Rosary School – Marj Elhamam
First Semester 2025/2026
Physics Second Month Assessment

No. of Pages: (12)	No. of Questions: (7)	Mark: (/ 51)
Grade: 9 ( )		Date:18 / 10 / 2025 Duration: 60 min.

Instructions

• Write your name in the space provided.

• Write in a **black pen**. You may use a **pencil** for any **diagrams or rough working.**

• Answer all questions.

• Do not use correction fluid.

• Answer the questions in the spaces provided.

• Show all the steps in any calculations and state the unit.

Information

• The total mark for this paper is 20.

• The marks for each question are shown in brackets.

• Calculators are allowed.

Advice

• Read each question carefully before you start to answer it.

• Try to answer every question.

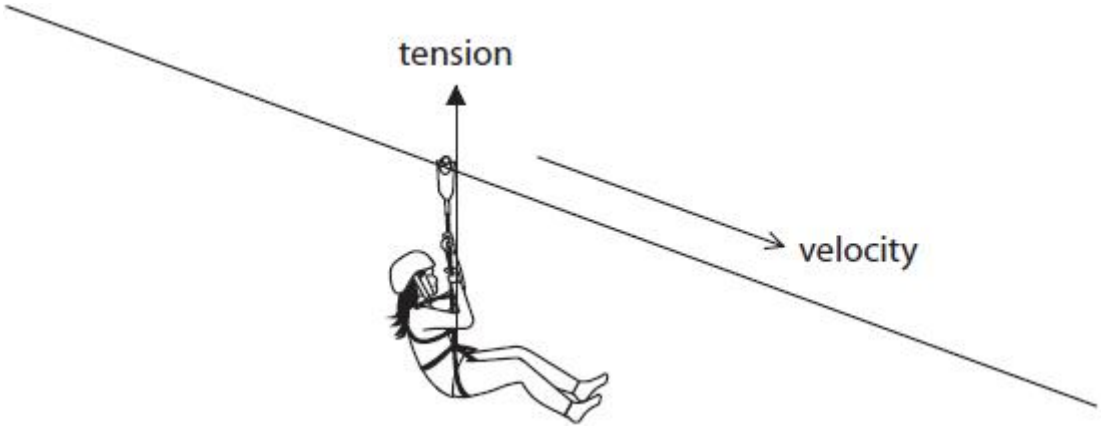
• Check your answers if you have time at the end.

• Write your answers neatly and in good English.

Question 1: (/ 5)

The diagram shows a child on a zip-line ride.

During the ride the child slides along a metal wire with the velocity in the direction shown in the diagram.



The diagram also shows the tension force acting on the safety harness the child is wearing.

(a) Force and velocity are examples of vector quantities.

State what is meant by the term **vector quantity**. **(1)**

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(b) Draw labelled arrows on the diagram to show two other forces that act on the child. **(4)**

(Total for question = 5 marks)

(**Q02 4WPH1/1P, June 2022**)

Question 2: (/ 5)

A student investigates the motion of a trolley along a horizontal runway using the apparatus in Figure 2.

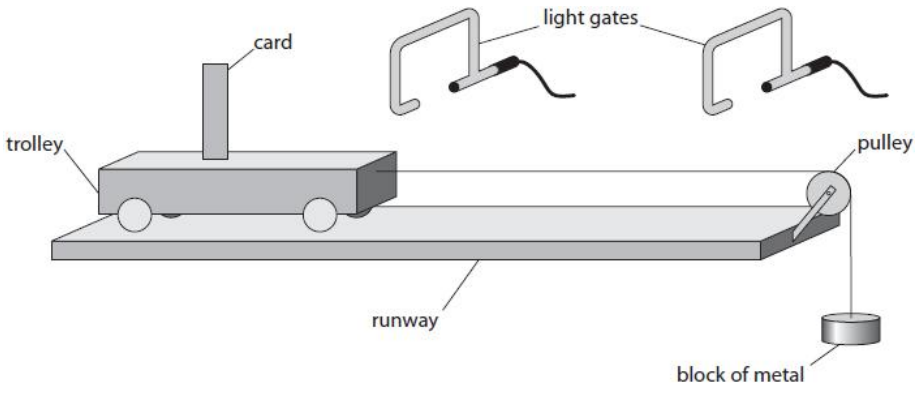


Figure 2

A trolley is attached to a string passing over a pulley.

