PHYSICS فيزياء

- ☑ *Where necessary use the constant in the table below.*
- ☑ *Answer all questions on the paper.*

$g = 9.81 \, m/s^2$		

PART 1

30

1st Question

Place a tick (✓) inside the box to the left of the most appropriate answer for each of the following:

1- Newton provided an explanation for why objects fall ,he proposed that the objects fall because the object and Earth are attracted by a force. Which of the following represents what Newton said?
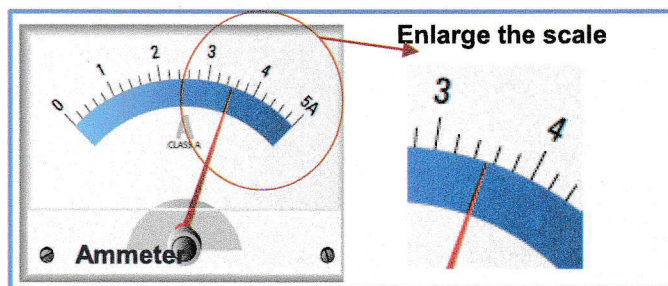
☐ A scientific model   ☐ A scientific hypothesis

☐ A scientific theory   ☐ A scientific law

2- A period of time is $(2.0 \times 10^{-4} s)$,which of the following is **true** for this period with prefixes?

☐ $0.20 \ ms$ ☐ $2.0 \ \mu s$

☐ $0.20 \ \mu s$ ☐ $2.0 \ ms$

3- Depending on the figure, what is the **measure** shown on the meter ? include the uncertainty .

☐ $(3.6 \mp 0.2) A$

☐ $(3.4 \mp 0.2) A$

☐ $(3.6 \mp 0.1) A$

☐ $(3.4 \mp 0.1) A$

Enlarge the scale

Ammeter

4- Depending on the equation :
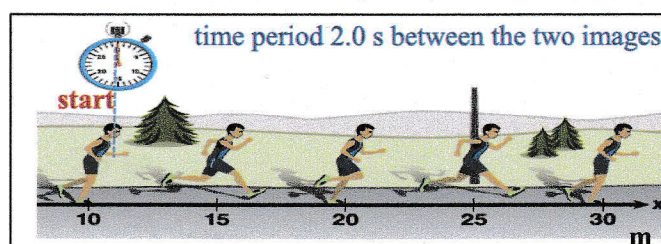
$$[y = (3.0 \ m/s) + (X \times 2.0 \ s) \ ]$$

What is the **name** of the physical quantity represented by the X symbol and its **unit** ?

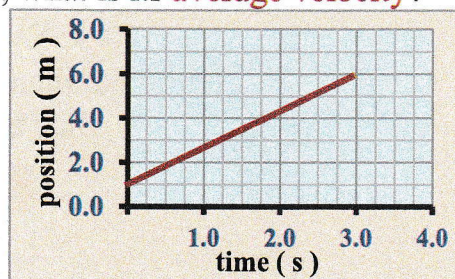|	the name of quantity X	the unit of quantity X
☐	Length	m
☐	Time	s
☐	Acceleration	$m \ s^{-2}$
☐	Velocity	$m \ s^{-1}$

5-Depending on the figure, what is the **displacement** for the **runner** after **(6.0 s)** from the beginning of his movement?

☐ $+25 \ m$ ☐ $+15 \ m$

☐ $-25 \ cm$ ☐ $-15 \ m$

time period 2.0 s between the two images

start

6- Depending on the (position - time) graph for an object, what is its **average velocity**?
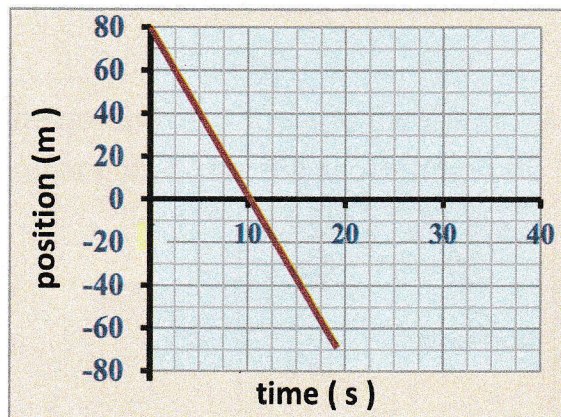
- ☐ $+2.0\ m/s$
- ☐ $-2.0\ m/s$
- ☐ $+1.7\ m/s$
- ☐ $-1.7\ m/s$

