نموذج أسئلة اختبار حسب الهيكل

تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ⇦ المناهج الإماراتية ⇦ الصف التاسع المتقدم ⇦ فيزياء ⇦ ملفات متنوعة ⇦ الملف

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التواصل الاجتماعي بحسب الصف التاسع المتقدم

صفحة المناهج الإماراتية على فيسبوك

المواد على تلغرام | التربية الاسلامية | اللغة العربية | اللغة الانجليزية | الرياضيات

المزيد من الملفات بحسب الصف التاسع المتقدم والمادة فيزياء في

1 اختبار الوحدة الأولى Toolkit Physics A انسباير

2 ملزمة هيكل 2026

تحميل تطبيق المناهج للهواتف الذكية

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Grade 9 Advanced Physics — Academic Year 2026–2027

اسلة ضمن الهيكلة للاختبار الرجاء التركيز في نوع السؤال وليس هو بعينه سؤال الاختبار. بل بما يحاكيه كنمط ومخرج تعلم الاجوبه والملف على درايف تاسع متقدم

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SECTION 1: MULTIPLE CHOICE QUESTIONS (MCQs)

Question 1

Learning Outcome: List the common steps of the scientific method used in investigations.

A scientist notices that ice melts at different rates depending on the liquid it is placed in. What is the immediate next step in the scientific method after identifying and stating this problem?

- **[A] Formulate a testable hypothesis based on research and observation.**
- **[B] Publish the final results in a scientific journal.**
- **[C] Draw a permanent scientific conclusion.**
- **[D] Modify existing scientific laws.**

Question 2

Learning Outcome: Explain why scientists use models and give common examples.

A group of researchers builds a complex computer simulation to model global atmospheric pressure changes over the next 50 years. A student claims: *"Because this is a validated scientific model, its predictions are absolute facts and do not require further real-world observational checks."* How would a physicist evaluate this student's claim?

- **[A] Correct; computer models process data without human error, making them absolute facts.**
- **[B] Incorrect; models simplify complex systems and must be continually tested and refined against real-world observations.**
- **[C] Correct; once a scientific model is programmed, it automatically becomes a scientific law.**
- **[D] Incorrect; physical scale models are valid, but computational software models are never scientific.**

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Question 3

Learning Outcome: Differentiate between scientific theory and scientific law.

Consider the following two scientific statements:

- **Statement X: *"In an isolated system, the total mass remains constant during a chemical reaction."***
- **Statement Y: *"Gases consist of microscopic particles in continuous random motion whose elastic collisions exert pressure on container walls."***

Which classification correctly identifies these statements?

- **[A] Statement X is a Theory; Statement Y is a Law.**
- **[B] Statement X is a Law; Statement Y is a Theory.**
- **[C] Both Statement X and Statement Y are scientific Laws.**
- **[D] Statement X is a Hypothesis; Statement Y is a Law.**

Question 4

Learning Outcome: Identify prefixes used with SI units and use them to convert units.

An atomic force microscope measures the step height of a semiconductor crystal as 0.042 µm. A technician needs to enter this value into a system that only accepts measurements in picometers (pm). What value should be entered?

- **[A] 4.2×10^{4} pm**
- **[B] 4.2×10^{1} pm**
- **[C] 4.2×10^{-2} pm**
- **[D] 4.2×10^{7} pm**

Question 5

Learning Outcome: Identify the significant digits in a given number.

How many significant figures are in the recorded measurement 0.02050 kg?

- **[A] 2**
- **[B] 3**
- **[C] 4**
- **[D] 5**

Question 6

Learning Outcome: Use appropriate significant figures to record answers from mathematical operations.

A student measures the sides of a rectangular plate as:

- **Length = 12.45 cm (4 significant figures)**
- **Width = 3.2 cm (2 significant figures)**

She then calculates the perimeter (P = 2L + 2W) and the area (A = L × W). Which pair of reported answers obeys the strict rules of significant figures?

- **[A] Perimeter = 31.3 cm; Area = 39.84 cm²**
- **[B] Perimeter = 31.3 cm; Area = 40. cm²**
- **[C] Perimeter = 31.30 cm; Area = 39.8 cm²**
- **[D] Perimeter = 31 cm; Area = 40. cm²**

Question 7

Learning Outcome: Identify from the shape of the graph if the relationship is linear, quadratic, or inverse.

A student investigates the braking distance of a vehicle. The data yields a graph where doubling the initial speed (v) quadruples the stopping distance (d). If position is plotted on the vertical axis and speed on the horizontal axis, what is the governing mathematical relationship and equation form?

