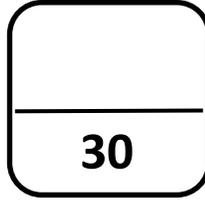


College of Sciences
Department of Physics & Astronomy



كلية العلوم
قسم الفيزياء والفلك

Midterm Exam Academic Year 1444 H – 3 rd Semester			
Exam Information معلومات الامتحان			
Course name:	General Physics	فيزياء عامة	اسم المقرر:
Course code:	PHYS 103	103 فيز	رمز المقرر:
Exam date:	Tuesday 02/05/2023G	الثلاثاء ١٠/١٢/١٤٤٤ هـ	تاريخ الامتحان:
Exam time:	07:00 PM	٠٧:٠٠ مساءً	وقت الامتحان:
Exam duration:	Two Hours	ساعتان	مدة الامتحان:

Student Information معلومات الطالب		
Student's name:		اسم الطالب:
Student ID no.:		الرقم الجامعي:
Section no.:		رقم الشعبة:
Classroom no.:		رقم قاعة الامتحان:
Teacher's name:		اسم أستاذ المقرر:

تعليمات الاختبار:

- إظهار بطاقة الطالب الجامعية.
- الجولات والساعات الذكية يجب أن تكون خارج قاعة الاختبار.
- كتابة الإجابة لكل سؤال بالأحرف الكبيرة (CAPITAL LETTERS) في الجدول أدناه باستخدام قلم الحبر.
- تسلم جميع صفحات الاختبار لأستاذ المادة / المراقب.

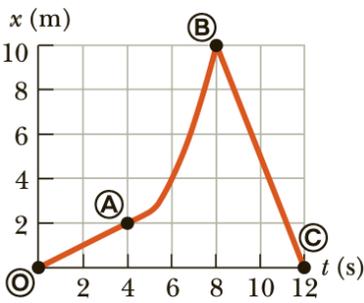
Write you final answer for each question (in CAPITAL LETTERS) in the following table:

Q. 1	Q. 2	Q. 3	Q. 4	Q. 5
B	B	A	C	D
Q. 6	Q. 7	Q. 8	Q. 9	Q. 10
C	A	B	A	B
Q. 11	Q. 12	Q. 13	Q. 14	Q. 15
D	B	A	B	D
Q. 16	Q. 17	Q. 18	Q. 19	Q. 20
D	A	C	A	B

Name: _____

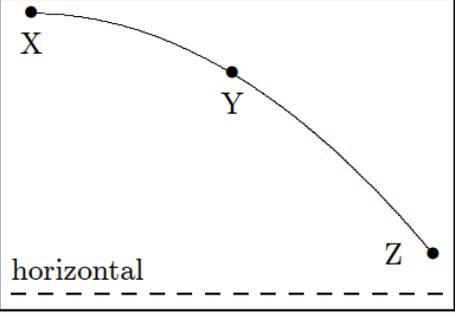
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Take $g = 9.8 \text{ ms}^{-2}$ wherever needed

Q	Multiple choice questions
1	<p>If the velocity v is related to acceleration a and distance x by the following expression: $v^2 = 2ax^p$. The power p that makes this equation dimensionally consistent is:</p> <p>A) 0 B) 1 C) -1 D) 2</p>
2	<p>A car starting from rest and accelerating at a maximum acceleration of a for a time t. What is the maximum distance that you can travel in time t?</p> <p>A) $2 a t^2$ B) $\frac{1}{2} a t^2$ C) $a t$ D) $2 a t$</p>
3	<p>A train moves slowly along a straight portion of track according to the graph of position vs. time in the Figure. The average velocity of the train during the time interval from 4.0 s to 8.0 s of motion is:</p>  <p>A) 2.0 m/s B) -2.5 m/s C) 2.5 m/s D) -2.0 m/s</p>
4	<p>A particle moves along the x axis. Its position varies with time according to the expression $x = (3.0 - 2.0 t)^2$, where x is in meters and t is in seconds. Its instantaneous velocity at $t = 2.0 \text{ s}$ is:</p> <p>A) 2.0 m/s B) -2.0 m/s C) +4.0 m/s D) -4.0 m/s</p>
5	<p>A car starting from rest accelerates at a constant rate, and it has traveled 42.0 m in 4.00 s. The acceleration of the car is:</p> <p>A) 1.20 m/s^2 B) 2.40 m/s^2 C) 3.50 m/s^2 D) 5.25 m/s^2</p>
6	<p>The engineer of a train traveling at 22 m/s applies a brake when he passes an amber signal (إشارة ضوئية). The next signal is one km down the track and the train reaches it 75 s later. Assuming a uniform acceleration, the speed of the train at the second signal will be :</p> <p>A) 2.1 m/s B) 9.8 m/s C) 4.8 m/s D) 6.8 m/s</p>
7	<p>A rocket rises vertically, from rest, with an acceleration of 3.2 m/s^2 until it runs out of fuel at an altitude of 1200 m. After this point, its acceleration is that of gravity (downward). What maximum altitude does the rocket reach ?</p> <p>A) 1592 m B) 1478 m C) 1688 m D) 1796 m</p>