7- Depending on the (position - time) graph for an object moving to the west.
What is the position of the object after (30 s) if it continues its motion with the same average velocity?

- ☐ $-240\ m$
- ☐ $-160\ m$
- ☐ $-110\ m$
- ☐ $-80\ m$

8- Depending on the particle model in the figure for the motion of a vehicle, which of the following is **true** for the vehicle's motion?

- ☐ the vehicle moved at constant velocity
- ☐ the vehicle moved faster
- ☐ the vehicle moved slower
- ☐ the vehicle started to move faster and then slower

9- Depending on the graph for an object motion, what is the **acceleration** of the object between (2.0 s) to (4.0)?

- ☐ $0.0\ m/s^2$
- ☐ $+15\ m/s^2$
- ☐ $+11\ m/s^2$
- ☐ $+5.0\ m/s^2$

10- A ball that starts at rest is in free fall for (**4.0 s**). What is the ball's **displacement** after (**2.1 s**) ?

- ☐ $-78\ m$
- ☐ $-22\ m$
- ☐ $-39\ m$
- ☐ $-11\ m$

11– The final position of a ball motion is given from the following equation
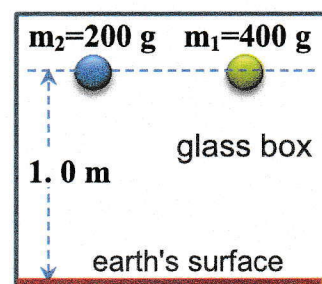
$$x_f = +0.70 + 3.0\,t + 2.0\,t^2$$

(Physical quantities in the equation measured by international units) .
What are the initial position and initial velocity for the ball?

	initial velocity	initial position
☐	$+2.0\ m/s$	$+0.70\ m$
☐	$+3.0\ m/s$	$+0.70\ m$
☐	$+2.0\ m/s$	$+3.0\ m$
☐	$+3.0\ m/s$	$+3.0\ m$

12–There are two balls in a glass box with no air on the ground as shown in the figure. If the two balls start falling together, which of the following is correct for the acceleration of the two balls?

☐ the acceleration for m_1 is greater than it is for m_2 .

☐ the acceleration for m_2 is greater than it is for m_1 .

☐ the acceleration for m_2 and m_1 is equal .

☐ the acceleration for m_1 equals half of it is for m_2

13– In the figure , which of the forces (F_1 , F_2 , F_3) are field force?

☐ F_1

☐ F_2

☐ F_3

☐ F_1 and F_2

14–A mass of (**15 kg**) on a weight scale in an elevator floor. What is the reading recorded by the scale when the elevator moves with an acceleration (**1.9 m/s²**) downward?

☐ 28 N ☐ 150 N

☐ 120 N ☐ 180 N

15–Which of the following is **true** for an interaction pair depending on Newton's third law?

☐ exerted in the same time ☐ are different in magnitude

☐ in the same direction ☐ exerted on the same object

PART2

2nd Question 15

50

6

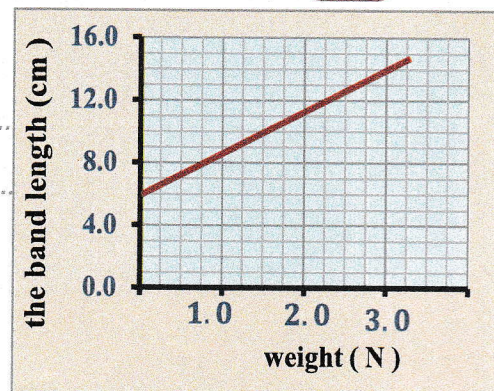The graph is showing changes in the length of a rubber band for different weights hanging on its free side.