A block of metal hangs on the end of the string.

Each light gate measures the time it takes for the card to pass through the gate.

When the trolley is released, it moves along the track.

A computer measures the time it takes for the card to pass between each light gate.

(i) The card took 0.080 s to pass through the first light gate.

The width of the card is 5 cm.
Calculate the average speed, in m/s, of the trolley through the first light gate.

(2)

average speed = ... m/s

Another trolley passes through the first light gate at a velocity of 0.72 m/s.

This trolley passes through the second light gate at a velocity of 1.1 m/s.

The time it takes for the card on the trolley to travel between the two light gates is 0.53 s.

(ii) State the equation relating acceleration, change in velocity and time.

(1)

(iii) Calculate the acceleration of the trolley between the two light gates.

(2)

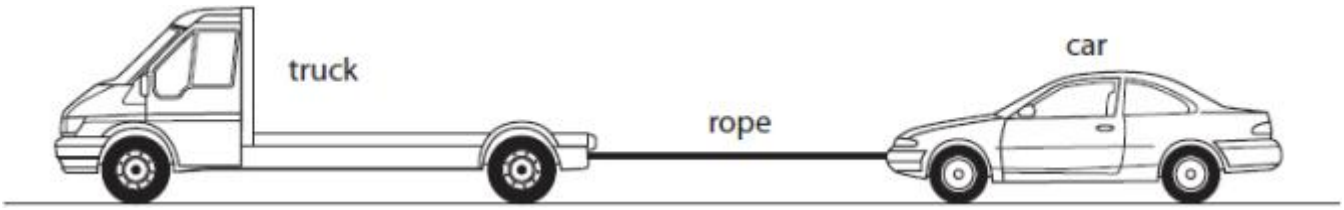
acceleration = ... m/s^2

(Total for question = 5 marks)

(**Q02a 1SC0/1PF, SAM**)

Question 3: (/ 6)

The diagram shows a truck using a rope to pull a car along a level road.



(a) The truck and car are travelling at a velocity of 14 m / s.

The truck and car then accelerate at 1.6 m/s^2 until they are travelling at a velocity of 22 m / s.

(i) State the formula linking acceleration, change in velocity and time taken.

(1)

(ii) Calculate the time taken for the truck and car to accelerate from 14 m / s to 22 m / s.

(3)

time taken = ... s

(b) The rope breaks so the car and the truck are no longer connected.

The engine of the car is not working.

Explain what happens to the motion of the car after the rope breaks.

(2)