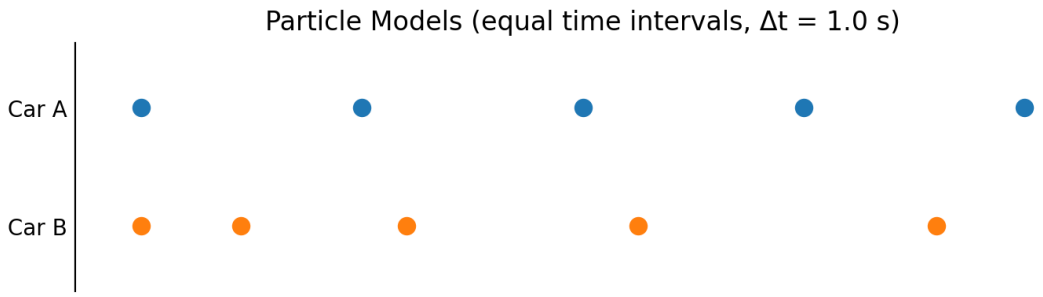
- **[A] Inverse relationship; $d = k/v$**
- **[B] Linear relationship; $d = k\,v + b$**
- **[C] Quadratic relationship; $d = a\,v^2$**
- **[D] Constant relationship; $d = k$**

Question 8

Learning Outcome: Represent changes in position through a particle model.

Below are two particle dot models representing two cars (A and B) moving to the right over equal time intervals ($\Delta t = 1.0$ s):

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Which statement accurately describes their motion?

- **[A] Car A is accelerating; Car B is moving at constant velocity.**
- **[B] Car A is moving at constant velocity; Car B is accelerating.**
- **[C] Both cars are moving at the exact same constant acceleration.**
- **[D] Car A is slowing down; Car B is moving at constant velocity.**

Question 9

Learning Outcome: Classify physical quantities into vector and scalar quantities.

Which list contains ONLY scalar quantities?

- **[A] Distance, Mass, Speed, Work, Energy**
- **[B] Displacement, Velocity, Acceleration, Force**
- **[C] Velocity, Speed, Mass, Position**
- **[D] Distance, Displacement, Acceleration, Pressure**

Question 10

Learning Outcome: Convert a particle model to a position-time graph and vice versa.

A dot diagram shows dots spaced increasingly further apart as an object moves in the positive x-direction. Which graph correctly transforms this particle model into a position-time (x-t) graph?

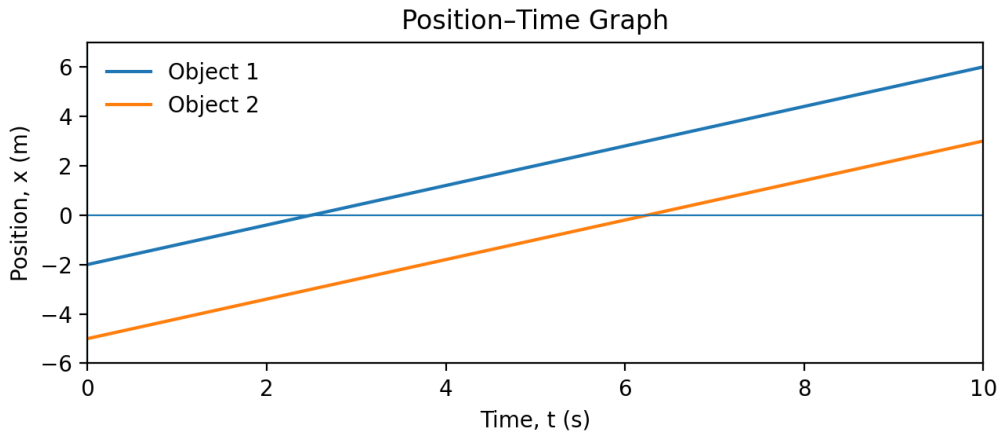
- **[A] A horizontal straight line with zero slope.**
- **[B] A straight line sloping upward with a constant positive slope.**
- **[C] A curve starting at the origin and bending upwards with an increasing positive slope.**
- **[D] A curve starting at a high position and sloping downward with a constant negative slope.**

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Question 11

Learning Outcome: Interpret a position-time graph that represents the motion of multiple objects.

The graph below displays the position-time lines for Object 1 and Object 2:



Both lines are parallel straight lines, but Object 1 crosses the t-axis at t_1, while Object 2 crosses at t_2 > t_1. Which deduction is correct?