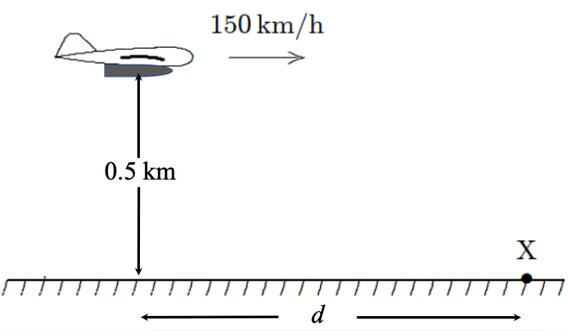
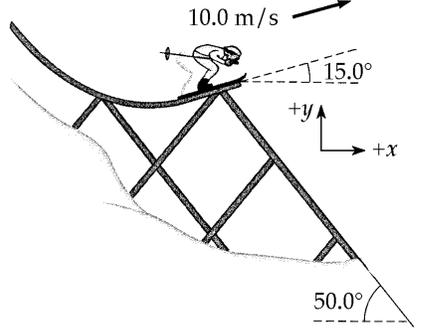
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8	<p>A ball is thrown straight up. When the ball reached its maximum height, which of the following statements is false for the ball:</p> <p>A) its acceleration is not zero B) its acceleration is zero C) its final speed is zero D) its initial speed is not zero</p>
9	<p>A stone is dropped from rest from the top of a tall building. After 3 s of free fall, its displacement from top of the building is:</p> <p>A) -44.1 m B) $+54.2$ m C) -23.3 m D) $+38.2$ m</p>
10	<p>A man moves inside a forest by following these four consecutive displacements: <i>130 m North, 350 m northeast, 495 m west and 350 m southeast</i>. His resultant displacement is:</p> <p>A) 150 m B) 130 m C) 180 m D) 160 m</p>
11	<p>For which of the following vectors is the magnitude of the vector equal to one of the components of the vector?</p> <p>A) $2\mathbf{i} + 5\mathbf{j}$ B) $-2\mathbf{j}$ C) $2\mathbf{i} - 3\mathbf{j}$ D) $4\mathbf{i}$</p>
12	<p>The magnitude, r, and direction, θ, for the vector $\vec{A} = -3.5\mathbf{i} - 2.5\mathbf{j}$ are receptively:</p> <p>A) 6.2 & 120° B) 4.3 & 216° C) 6.2 & 160° D) 4.3 & 48°</p>
13	<p>A particle starts from the origin at $t = 0$, and moves in the xy plane with constant acceleration has a velocity of: $\mathbf{v}_i = (4.0\mathbf{i} - 3.0\mathbf{j})$ m/s. At $t = 3.0$ s, the particle's velocity is $\mathbf{v}_f = (13.0\mathbf{i} - 6.0\mathbf{j})$ m/s. Find the magnitude of the acceleration of the particle.</p> <p>A) 3.2 m/s² B) 4.3 m/s² C) 2.8 m/s² D) 5.1 m/s²</p>
14	<p>A stone is thrown horizontally and follows the path XYZ shown. The direction of the acceleration of the stone at point Y is:</p> <div style="display: flex; align-items: center;">  </div> <p>A) \rightarrow B) \downarrow C) \searrow D) \nearrow</p>

Name: _____

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<p>15</p>	<p>The airplane, shown in the Figure, is in level flight at an altitude of 0.50 km and a speed of 150 km/h. At what distance d should it release a heavy bomb to hit the target X?</p>	
<p>16</p>	<p>A skier leaves the ramp of a ski jump with a velocity of 10 m/s, 15° above the horizontal, as in Figure. The slope is inclined at 50°, and air resistance is negligible. The distance from the ramp to where the jumper lands is:</p>	
<p>17</p>	<p>A particle moves in the xy plane, starting from the origin at $t = 0$ with an initial velocity having an x component of 18 m/s and a y component of -12 m/s. The particle experiences an acceleration in the x direction, given by $a_x = 3.0 \text{ m/s}^2$. Calculate the speed of the particle at $t = 5.0 \text{ s}$</p>	
<p>18</p>	<p>A car is moving in a horizontally circular path of radius equal to 25 m. If the car has a tangential acceleration of 2 m/s², and its velocity at this moment is 10 m/s then its total acceleration is:</p>	
<p>19</p>	<p>An object moving at a constant speed requires 6 s to go once around a circle with a radius of 2 m. What is the magnitude of the instantaneous acceleration of the particle during this time?</p>	
<p>20</p>	<p>A tire 0.50 m in radius rotates at a constant rate of 200 rev/min (٢٠٠ دورة في الدقيقة). Find the speed of a small stone lodged (استقرت) in the tread of the tire (on its outer edge)?</p>	

The End