

College of Sciences

كلية العلوم

Department of Physics &
Astronomy

قسم الفيزياء والفلك



Second Midterm Exam

Thursday Dhul-Qadah, 20, 1439	PHYS 109	Academic year 1438-39H
7:00 PM. – 8:30 PM	General Physics	Summer Semester

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

15

Choose the correct answer **CAPITAL LETTERS**

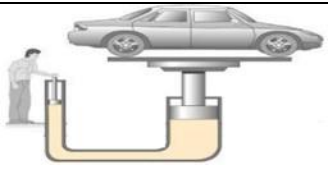
Constant:

$$k = 9 \times 10^9 \text{ N.m}^2/\text{C}^2, \epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2/\text{N. m}^2, |e| = 1.6 \times 10^{-19} \text{ C}$$

$$m_p = 1.67 \times 10^{-27} \text{ kg}, m_e = 9.11 \times 10^{-31} \text{ kg}, g = 9.8 \text{ m/s}^2$$

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Q1	A 70 kg man climbs upstairs in a building reaches the fourth floor (10 m above the ground floor) in 15 seconds. The work done by the man is:				A
	A)6.9 kJ	B)10.3 kJ	C)13.7kJ	D)10.0 J	E)9.13 kJ
Q2	In the above question the power of the man is:				C
	A)104 W	B)686 W	C)457 W	D)915 W	E)206W
Q3	A lady sled down a frictionless hill from rest, if her speed at the bottom of the hill is 10.0 m/s. the height of the hill (in m) is:				C
	A)1.8	B)20.4	C)5.1	D)8.1	E)3.5
Q4	An object of mass 5 kg has a speed of 3.5 m/s at position 1 and a kinetic energy of 40.5 J at position 2 the total work done on the object as it moves from position 1 to position 2 is:				D
	A)4.8 J	B)8.4 J	C)3.9 J	D)9.9 J	E)9.5 J
Q5	An ideal gas is initially at a temperature of 400 K. Its volume doubled while its pressure decreases by a factor of two. What is its final temperature				E
	A)300K	200 K	C) 25 K	D) 300 K	E) 400 K
Q6	Boyle's law states that: A) when the pressure of the gas is kept constant, its volume is directly proportional to its temperature. B) when the gas is kept at a constant temperature, its pressure is inversely proportional to its volume. C) when the pressure of the gas is kept constant, its volume is inversely proportional to its temperature. D) when the gas is kept at a constant temperature, its pressure is directly proportional to its volume. E) None of the above.				B
Q7	The law used to quantify the pressure at the bottom of a swimming pool is: A) Archimedes principle B) Pascal's law C) Newton 's first law D) Laplace's law E) any one of the above				B

Q8	A hydraulic lift is shown in adjacent Figure. The diameter of the larger piston is 0.60 m, and the diameter of the small piston is 0.03 m. The force required to be applied in small piston to lift a car of mass 1200 kg (in N) is:				B
	A)117.6	B) 29.4	C)49		
Q9	A large container is open to air. The water leaks at small hole 20 m below the surface. The speed of the water in (m/s) at the small hole is:				B
	A)9.8	B)19.8	C)17.7	D)24.2	
Q10	The gauge pressure at depth of 10 m below the surface of a lake in (Pa) is : (take the density of water 10^3kg/m^3 and acceleration due to gravity 10 m/s^2)				E
	A) 2.0×10^5	(B) 1.50×10^5	(C) 760	(D) zero	
Q11	Two charges repel each other with a force of magnitude F. The charges are both doubled and the distance is reduced to the half. What is the magnitude of the new repulsion force?			B	
	A) $4F/9$	B) $16F$	C) $3F/2$	D) F	E) $4F/9$
Q12	Two negative charges $5\ \mu\text{C}$ and $10\ \mu\text{C}$ are separated by 10 cm. The magnitude of the electric field at the center, in N/C is:				A
	A) 1.8×10^7	B) 1.8×10^9	C) zero	D) 7.2×10^7	
Q13	In a parallel plate capacitor, the separation between the plates is 1.0 mm, the area of each plate is 5 cm^2 it stores a charge of 0.4 nC. The voltage across the capacitor in (V) is:			B	
	A) 904	B)90.3	C)0.451	D) 2.7×10^{-3}	E) zero
Q14	The electrical potential energy of point charge q in the electric field of a charge Q is given by: $E_{el} = \frac{qQ}{4\pi\epsilon_0 r}$			B	
	E_{el} is zero when the distance r is:				
	A) zero	B) infinity	C) tripled	D) quadruple	E) halved

Q15	An electron is released into a uniform electric field of magnitude 2.5×10^3 N/C. The acceleration of the electron in m/s^2 (neglecting gravity) is:				C
A) 9.0×10^{16}		B) 8.8×10^{14}	C) 4.4×10^{14}	D) 7.9×10^{14}	E) 8.8×10^{15}