- **[A] Object 1 moves faster than Object 2.**
- **[B] Object 2 moves faster than Object 1.**
- **[C] Both objects move with identical average velocities, but Object 1 started earlier.**
- **[D] Object 1 is accelerating while Object 2 is at rest.**

Question 12

Learning Outcome: Differentiate between uniform and non-uniform motion.

An object moving in a straight line covers equal displacements in equal intervals of time. What type of motion does this represent?

- **[A] Non-uniform motion with constant acceleration.**
- **[B] Uniform motion with zero acceleration.**
- **[C] Uniformly accelerated free-fall motion.**
- **[D] Non-uniform motion with changing direction.**

Question 13

Learning Outcome: Describe the motion of an object if its velocity and acceleration are in the same or opposite

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directions.

A car moves along a horizontal track. Its velocity vector points in the negative direction (v < 0) while its acceleration vector also points in the negative direction (a < 0). What is the physical behavior of the car?

- **[A] It is moving in the negative direction and slowing down.**
- **[B] It is moving in the negative direction and speeding up.**
- **[C] It is moving in the positive direction and speeding up.**
- **[D] It has stopped completely and remains stationary.**

Question 14

Learning Outcome: Apply the equation $v_f = v_i + a\,t$.

A train traveling at 15.0 m/s accelerates at a constant rate of 1.50 m/s² for 6.00 s. What is its final velocity?

- **[A] 24.0 m/s**
- **[B] 9.0 m/s**
- **[C] 30.0 m/s**
- **[D] 13.5 m/s**

Question 15

Learning Outcome: Apply $v_f^2 = v_i^2 + 2\,a\,(x_f - x_i)$.

A jet landing on an aircraft carrier touches down at 70.0 m/s and must be brought to rest ($v_f = 0$) within a maximum runway length of 98.0 m. What constant acceleration must the arresting cable exert on the jet?

- **[A] -25.0 m/s²**
- **[B] -35.7 m/s²**
- **[C] +25.0 m/s²**
- **[D] -50.0 m/s²**

Question 16

Learning Outcome: Describe the motion of an object under free fall during its rising and falling motion.

A ball is thrown straight upward into the air, reaches a maximum height, and falls back down to the release point. Neglecting air resistance, how do the velocity and acceleration vectors compare during the upward flight versus the downward flight?

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- **[A] Upward: v upward, a downward | Downward: v downward, a upward**
- **[B] Upward: v upward, a downward | Downward: v downward, a downward**
- **[C] Upward: v upward, a upward | Downward: v downward, a downward**
- **[D] Upward: v downward, a downward | Downward: v upward, a upward**

SECTION 2: QUESTIONS (FRQs)

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Question 17

A student uses a vernier caliper (finest scale division: 0.01 cm) to measure the side length of several aluminum cubes to determine how cube size affects total mass.

1. **Identify the independent variable and the dependent variable in this experiment.**
2. **The student measures a cube length as 2.50 cm. Her lab partner claims the measurement should be written simply as 2.5 cm.**
    - **Explain why 2.50 cm and 2.5 cm are not scientifically equivalent.**
    - **State the absolute measurement uncertainty of this instrument and write the complete measurement correctly.**
3. **Complete the table below by classifying each physical quantity as Base or Derived, and stating its standard SI Unit:**

Quantity	Classification (Base or Derived)	SI Base / Derived Unit
Length		
Mass		
Density		

1. **Two students measure the density of pure copper (8.96 g/cm³ accepted value):**
    - **Student A reports: (8.95 ± 0.40) g/cm³**
    - **Student B reports: (8.42 ± 0.02) g/cm³**

Which student's measurements are more precise? Which are more accurate? Justify your answer.