Answer (16 ,17 , 18)

16- What is the name of the quantity that represents:

- Independent variable? ....

- Dependent variable? ....

17- What is the original length of the rubber band ?

....

18- How long does the rubber band increase from the original length when a (3.0 N) is attached?

....

the band length (cm) vs weight (N)

— The following table shows Maryam's positions and times when she moved to the north inside her school on a straight line.

Time(s)	0	20	40	60	80	100	120	140
Position (m)	0	10	20	30	40	50	60	70

Answer (19 ,20 , 21)

9

19– Draw a position-time graph to represent Maryam's motion in the school.

20– Calculate the average velocity of Maryam using the position-time graph.

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21- Calculate the average velocity of Maryam in (m/s) if she reaches back in (2.0) minutes.

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3rd Question

20

Depending on the (velocity - time) graph for the motion made by Rashed on a bicycle,
Rashed began his motion to the north.

14

Answer (22 ,23 , 24)

22 - What is the time interval that Rashed moves at a **constant** velocity ?

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23 - Calculate the **acceleration** of Rashed's motion during the time interval (20 s to 24 s).
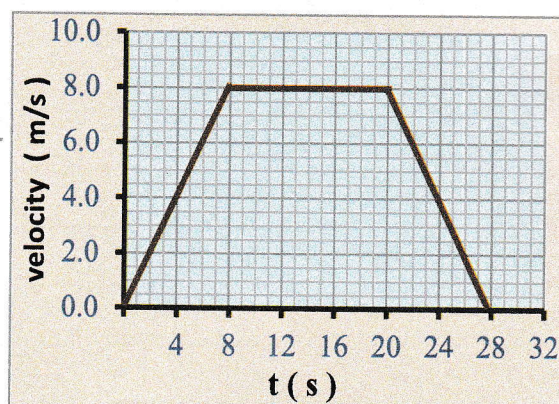
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24- Calculate the magnitude of total **displacement** of Rashed from (0.0s) to (28 s).

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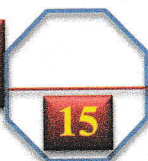..

– The graph below shows the changes in the net force acts on an object and its acceleration.

6

25- Calculate the **slope** of the graph and write the name of the physical quantity it represents.

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4th Question

15

A workman pushes a large box with a mass of $(24\ kg)$ for a distance of $(15\ m)$ over a frictionless surface. He exerts a constant force $(60\ N)$. If the box starts from the rest,

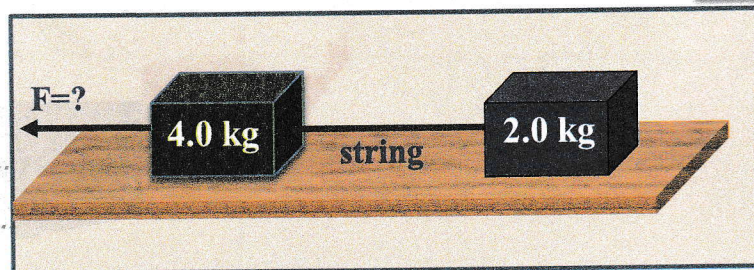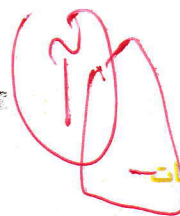**26-** Calculate the **velocity** of the box after $(10\ m)$.

9

In the figure, two blocks are placed on a smooth horizontal surface and are connected by a string. When force **F** is applied as shown in the figure, the two blocks move with constant acceleration $(1.5\ m/s^2)$.