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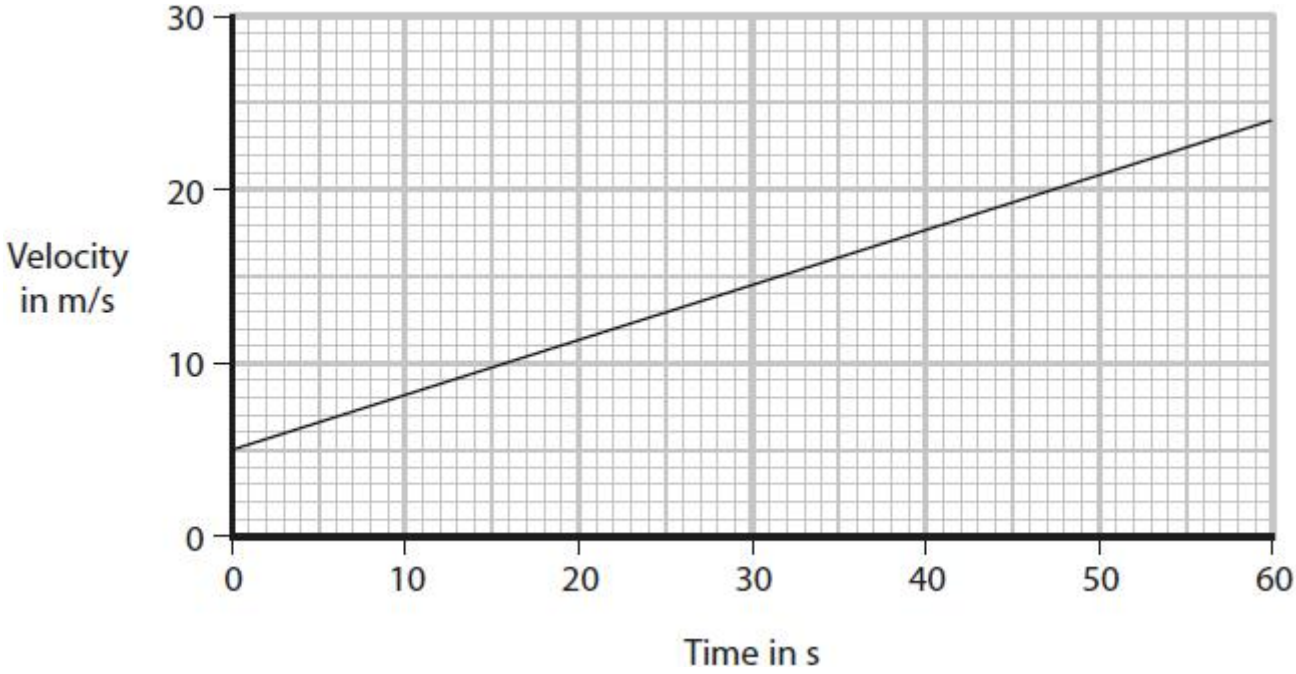
(Total for question = 6 marks)
(**Q02 4SS0/1P, Nov 2021**)

Question 4: (/ 6)

The velocity-time graph shows how the velocity of a lorry changes with time.



(i) Explain how the graph shows that the lorry has a constant acceleration.

(2)

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(ii) State the formula linking acceleration, change in velocity and time taken.

(1)

(iii) Calculate the acceleration of the lorry.

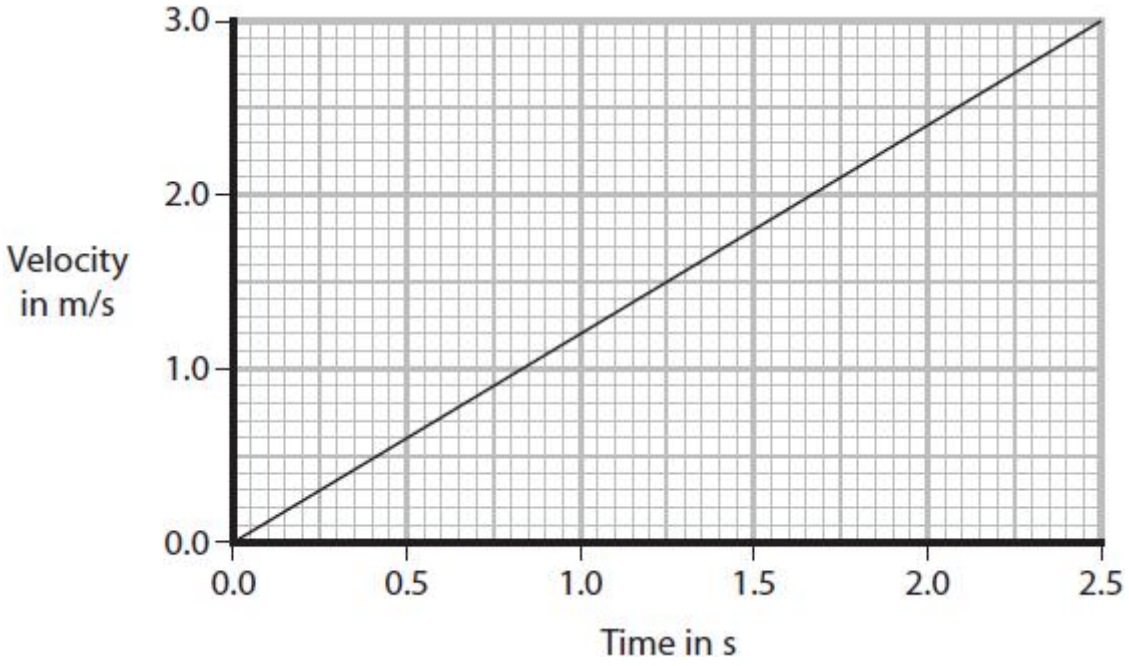
(3)

