

College of Sciences
Department of Physics & Astronomy

30

كلية العلوم
قسم الفيزياء والفلك

Midterm Exam Academic Year 1444 H – 1 st Semester			
Exam Information معلومات الامتحان			
Course name:	General Physics*	فيزياء عامة	اسم المقرر:
Course code:	PHYS 103	103 فيز	رمز المقرر:
Exam date:	Sunday 09/10/2022G	الأحد ١٤٤٤/٠٣/١٣ هـ	تاريخ الامتحان:
Exam time:	07:00 PM	٧:٠٠ 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:

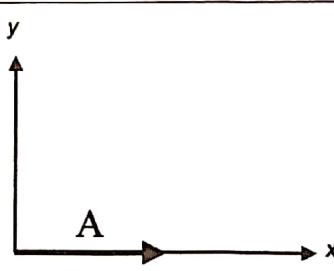
- إظهار بطاقة الطالب الجامعية.
- الجولات والساعات الذكية يجب أن تكون خارج قاعة الاختبار.
- كتابة الإجابة لكل سؤال بالأحرف الكبيرة (CAPITAL LETTERS) في الجدول أدناه باستخدام قلم الحبر.
- تسلم جميع صفحات الاختبار لأستاذ المادة / المراقب.

Write your 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	A	D
Q. 6	Q. 7	Q. 8	Q. 9	Q. 10
B	A	C	D	C
Q. 11	Q. 12	Q. 13	Q. 14	Q. 15
C	D	B	C	B
Q. 16	Q. 17	Q. 18	Q. 19	Q. 20
D	A	B	A	C

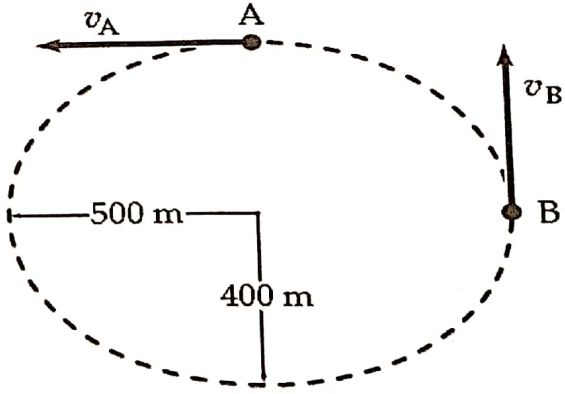
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Take $g = 9.8 \text{ ms}^{-2}$ wherever needed

Q	Multiple choice questions
1	<p>In the following equation $v = 2 B t + C R H$, where v represents the velocity, t represents the time, and $(B, C, R, \text{ and } H)$ represent some physics quantities. What is the dimension of the physics quantity "B" that makes this equation correct from the dimension prospect?</p> <p>A) $[L T^{-1}]$ B) $[L T^{-2}]$ C) $[L T]$ D) $[L M^{-2}]$</p>
2	<p>If a ball is thrown upward, what are its velocity and acceleration at the highest point it reaches:</p> <p>A) $v = 9.8 \hat{j}$, $a = 9.8 \hat{j}$ B) $v = 0$, $a = -9.8 \hat{j}$ C) $v = -9.8 \hat{j}$, $a = 0$ D) $v = 0$, $a = 0$</p>
3	<p>A car driver starts with a velocity of 30 km/h along a road and continues with the same velocity for 5 minutes before accelerating until reaching 60 km/h in 2 minutes and then continues with constant velocity of 60 km/h for 10 minutes. The total distance traveled is:</p> <p>A) 14 km B) 7 km C) 28 km D) 17 km</p>
4	<p>A car initially moving with velocity 15 m/s, brakes at a constant rate of 3 m/s². How far will it take to stop?</p> <p>A) 37.5 m B) 25 m C) 50.0 m D) 105 m</p>
5	<p>Ali throws a ball straight up to Omar, who is standing on a balcony 3.8 m above Ali. When Omar catches the ball, it is still moving upward at a speed of 2.8 m/s. With what initial speed did Ali throw the ball?</p> <p>A) 7 m/s B) 12.3 m/s C) 10.6 m/s D) 9.1 m/s</p>
6	<p>Vector A directed with x-axis as shown in figure. If the magnitude of A is 3 cm. The y-component A_y of A is:</p>  <p>A) 3 B) 0 C) $\sqrt{3}$ D) 9</p>
7	<p>Vector A has y-component $A_y = +13 \text{ m}$. A makes an angle of 32° counterclockwise from the positive y-axis. The x-component A_x of A are:</p> <p>A) - 8.1 m B) 6 m C) 8.1 m D) - 6 m</p>

