TS EAMCET May 10 Shift 1

Question Paper with Solutions

Conducted by JNTU, Hyderabad

General Instructions

(i) The test is of 3 hours duration.

(ii) This test paper consists of 160 questions. The maximum marks are 720.

(iii) Physics and Chemistry contains 40 questions each and Mathematics contains 80 questions.

(iv) Each question carries +1 marks for correct answer and there is no negative marking for wrong answer.

Mathematics

1. $f : [-2, 2] \to [-2, 2]$, $g : [-2, 2] \to [0, 4]$ **are two functions defined as**

$$f(x) = \begin{cases} -2, & -2 \leq x \leq 0 \\ x^2 - 2, & 0 \leq x \leq 2 \end{cases}$$

and

$$g(x) = |f(x)| + f(|x|)$$

then

(A) f and g are injective mappings

(B) f and g are surjective mappings

(C) f is bijective mapping and g is injective mapping

(D) f is not bijective mapping and g is surjective mapping

Correct Answer: (D)

f is not bijective mapping and g is surjective mapping

Solution:

Step 1: Analyze the function $f(x)$.

Given:

$$f(x) = \begin{cases} -2, & -2 \le x \le 0 \\ x^2 - 2, & 0 \le x \le 2 \end{cases}$$

For all $x \in [-2, 0]$:

$$f(x) = -2$$

Hence many inputs give the same output.

Therefore, f is not injective.

Also,

$$x^2 - 2 \in [-2, 2]$$

So range of f is:

$$[-2, 2]$$

Hence f is surjective but not injective.

Therefore:

$$f \text{ is not bijective}$$

Step 2: Find $g(x)$.

Given:

$$g(x) = |f(x)| + f(|x|)$$

Now evaluate for different intervals.

For $x \in [-2, 2]$:

$$|x| \in [0, 2]$$

Thus:

$$f(|x|) = x^2 - 2$$

Also:

$$|f(x)| = \begin{cases} 2, & -2 \le x \le 0 \\ |x^2 - 2|, & 0 \le x \le 2 \end{cases}$$

Hence:

$$g(x) = |x^2 - 2| + x^2 - 2$$

Now consider cases.

Case 1: $0 \le x^2 \le 2$

Then:

$$|x^2 - 2| = 2 - x^2$$

So:

$$g(x) = (2 - x^2) + (x^2 - 2) = 0$$

Case 2: $2 \le x^2 \le 4$

Then:

$$|x^2 - 2| = x^2 - 2$$

So:

$$g(x) = 2x^2 - 4$$

As x^2 varies from 2 to 4,

$$g(x) \text{ varies from 0 to 4}$$

Therefore range of g is:

$$[0, 4]$$

Since codomain of g is also $[0, 4]$,

$$g \text{ is surjective}$$

Hence, the correct answer is:

$$\boxed{\text{(D) } f \text{ is not bijective mapping and } g \text{ is surjective mapping}}$$

Quick Tip:

- Injective: different inputs give different outputs
- Surjective: range equals codomain
- Bijective: both injective and surjective

To test surjectivity:

$$\text{Range} = \text{Codomain}$$

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2. The domain of the function

$$f(x) = \frac{1}{\sqrt{|x| - x}}$$

is

(A) $\mathbb{R}$

(B) $(-\infty, 0)$

(C) $(0, \infty)$

(D) $(-\infty, 1)$

Correct Answer: (B)

$$(-\infty, 0)$$

Solution:

For the function

$$f(x) = \frac{1}{\sqrt{|x| - x}}$$

the expression inside the square root must be positive and denominator cannot be zero.

Therefore:

$$|x| - x > 0$$

Step 1: Consider $x \geq 0$.

If $x \geq 0$, then:

$$|x| = x$$

Hence:

$$|x| - x = x - x = 0$$

Denominator becomes zero, which is not allowed.

So no non-negative value belongs to domain.

Step 2: Consider $x < 0$.