acceleration = ... m/s^2

(Total for question = 6 marks)
(**Q02(b) 4PH1/1P, Jan 2021**)

Question 5: **(/ 10)**

(a) The graph shows how the velocity of a ball rolling down a long ramp changes with time.



(i) Using the graph, calculate the acceleration of the ball.

(3)

acceleration = ... m/s^2

(ii) State the feature of the graph that gives the distance travelled by the ball.

(1)

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(iii) Calculate the distance travelled by the ball in 2.5 seconds.

(3)

distance = ... m

(b) The table shows data for the ball after it has travelled for two different times.

Time in s	Distance in m
5.0	15
10.0	60

A student suggests that these results obey the relationship:

$$\frac{\text{distance}}{\text{time}^2} = \text{constant}$$

Use data from the table to deduce whether the results support this suggestion.

(3)

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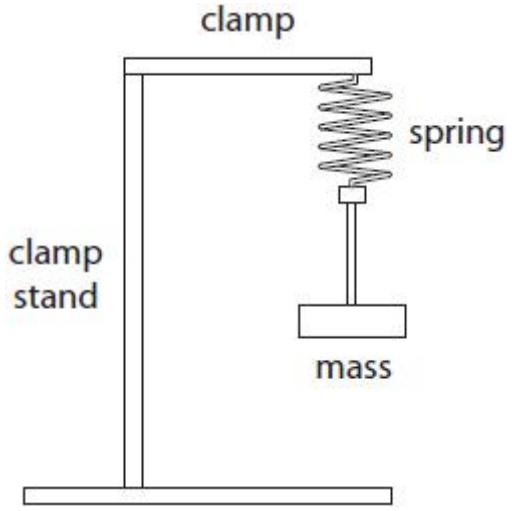
(Total for question = 10 marks)

(**Q04 4WPH1/1P, Nov 2023**)

Question 6: (/ 13)

A student investigates how the extension of a spring varies when the mass attached to the spring is changed.

(a) The diagram shows most of the equipment the student uses in the investigation.



Describe a method the student could use for the investigation.
Your description should include the measurements taken and how the student could obtain accurate results.

(5)

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(b) The student calculates the force each mass applies to the spring.

The table shows the student's results.

Force in N	Extension in cm
0.0	0.0
1.0	2.5
2.0	5.0
3.0	9.8
4.0	10.0
5.0	12.5
6.0	15.5
7.0	19.5

(i) Plot the student's results.