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Question 18

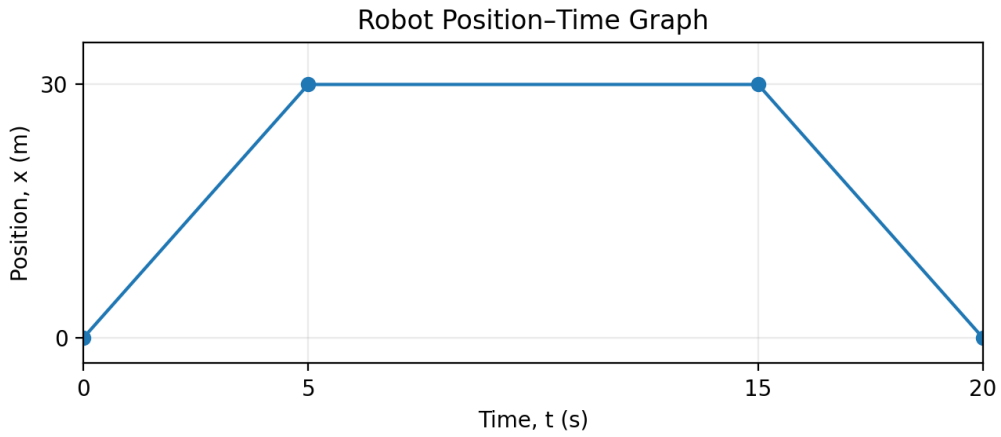
A delivery vehicle moves along a straight North-South road:

- **Stage 1: Travels 600 m North in 40 s.**
- **Stage 2: Stops to unload cargo for 20 s.**
- **Stage 3: Travels 900 m South in 60 s.**

1. **Calculate the total distance traveled by the vehicle over the entire 120 s trip.**
2. **Taking North as the positive direction (+y), calculate the net displacement of the vehicle. Specify both its magnitude and direction.**
3. **Calculate the average speed of the vehicle for the complete 120 s trip.**
4. **Calculate the average velocity of the vehicle. Explain why the average speed is non-zero while the magnitude of average velocity is significantly smaller.**

- ## Question 19

The position-time (x-t) graph below describes the motion of a robot on a straight test track:



- **Interval A (0 to 5 s): Moves from x = 0 m to x = 30 m.**
- **Interval B (5 to 15 s): Remains at position x = 30 m.**
- **Interval C (15 to 20 s): Moves from x = 30 m to x = 0 m.**

1. **Describe the physical motion state of the robot in each interval (Interval A, B, and C).**
2. **Calculate the numerical velocity of the robot during Interval A and Interval C using slope calculations.**
3. **Construct the corresponding velocity-time (v-t) graph for the robot from t = 0 s to t**

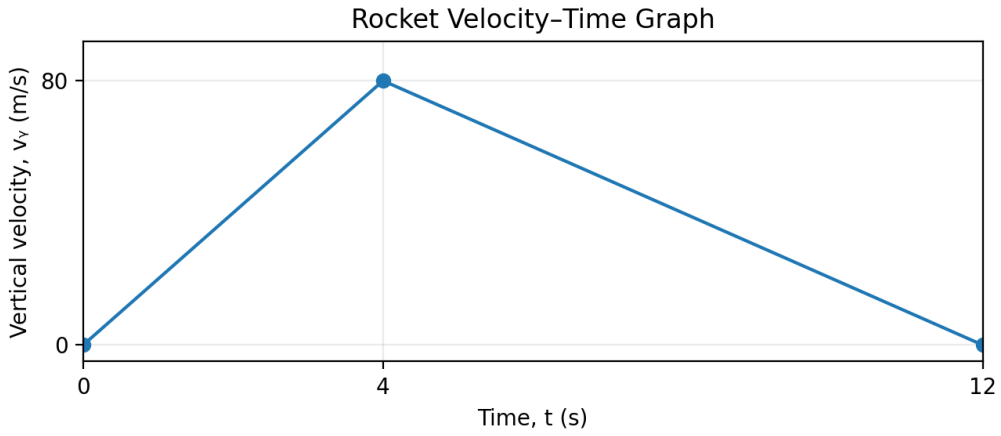
= 20 s.

4. **What is the robot's instantaneous velocity at t = 10 s?**

- **Question 20**

A high-speed test rocket is launched vertically upward. Its vertical velocity (v_y) over the first 12.0 s is represented by the following velocity-time data curve:

- **0 to 4.0 s: Rocket engine fires; velocity increases linearly from 0 m/s to +80.0 m/s.**
- **4.0 to 12.0 s: Engine shuts off; rocket coasts freely under gravity, velocity decreases linearly from +80.0 m/s to 0 m/s at t = 12.0 s.**



1. **Calculate the acceleration during the engine firing period (0 to 4.0 s) and during the coasting period (4.0 to 12.0 s).**
2. **Calculate the maximum height reached by the rocket above the ground at t = 12.0 s by finding the total area under the v-t graph.**
3. **Why does the rocket continue rising between t = 4.0 s and t = 12.0 s even though its acceleration is negative (directed downward)? Explain using kinematic principles.**

Prepared by
Ghada Alassi

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