If $x < 0$, then:

$$|x| = -x$$

Thus:

$$|x| - x = -x - x = -2x$$

Since $x < 0$,

$$-2x > 0$$

Hence denominator is real and non-zero.

Therefore all negative values are allowed.

So the domain is:

$$(-\infty, 0)$$

Hence, the correct answer is:

$$\boxed{(-\infty, 0)}$$

Quick Tip:

For functions involving square roots in denominator:

$$\text{Expression inside root} > 0$$

because:

- square root requires non-negative quantity
- denominator cannot be zero

Also remember:

$$|x| = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$$

3. For any $n \in \mathbb{N}$,

$$4^n + 15n - 1$$

is divisible by

(A) 2

(B) 9

(C) 5

(D) 6

Correct Answer: (D)

$$6$$

Solution:

We check divisibility by each option.

Step 1: Check divisibility by 2.

For $n \geq 1$:

$$4^n = \text{even}$$

$$15n = \begin{cases} \text{odd}, & n \text{ odd} \\ \text{even}, & n \text{ even} \end{cases}$$

Hence divisibility by 2 is not always guaranteed directly from individual terms.

Now test divisibility by 6.

Step 2: Check divisibility by 2.

$$4^n = \text{even}$$

$$15n = \text{same parity as } n$$

Thus:

$$4^n + 15n - 1$$

is always even because:

$$\text{even} + \text{odd} - \text{odd} = \text{even}$$

or

$$\text{even} + \text{even} - \text{odd} = \text{odd}$$

Instead use modulo method.

Since:

$$4^n \equiv 0 \pmod{2}$$

$$15n \equiv n \pmod{2}$$

Therefore:

$$4^n + 15n - 1 \equiv n - 1 \pmod{2}$$

For natural numbers in given MCQ context, check modulo 3 first.

Step 3: Check divisibility by 3.

Since:

$$4 \equiv 1 \pmod{3}$$

Hence:

$$4^n \equiv 1^n \equiv 1 \pmod{3}$$

Also:

$$15n \equiv 0 \pmod{3}$$

Therefore:

$$4^n + 15n - 1 \equiv 1 + 0 - 1 \equiv 0 \pmod{3}$$

So expression is always divisible by 3.

Step 4: Check divisibility by 2.

$$4^n = \text{multiple of } 2$$

$$15n - 1$$

is always odd minus odd or even minus odd depending on parity of n.

Testing values:

For $n = 1$:

$$4 + 15 - 1 = 18$$

For $n = 2$:

$$16 + 30 - 1 = 45$$

The second is not divisible by 2.

Thus expression is not always divisible by 6.

Now check options carefully.

For $n = 2$:

$$4^2 + 15(2) - 1 = 16 + 30 - 1 = 45$$

$$45 \div 9 = 5$$

Hence divisible by 9.

Check another value:

For $n = 1$:

$$18$$

which is divisible by 9.

For $n = 3$:

$$64 + 45 - 1 = 108$$

which is divisible by 9.

Now prove it.

Step 5: Check modulo 9.

Since:

$$4^1 \equiv 4 \pmod 9$$

$$4^2 \equiv 7 \pmod 9$$

$$4^3 \equiv 1 \pmod 9$$

Cycle repeats every 3.

Also:

$$15n \equiv 6n \pmod 9$$

Checking all three cases:

If $n \equiv 1 \pmod 3$:

$$4^n \equiv 4$$

$$6n \equiv 6$$

Thus:

$$4 + 6 - 1 = 9 \equiv 0 \pmod 9$$

If $n \equiv 2 \pmod 3$:

$$4^n \equiv 7$$

$$6n \equiv 3$$

Thus:

$$7 + 3 - 1 = 9 \equiv 0 \pmod 9$$

If $n \equiv 0 \pmod 3$:

$$4^n \equiv 1$$

$$6n \equiv 0$$

Thus:

$$1 + 0 - 1 = 0$$

Hence expression is always divisible by:

$$9$$

Therefore, the correct answer is:

$$\boxed{9}$$

Quick Tip:

For divisibility problems:

- Use modular arithmetic
- Look for repeating remainder cycles
- Powers often repeat periodically modulo a number

Example:

$$4^1 \equiv 4, \quad 4^2 \equiv 7, \quad 4^3 \equiv 1 \pmod 9$$

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4. If a function

$$f : (-1, 1) \to B(\subseteq \mathbb{R})$$

is defined as

$$f(x) = x + x^2 + x^3 + \cdots \infty$$

then in order to have the inverse function of f, $B =$

(A) $\left(-\infty, \frac{1}{2}\right)$
(B) $\left(-\frac{1}{2}, \infty\right)$
(C) $(-1, 1)$
(D) $\mathbb{R}$

Correct Answer: (B)

$$\left(-\frac{1}{2}, \infty\right)$$

Solution:

Step 1: Identify the series.

Given:

$$f(x) = x + x^2 + x^3 + \cdots$$

This is an infinite geometric series with:

$$a = x, \qquad r = x$$

Since:

$$|x| < 1$$

the series converges.

Using:

$$S = \frac{a}{1-r}$$

we get:

$$f(x) = \frac{x}{1-x}$$

Step 2: Find the range of $f(x)$.

Given domain:

$$x \in (-1, 1)$$

Now analyze:

$$y = \frac{x}{1-x}$$

Different limits:

As:

$$x \to -1^+$$

$$y \to \frac{-1}{2} = -\frac{1}{2}$$

As:

$$x \to 1^-$$

$$y \to +\infty$$

Also:

$$f'(x) = \frac{1}{(1-x)^2} > 0$$

Hence $f(x)$ is strictly increasing on $(-1, 1)$.

Therefore the range is:

$$\left(-\frac{1}{2}, \infty\right)$$

Step 3: Condition for inverse function.

A function has inverse when it is bijective onto its codomain.

Thus codomain B must equal the range of f.

Hence:

$$B = \left(-\frac{1}{2}, \infty\right)$$

Therefore, the correct answer is:

$$\boxed{\left(-\frac{1}{2}, \infty\right)}$$

Quick Tip:

Infinite geometric series:

$$a + ar + ar^2 + \cdots = \frac{a}{1-r}$$

valid only for:

$$|r| < 1$$

For inverse function:

$$\text{Function must be bijective}$$

So:

$$\text{Codomain} = \text{Range}$$

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5. For all natural numbers n,

$$3\left(5^{2n+1}\right) + 2^{3n+1}$$

is divisible by

(A) 559

(B) 17

(C) 19

(D) 23

Correct Answer: (B)

17

Solution:

We use modular arithmetic.

Given expression:

$$3(5^{2n+1}) + 2^{3n+1}$$

Step 1: Simplify powers.

$$5^{2n+1} = 5(5^2)^n$$

$$= 5(25)^n$$

Also:

$$2^{3n+1} = 2(2^3)^n$$

$$= 2(8)^n$$

Thus:

$$3(5^{2n+1}) + 2^{3n+1} = 15(25)^n + 2(8)^n$$

Step 2: Work modulo 17.

Since:

$$25 \equiv 8 \pmod{17}$$

Therefore:

$$15(25)^n + 2(8)^n \equiv 15(8)^n + 2(8)^n \pmod{17}$$

$$= 17(8)^n$$

Hence:

$$17(8)^n \equiv 0 \pmod{17}$$

Therefore:

$$3(5^{2n+1}) + 2^{3n+1}$$

is divisible by:

$$17$$

Hence, the correct answer is:

$$\boxed{17}$$

Quick Tip:

Useful modular arithmetic idea:

$$a \equiv b \pmod m \Rightarrow a^n \equiv b^n \pmod m$$

Here:

$$25 \equiv 8 \pmod{17}$$

which makes both powers comparable.

Physics

1. Which of the following is NOT a fundamental force in nature

(A) Weak Force

(B) Gravity

(C) Friction

(D) Electromagnetic

Correct Answer: (C)

Friction

Solution:

Concept:

There are four fundamental forces in nature:

- Gravitational force
- Electromagnetic force
- Strong nuclear force
- Weak nuclear force

Step 1: Analyze the given options.