6
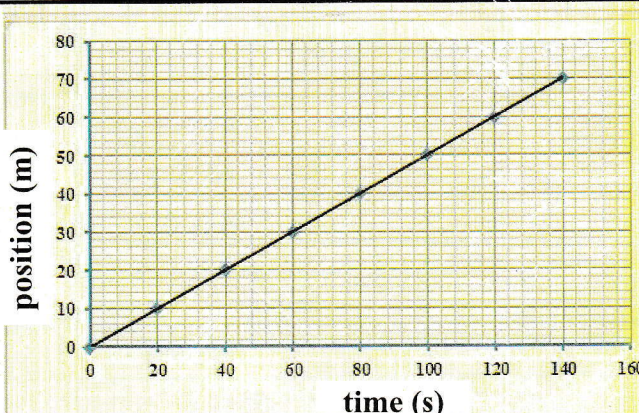
27- Calculate the **magnitude** of force **F**.

F=? 4.0 kg string 2.0 kg

The End

Physics -Mark –Scheme Grade 9 Advanced Term 1 -2019/2020 (1)

Marks J			Answer		Questions	
		2	A scientific theory		1	
		2	0.20 ms		2	
		2	$(3.6 \mp 0.1)\,A$		3	
		2	Acceleration	$m\,s^{-2}$	4	
		2	$+15\,m$		5	
		2	$+1.7\,m/s$		6	
		2	$-160\,m$		7	
30	30	2	the vehicle moved slower		8	1St.
		2	$+15\,m/s^2$		9	
		2	$-22\,m$		10	
		2	$+3.0\,m/s$	$+0.70\,m$	11	
		2	the acceleration for m_2 and m_1 is equal .		12	
		2	F_3		13	
		2	120 N		14	
		2	exerted in the same time		15	
			Don't accept any other answers.			
		1	the weight		16	
	6	1	the band length			
		2	6.0 cm		17	
		2	8.0 cm		18	

15	4	4	1	the time axis				19	2nd.
			1	the position axis					
			2	draw the graph					

position (m) vs time (s) graph, straight line from origin through (140, 70)

	3	1	$v_{avg} = \dfrac{\Delta x}{\Delta t}$	20
		1	$v_{avg} = \dfrac{70 - 10}{140 - 20}$	
		1	$v_{avg} = +0.50\ \text{m/s}$	
		1	$v_{avg} = \dfrac{-70}{\ }$	

Marks J			Answer	Questions
	2		(8.0 s to 20 s)	22
	1		$$a = \frac{\Delta v}{\Delta t}$$	
	3		$$a = \frac{4.0 - 8.0}{4.0}$$	23
14	1		$$a = 1.0 \text{ m/s}^2$$	
	2		the magnitude of displacement is equal to the area under the graph	
20	3		$$= \frac{1}{2}(8.0 \times 8.0) + (12 \times 8.0) + \frac{1}{2}(8.0 \times 8.0)$$	24
	2		$$= 156 \text{ m}$$	
	2		$$\text{slope} = \frac{(0.40 - 0.20)m/s^2}{(8.0 - 4.0)N}$$	
6	2		$$= 0.050 \frac{m/s^2}{N}$$	25
	2		$$\frac{1}{mass} \quad or \quad \frac{1}{m}$$	
	2		$$a = \frac{F}{m}$$	
	1		$$a = \frac{60}{24}$$	
9	1		$$a = 2.5 \text{ m/s}^2$$	26
15	2		$$v_f^2 = v_i^2 + 2 \, a\Delta x$$	
	2		$$v_f^2 = 0 + 2 \times 2.5 \times 10$$	
	1		$$v_f = 7.1 \text{ m/s}$$	
	2		$$F_{net} = m \, a$$	
6	3		$$F_{net} = (4.0 + 2.0) \times 1.5$$	27
	1		$$F_{net} = 9.0 \text{ N}$$	

The end

80				Instructions
	30		Only the first question	Part One
	50		The questions 2 ,3 and 4	Part Two