College of Sciences **كلية العلوم**

Physics Department of and Astronomy قسم الفيزياء والفلك

Thursday , Shawal 28, 1439	**PHYS 109**	**Academic year 1438-39 H**
7:00 – 8:30 pm	**General Physics**	**Summer Semester**

Student's Name		**اسم الطالب**
ID number		**الرقم الجامعي**
Section No.		**رقم الشعبة**
Classroom No.		**رقم القاعة**
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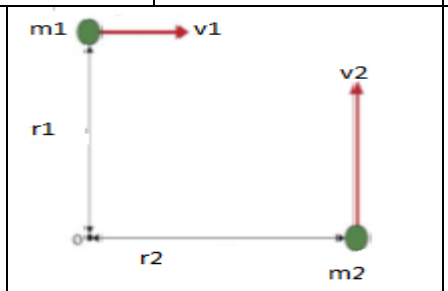
Take g = 9.8 m/s^2, G = 6.67×10^{-11} $N.m^2/kg^2$

1	A car initially moving with velocity 20 m/s, brakes with deceleration 2 m/s^2. How far will it take to stop?					D
	A) 37.5	B) 25.0 m	C) 50.0 m	D) 100.0 m	E) 200.0 m	
2	A 100 N box is pushed along a horizontal floor under the action of a horizontal force of 40 N magnitude. The coefficient of kinetic friction is 0.2. The resulting acceleration is					B
	A)6.73m^2/s	B)1.96 m^2/s	C) 2.59 m^2/s	D) 9.8 m^2/s	E) zero	
3	Which of the following is NOT a fundamental force? A) Electromagnetic force B) Frictional force C) Weak nuclear force D) Strong nuclear force E) None of the above					B
4	An ice skater standing on ice is throwing a water bottle in a horizontal direction. Taking the skater and the bottle as a system, is the total momentum of the system conserved? and why? (Ignore friction) A) yes, because the total momentum of any system is always conserved B) yes, because the net external force is equal to zero. C) no, because the momentum is never conserved. D) yes, because the net external force is equal to zero E) None of the above.					B
5	A child at an amusement park takes a ride on a horizontal wheel that has a radius of 9.0 m and spins 4 times per minute. What is the child's centripetal acceleration?					B
	A) 0.986 m/s^2	B)1.58 m/s^2	C) 0.219 m/s^2	D) 3.298 m/s^2	e) zero m/s^2	
6	A 60 kg man hangs from a cable suspended to a helicopter. Find the tension (in N) in the cable if the acceleration is 5 m^2/s downward. The mass of the cable is neglected.					C
	A)828.0 N	B) 888.0 N	C) 288.0 N	D) 348.0 N	E) 492.0 N	
7	A 6.0 kg box is resting on an inclined plane 30º above the horizontal if the coefficient of static friction is 0.30. What is the minimum force required to move the box?					A
	A)15.3 N	B)14.11 N	C)7.06 N	D)12.2 N	E)1.25 N	
8	A student walks from home to college and back again. Which of the following is the most correct?					A

	A) The student has zero displacement and **positive** average speed. B) The student has **Positiv**e distance travelled and positive average velocity. C) The student has zero displacement and positive average speed. D) The student has zero average velocity and zero distance travelled. E All of the above.	
9	An object of mass m = 3.0 kg makes a perfectly inelastic collision with a second object that is initially at rest. The combined object moves after the collision with a speed equal to one-third of the object that was initially moving. What is the mass of the object that was initially at rest? A) 3.0 kg | B) 6.0 kg | C) 9.0 kg | D 10.0 kg | E) 12 kg	B
10	If the radius of Mars is 3.43×10^6 m and mass is 6.40×10^{23}kg. Acceleration of the gravity at the surface of the Mars is A) 1.63 m/s^2 | B) 3.62 m/s^2 | C) 2.0 m/s^2 | D) 2.5 m/s^2 | E) 3.35 m/s^2	B
11	Two objects of masses m_1 =7.6 kg and m_2 = 4.5 kg, with speeds of v_1 = 3.6 m/s and v_2 = 5.2 m/s, are moving in a perpendicular direction around the origin **O**, as shown in adjacent figure. If at one moment their distance from the origin **O** is r_1 =2.5 m and r_2 =3.8 m, what is their total (net) angular momentum about point **O?**  A) 109.676 kg m^2 /s | B)0.4 kg m^2 /s | C)20.5 kg m^2 /s | D) -37.24 kg m^2 /s | E) 3.30 kg m^2 /s	C
12	A system is said to be in equilibrium if **A.** is subjected to two opposite forces **B.** the net force is null **C.** is subjected to three perpendicular forces **D.** A and B are true **E.** None of the above	B

13	Two children having masses m_A = 60 kg and m_B = 40 kg are balanced on a bar with a pivot at its center (See the Figure). Child A sits at 0.5 m from the pivot. In order for child A to balance child B, the distance of child B (in m) from the pivot is:					C
	A) 0.33	B) 0.67	C) 0.75	D 0.10	E) 0.40	
14	What is the necessary condition for conservation of angular momentum? A. Net torque exerted on the body is zero. B. Net torque exerted on the body is constant. C. Angular acceleration of the rotating body is constant. D. No forces are acting on the body. E. none of the above					A
15	The gravitational force (in N) between two identical spheres, each has a mass of m = 15 kg and a radius of r = 0.5 m. when in contact to each other is:					A
	A)1.5 x10^{-8}	B)1.25 x10^{-10}	C)1.67 x10^{-9}	D3.0x10^{-9}	D)1.5 x10^{-9}	