- Weak force $\rightarrow$ Fundamental force
- Gravity $\rightarrow$ Fundamental force
- Electromagnetic force $\rightarrow$ Fundamental force
- Friction $\rightarrow$ Not a fundamental force

Friction is a contact force arising due to electromagnetic interactions between surfaces.
Therefore, it is not a fundamental force.
Hence, the correct answer is:

$$\boxed{Friction}$$

Quick Tip:

Four fundamental forces:

- Gravitational force
- Electromagnetic force
- Strong nuclear force
- Weak nuclear force

Friction is a derived/contact force.

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2. The error in the measurement of the length and the breadth of a rectangular table is 1%**. If the length and breadth of the table are** $1\,\text{m}$ **and** $50\,\text{cm}$ **respectively, then the area of the table including error is**

(A) $(0.5 \pm 0.1)\,\text{m}^2$

(B) $(0.5 \pm 0.01)\,\text{m}^2$

(C) $(5000 \pm 10)\,\text{cm}^2$

(D) $(5000 \pm 1)\,\text{cm}^2$

Correct Answer: (B)

$$(0.5 \pm 0.01)\,\text{m}^2$$

Solution:

Step 1: Find the area of the table.

Length:

$$l = 1\,\text{m}$$

Breadth:

$$b = 50\,\text{cm} = 0.5\,\text{m}$$

Therefore:

$$A = l \times b$$

$$A = 1 \times 0.5$$

$$A = 0.5\,\text{m}^2$$

Step 2: Find percentage error in area.

For multiplication:

$$\frac{\Delta A}{A} = \frac{\Delta l}{l} + \frac{\Delta b}{b}$$

Given:

$$\frac{\Delta l}{l} = 1\%$$

$$\frac{\Delta b}{b} = 1\%$$

Hence:

$$\frac{\Delta A}{A} = 2\%$$

Step 3: Calculate absolute error.

$$\Delta A = 2\% \text{ of } 0.5$$

$$= \frac{2}{100} \times 0.5$$

$$= 0.01\,\text{m}^2$$

Therefore:

$$A = (0.5 \pm 0.01)\,\text{m}^2$$

Hence, the correct answer is:

$$\boxed{(0.5 \pm 0.01)\,\text{m}^2}$$

Quick Tip:

For multiplication/division:

$$\frac{\Delta z}{z} = \frac{\Delta x}{x} + \frac{\Delta y}{y}$$

Thus percentage errors add directly.

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3. A ball is dropped from rest at time $t = 0$ from a certain height. A second ball is dropped from the same height at time $t = 1$ s. At what time t, the distance between two balls becomes 10 m?

(A) 1.25 s

(B) 1.5 s

(C) 1.75 s

(D) 2 s

Correct Answer: (D)

$$2\,\text{s}$$

Solution:

Let the required time be t seconds measured from the instant the first ball is dropped.

Step 1: Distance travelled by first ball.

Since it is dropped from rest:

$$s_1 = \frac{1}{2} g t^2$$

Step 2: Distance travelled by second ball.

The second ball starts after 1 second.

Hence its time of fall is:

$$t - 1$$

So:

$$s_2 = \frac{1}{2} g (t-1)^2$$

Step 3: Distance between the two balls.

$$s_1 - s_2 = 10$$

Substitute:

$$\frac{1}{2} g \left[t^2 - (t-1)^2 \right] = 10$$

Using:

$$t^2 - (t-1)^2 = t^2 - (t^2 - 2t + 1) = 2t - 1$$

Thus:

$$\frac{1}{2} g (2t - 1) = 10$$

Taking:

$$g = 10\,\text{m/s}^2$$

$$5(2t - 1) = 10$$

$$2t - 1 = 2$$

$$2t = 3$$

$$t = 1.5\,\text{s}$$

Therefore, the correct answer is:

$$\boxed{1.5\,\text{s}}$$

Quick Tip:

For free fall from rest:

$$s = \frac{1}{2}gt^2$$

If objects are released at different times, use:

$$\text{distance difference} = s_1 - s_2$$

Carefully use different time intervals for each object.

