College of Sciences
Department of
Physics and Astronomy

كلية العلوم
قسم الفيزياء والفلك

جامعة الملك سعود
King Saud University

First Midterm Exam

Monday, 6/2/1440	PHYS 111	Academic year 1439-40H
10:00 – 11 :30 a.m.	General Physics 2	First Semester

Student's Name		اسم الطالبة
ID number		الرقم الجامعي
Section No.		رقم الشعبة
Classroom No.		رقم قاعة الاختبار
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Roll Number		رقم التحضير

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Write your selected answer for each question in CAPITAL LETTERS here:

اكتب الحرف الدال على إجابتك في الجدول التالي:

Q1	Q2	Q3	Q4	Q5
Q6	Q7	Q8	Q9	Q10
Q11	Q12	Q13	Q14	Q15
Q16	Q17	Q18	Q19	Q20

Constants

$k = 9\times10^{9}\ \text{N.m}^2/\text{C}^2$, $\varepsilon_o = 8.85 \times 10^{-12}\ \text{C}^2/\ \text{N. m}^2$, $|e| = 1.6 \times 10^{-19}\ \text{C}$

Q1. Two charges q_1 and q_2 sperated by distance r . According to Coulomb's law the force between them is F, if the charge q_1 replaced by $2q_1$, the new force will be:

A. ½ F
B. 2 F
C. 3 F
D. 4 F

Q2. The diagram shows two identical particles, each with positive charge Q. The electric field at point P is:

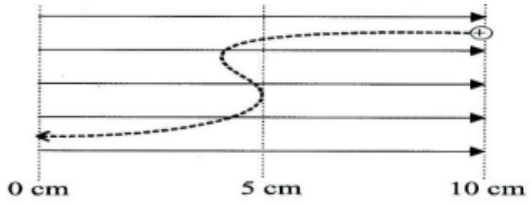
A. ↑
B. ↓
C. →
D. ←

Q3. When an electric field moves a negative charge toward the electric field, the electric potential energy of the negative charge ----------

A. Increase
B. Decrease
C. Does not change
D. Will be zero

Q4. An 8 C positively charged particle affected by an electric field of 10 N/C. The work required to move the positive charged particle along the 10 cm path shown below is:

A. 80 J
B. 10 J
C. 8 J
D. 0.8 J

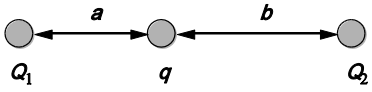


Q5. The elelctric potential at point A located at distance 0.3 m from 10μC positive charge , and at 0.5 m from 20 μC is:

A. 300×10^3 V
B. 360×10^3 V
C. 660×10^3 V
D. 60×10^3 V

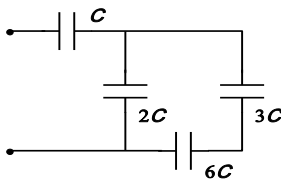
Q6. If a = 3.0 mm, b = 4.0 mm, Q_1 = 60 nC, Q_2 = –80 nC, and q = 36 nC as shown in the figure. The magnitude of the total electric force on q is:

A. 5.0 N
B. 4.4 N
C. 3.8 N
D. 5.7 N



Q7. Determine the equivalent capacitance of the combination shown when $C = 45\ \mu F$.

A. 28 μF
B. 36 μF
C. 52 μF
D. 44 μF



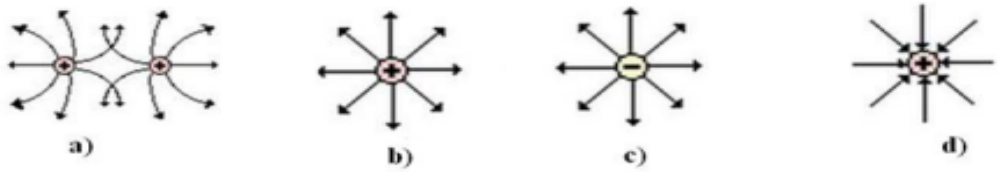
Q8. When a capacitor has a charge of magnitude 80 µC on each plate the potential difference across the plates is 16 V. When the potential difference across its plates is 42 V, the amount of energy that would be stored in this capacitor is:

A. 5.2 mJ
B. 4.4 mJ
C. 3.2 mJ
D. 1.4 mJ

Q9. An air filled parallel plate capacitor has a plate area of 1.9 cm^2 and plates separation of 3.00 mm. If it is fully charged by an 8.00 V battery, the charge on the plates is:

A. 3.03 pC
B. 2.00 pC
C. 6.90 pC
D. 4.5 pC

Q10. The electric field lines are correctly described by figure: b



Q11. A metal sphere with a radius of 2 cm charged to 80.3×10^{-19} C, the number of charge on the sphere is:

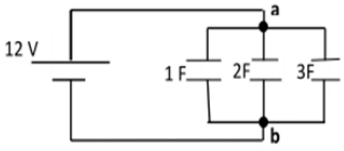
A. 25
B. 31
C. 44
D. 50

Q12. A parallel plate capacitor separated by air has a capacitance of 5 µF. What will be the new capacitance if the parallel plate separated by a dielectric with a dielectric constant ε_r=8 (k=8).

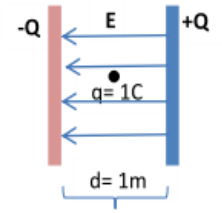
A. 44 µF
B. 40 µF
C. 80 µF
D. 50 µF

Q13. Three capacitors are connected in parallel as shown. The energy that could be stored in this combination of capacitors is:

A. 36 J
B. 72 J
C. 432 J
D. 7.2×10^3 J



Q14. Two different charged metal plates are placed one meter apart creating a constant electric field between them. One Coulomb charged particle is placed in the space between them.
The particle experiences a force of 100 Newtons due to the electric field. The potential difference across the plates is:



A. 1 V
B. 10 V
C. 100 V
D. 1000 V

Q15. The amount of energy stored in a capacitor is equal to:
A. The total amount of charge on the capacitor.
B. The work done to charge the capacitor.
C. The potential difference inside the capacitor.
D. The electric force inside the capacitor.

Q16. Four different electric circuits connected differently. These circuits have identical capacitors C and batteries, V. The circuit that could store the highest amount of charge is: C

Q17. One farad is equivalent to:
A. 1 joule/second
B. 1 coulomb/ volt
C. 1 newton/meter
D. 1 amber /second

Q18. Electron volt eV is a small unit for:
A. Electric potential (voltage)
B. Electric field
C. Electric force
D. Electric energy

Q19. When a positive charge moves opposite to the direction of the electric field,
A. the electric field does positive work on the charge.
B. the electric field does negative work on the charge.
C. the electric field does not do work.
D. the potential energy of the charge does not change.

Q20. The capacitance of the a capacitor does not depend on:
A. the material of the capacitor.
B. the plates area of the capacitor.
C. the seperation of the capacitor.
D. the applied voltage.