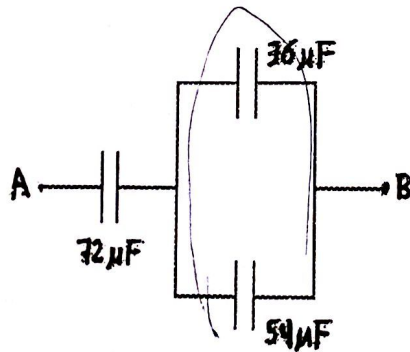
(a) 45 N/C   (b) 30 N/C   (c) 15 N/C   (d) 75 N/C   (e) 60 N/C $E = \dfrac{\sigma R}{\varepsilon_0 r}$

7. The electric field (in N/C) of a point charge $q = 8.0$ nC at a point located 2.0 m from the charge is:

(a) 27   (b) 72   (c) 18   (d) 36   (e) 68 .

8. If $V_A - V_B = 50$ V, how much energy is stored in the 54 μF capacitor?

(a) 1.6 mJ   (b) 13 mJ   (c) 8.9 mJ   (d) 19 mJ   (e) 23 mJ

9. Which of the following is not a capacitance? (K is the dielectric constant)

(a) $\dfrac{\varepsilon_0 A}{d}$ (b) $\dfrac{K\varepsilon_0 A}{d}$ (c) $\dfrac{ab}{k_e(b-a)}$ (d) $\dfrac{\ell}{2k_e \ln(b/a)}$ (e) $\dfrac{k_e\varepsilon_0 A}{d}$

10. How much charge is on each plate of a 4.00 μF capacitor when it is connected to a 12.0 V battery?

(a) 20μC   (b) 77μC   (c) 48μC   (d) 68μC   (e) 32μC

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