College of Sciences
Department of Physics & Astronomy

30

كلية العلوم
قسم الفيزياء والفلك

Midterm Exam Academic Year 1444 H – 1st 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 مساءاً	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:

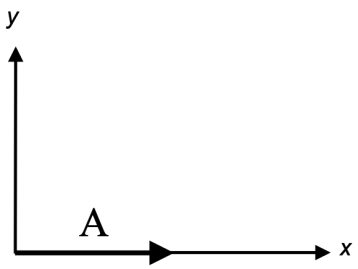
- إظهار بطاقة الطالب الجامعية.
- الجوالات والساعات الذكية يجب أن تكون خارج قاعة الاختبار.
- كتابة الإجابة لكل سؤال بالأحرف الكبيرة (CAPITAL LETTERS) في الجدول أدناه باستخدام قلم الحبر.
- تسلم جميع صفحات الاختبار لأستاذ المادة / المراقب.

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

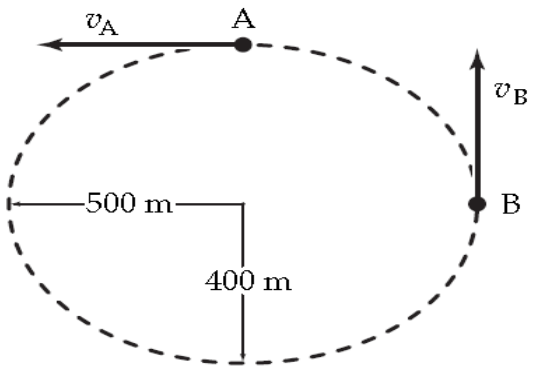
Q. 1	Q. 2	Q. 3	Q. 4	Q. 5
B	B	A	A	D
Q. 6	Q. 7	Q. 8	Q. 9	Q. 10
B	A	C	D	C
Q. 11	Q. 12	Q. 13	Q. 14	Q. 15
C	D	B	C	B
Q. 16	Q. 17	Q. 18	Q. 19	Q. 20
D	A	B	A	C

Name: _____ ID:_____

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

Q	Multiple choice questions
1	In the following equation $\mathbf{v = 2\,B\,t + C\,R\,H}$, where **v** represents the velocity, **t** represents the time, and (**B, C, R,** and **H**) represent some physics quantities. What is the dimension of the physics quantity "**B**" that makes this equation correct from the dimension prospect? A) [L T^{-1}] B) [L T^{-2}] C) [L T] D) [L M^{-2}]
2	If a ball is thrown upward, what are its velocity and acceleration at the highest point it reaches: 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
3	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: A) 14 km B) 7 km C) 28 km D) 17 km
4	A car initially moving with velocity **15 m/s**, brakes at a constant rate of **3 m/s^2**. How far will it take to stop? A) 37.5 m B) 25 m C) 50.0 m D) 105 m
5	Ali throws a ball straght up to Omar ,who is standing on a balacony **3.8 m** above Ali. When Omar cathes the ball, it is still moving upward at a speed of **2.8 m/s**. With what initial speed did Ali throw the ball ? A) 7 m/s B) 12.3 m/s C) 10.6 m/s D) 9.1 m/s
6	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:  A) 3 B) 0 C) $\sqrt{3}$ D) 9
7	Vector **A** has y-component A_y = + **13 m**. **A** makes an angle of **32°** counterclockwise from the positive y-axis. The x-component A_x of **A** are: A) - 8.1 m B) 6 m C) 8.1 m D) - 6 m

Name: _____ ID:_____

8	If $\vec{A} = 12\hat{\imath} - 16\hat{\jmath}$ and $\vec{B} = -24\hat{\imath} + 20\hat{\jmath}$ are two vectors. The magnitude of the new vector $\vec{C} = 2A - B$ is: A) 30 B) 84 C) 71 D) 63
9	A particle starts from the origin at $t = 0$ with a velocity of **6.0i m/s** and moves in the ***x-y* plane** with a constant acceleration of **(–2.0i + 4.0j) m/s^2**. At the instant the particle achieves its maximum positive ***x*** coordinate, how far is it from the origin? A) 45.5 m B) 36.4 m C) 27.8 m D) 20.1 m
10	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? A) 23.3 s B) 18.5 s C) 10.1 s D) 8.1 s
11	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^o** 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?: A) 15.5m B) 18.3m C) 23.5m D) 29.6m
12	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? A) no where B) launching point C) while hitting the ground D) at the maximum height
13	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:  A) 0.23 B) 0.51 C) 0.12 D) 1
14	A particle is moving in a circle with **2.0 m** in radius. If the tangential acceleration is **4.4 m/s^2** and the total acceleration is **6.0 m/s^2,** then the speed of the particle is: A) 6.2 m/s B) 1.1 m/s C) 2.9 m/s D) 3.5 m/s

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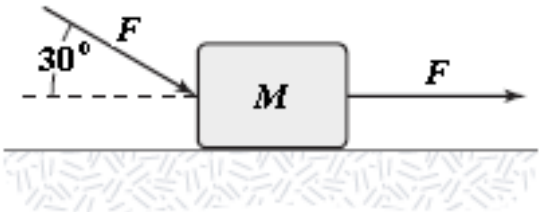
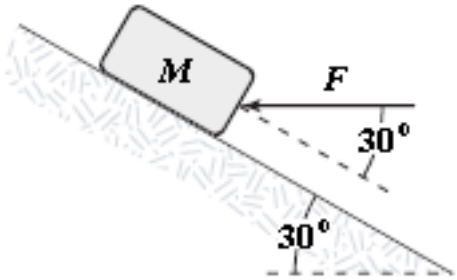
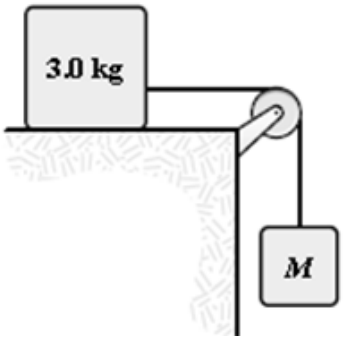
15	The horizontal surface on which the block slides is frictionless. If F = **20 N** and M = **5 kg**, what is the magnitude of the resulting acceleration of the block?  A) 13.4 m/s^2 B) 7.5 m/s^2 C) 18.1 m/s^2 D) 29.8 m/s^2
16	A block is pushed up a frictionless **30°** incline by an applied force as shown. If F = **25 N** and M = **3 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 $\mathbf{F_1=(3i-8j)N}$ and $\mathbf{F_2=(5i+3j)N}$, 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 and downwards on the book B) only on the chair C) only on the book D) on all three
19	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
20	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