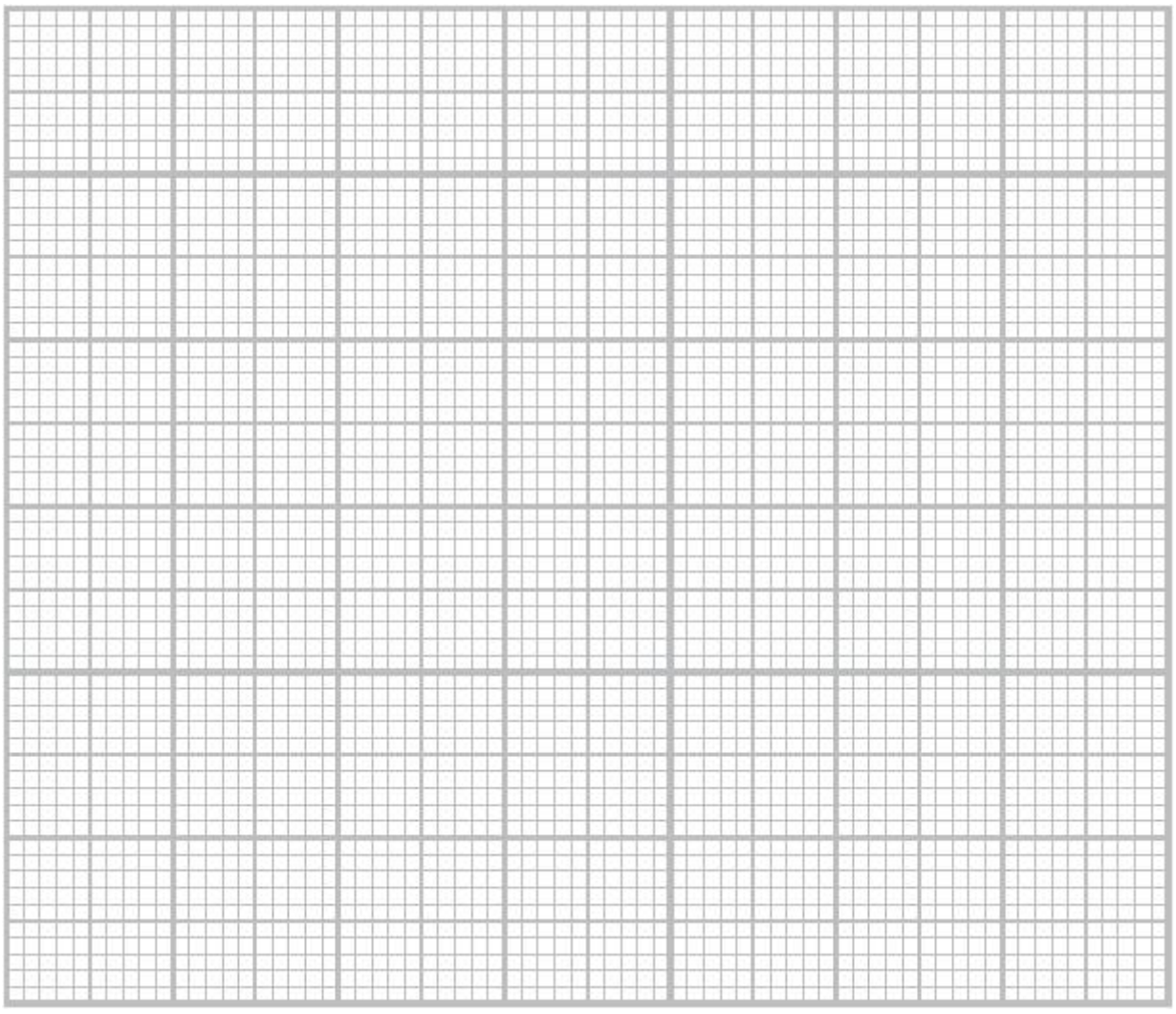
(3)

(ii) Draw a circle around the anomalous point.

(1)

(iii) Draw a line of best fit.

(1)



(iv) Explain whether the spring obeys Hooke's Law.

(3)