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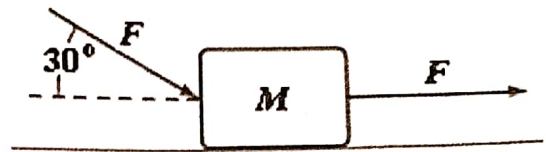
8	<p>If $\vec{A} = 12\hat{i} - 16\hat{j}$ and $\vec{B} = -24\hat{i} + 20\hat{j}$ are two vectors. The magnitude of the new vector $\vec{C} = 2\vec{A} - \vec{B}$ is:</p> <p>A) 30 B) 84 C) 71 D) 63</p>
9	<p>A particle starts from the origin at $t = 0$ with a velocity of $6.0\hat{i}$ m/s and moves in the x-y plane with a constant acceleration of $(-2.0\hat{i} + 4.0\hat{j})$ m/s². At the instant the particle achieves its maximum positive x coordinate, how far is it from the origin?</p> <p>A) 45.5 m B) 36.4 m C) 27.8 m D) 20.1 m</p>
10	<p>The initial speed of a cannon ball is 0.30 km/s. If the ball is to strike a target that is at a horizontal distance of 3.0 km from the cannon, what is the time of flight for the ball?</p> <p>A) 23.3 s B) 18.5 s C) 10.1 s D) 8.1 s</p>
11	<p>A rock is projected from the edge of the top of a building with an initial velocity of 12.2 m/s at an angle of 53° above the horizontal. The rock strikes the ground a horizontal distance of 25 m from the base of the building. Assume that the ground is level and that the side of the building is vertical. How tall is the building?:</p> <p>A) 15.5m B) 18.3m C) 23.5m D) 29.6m</p>
12	<p>A projectile is thrown upward follow the parabolic path. At what position of the path the velocity and acceleration vectors are perpendicular to each other?</p> <p>A) no where B) launching point C) while hitting the ground D) at the maximum height</p>
13	<p>A car travels in an elliptical path (مسار بيضاوي) as shown in the figure. $v_A = 25$ m/s, West, and $v_B = 20$ m/s, North. The ratio of the magnitude of the centripetal acceleration at B to that at A, (a_B / a_A) is:</p>  <p>A) 0.23 B) 0.51 C) 0.12 D) 1</p>
14	<p>A particle is moving in a circle with 2.0 m in radius. If the tangential acceleration is 4.4 m/s² and the total acceleration is 6.0 m/s², then the speed of the particle is:</p> <p>A) 6.2 m/s B) 1.1 m/s C) 2.9 m/s D) 3.5 m/s</p>

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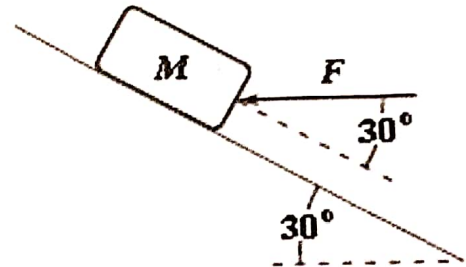
The horizontal surface on which the block slides is frictionless. If $F = 20 \text{ N}$ and $M = 5 \text{ kg}$, what is the magnitude of the resulting acceleration of the block?



- A) 13.4 m/s^2 B) 7.5 m/s^2 C) 18.1 m/s^2 D) 29.8 m/s^2

16

A block is pushed up a frictionless 30° incline by an applied force as shown. If $F = 25 \text{ N}$ and $M = 3 \text{ kg}$, what is the magnitude of the resulting acceleration of the block?



- A) 4.2 m/s^2 B) 3.4 m/s^2 C) 1.6 m/s^2 D) 2.3 m/s^2

17

If the only forces acting on a 2.0 kg mass are $F_1 = (3i - 8j) \text{ N}$ and $F_2 = (5i + 3j) \text{ N}$, what is the magnitude of the acceleration of the particle?

- A) 4.7 m/s^2 B) 1.3 m/s^2 C) 5.8 m/s^2 D) 2.9 m/s^2

18

A book is placed on a chair. Then a laptop is placed on the book. The floor exerts a normal force on:

- A) upwards on the chair B) only on the chair C) only on the book D) on all three and downwards on the book

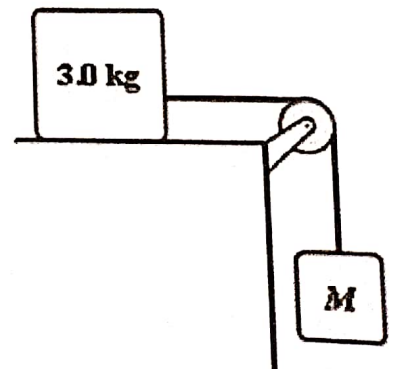
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A 5.0 kg mass is suspended by a string from the ceiling of an elevator that is moving upward with a speed which is decreasing at a constant rate of 2.0 m/s in each second. What is the tension in the string supporting the mass?

- A) 39 N B) 27 N C) 19 N D) 44 N

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The system shown is released from rest and moves 50 cm in 1.0 s . What is the value of M ? All surfaces are frictionless.



- A) 0.85 kg B) 0.14 kg C) 0.34 kg D) 0.62 kg

The End