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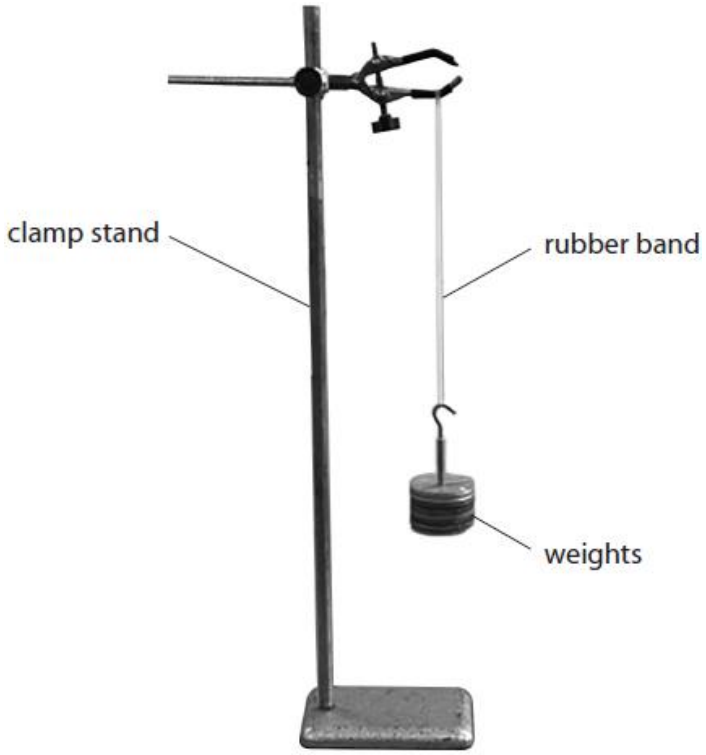
(Total for question = 13 marks)

(**Q09 4PH1/1P, Jan 2022**)

Question 7: (/ 6)

A student uses this apparatus to investigate the stretching of a rubber band.



This is the student's method.

- attach the 12 cm long rubber band to a clamp stand
- hang a 1 N weight from the other end of the rubber band
- determine the extension of the rubber band

The student repeats this method, increasing the weight by 1 N each time until the weight is 10 N.

(a) Describe how the student could determine the extension of the rubber band.

(3)

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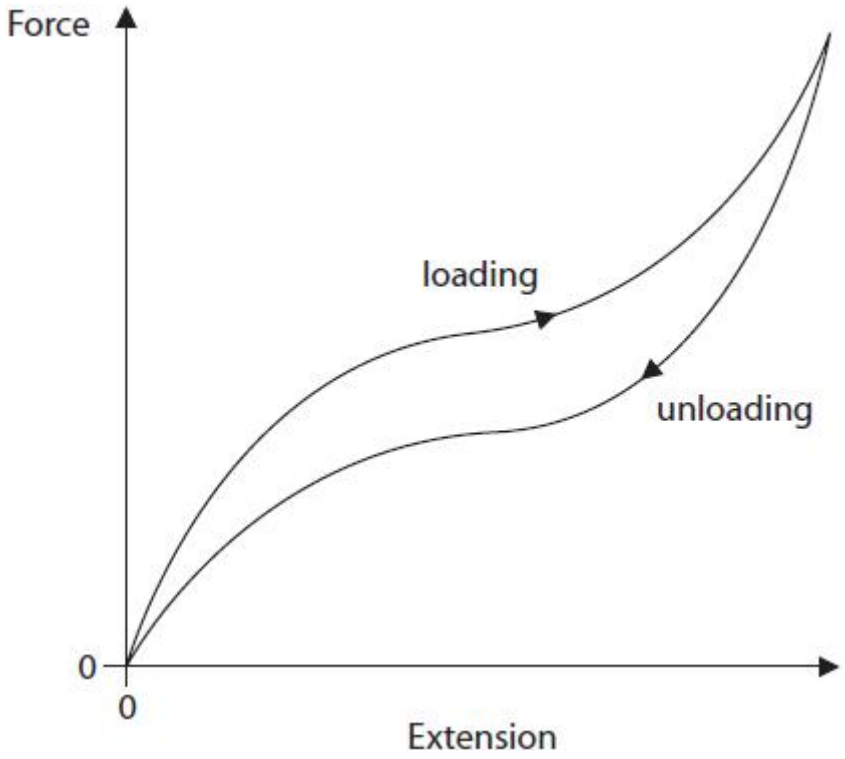
(**Q10(a) 4PH1/1P, Nov 2021**)

(b) The diagram shows a force-extension graph for the rubber band.



(i) State how the graph shows that the rubber band does not obey Hooke's law.

(1)

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(ii) Explain how the graph shows that the rubber band is elastic.

(2)

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(**QU09(b) 4PH1/1PR, June 2024**)

Teacher: Zeina Abu Manneh