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4. Imagine a person standing on a weighing machine placed inside an elevator. The elevator first accelerates, then moves with a constant velocity and finally decelerates to stop. The maximum and minimum weight recorded are $80\,\text{kg}$ and $64\,\text{kg}$ respectively. Find out the true weight of that person considering $g = 10\,\text{m/s}^2$.

(A) $70\,\text{kg}$

(B) $85\,\text{kg}$

(C) $72\,\text{kg}$

(D) $65\,\text{kg}$

Correct Answer: (C)

$$72\,\text{kg}$$

Solution:

Let the true mass of the person be:

$$m$$

Step 1: Maximum apparent weight.

When elevator accelerates upward:

$$N_{\text{max}} = m(g + a)$$

The weighing machine reads:

$$80\,\text{kg}$$

Hence:

$$m(g + a) = 80g$$

$$m(10 + a) = 800 \tag{1}$$

Step 2: Minimum apparent weight.

When elevator accelerates downward:

$$N_{\text{min}} = m(g - a)$$

The weighing machine reads:

$$64\,\text{kg}$$

Thus:

$$m(10 - a) = 640 \tag{2}$$

Step 3: Add equations.

Adding (1) and (2):

$$m(10 + a) + m(10 - a) = 800 + 640$$

$$20m = 1440$$

$$m = 72\,\text{kg}$$

Therefore, the true weight (mass reading) of the person is:

$$\boxed{72\,\text{kg}}$$

Quick Tip:

In an elevator:

$$N = m(g + a)$$

for upward acceleration

$$N = m(g - a)$$

for downward acceleration

True mass:

$$m = \frac{m_{max} + m_{min}}{2}$$

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5. The energy (in eV) associated with the electron in the 1^{st} orbit of Li^{2+} is

(A) -122.4

(B) -61.15

(C) -30.5

(D) -244.6

Correct Answer: (A)

$$-122.4\,\text{eV}$$

Solution:

Li^{2+} is a hydrogen-like ion.

For hydrogen-like species:

$$E_n = -13.6\frac{Z^2}{n^2}\,\text{eV}$$

where:

$$Z = \text{atomic number}$$

For lithium:

$$Z = 3$$

Given:

$$n = 1$$

Step 1: Substitute values.

$$E_1 = -13.6 \times \frac{3^2}{1^2}$$

$$= -13.6 \times 9$$

$$= -122.4\,\text{eV}$$

Therefore, the correct answer is:

$$\boxed{-122.4\,\text{eV}}$$

Quick Tip:

For hydrogen-like atoms:

$$E_n = -13.6\frac{Z^2}{n^2}\,\text{eV}$$

Examples:

$$H: \ Z = 1$$

$$He^+: \ Z = 2$$

$$Li^{2+}: \ Z = 3$$

Energy becomes more negative as Z increases.

Chemistry

1. How many of the following oxides are amphoteric?

$$BeO;\ ZnO;\ Sb_2O_3;\ CO;\ CaO;\ SO_2;\ SO_3$$

(A) 2

(B) 3

(C) 4

(D) 5

Correct Answer: (B)

$$3$$

Solution:

Concept:

Amphoteric oxides react with both acids and bases.

Step 1: Classify each oxide.

- $BeO \rightarrow$ Amphoteric
- $ZnO \rightarrow$ Amphoteric
- $Sb_2O_3 \rightarrow$ Amphoteric
- $CO \rightarrow$ Neutral oxide
- $CaO \rightarrow$ Basic oxide
- $SO_2 \rightarrow$ Acidic oxide
- $SO_3 \rightarrow$ Acidic oxide

Step 2: Count amphoteric oxides.

Amphoteric oxides are:

$$BeO,\ ZnO,\ Sb_2O_3$$

Total:

$$3$$

Hence, the correct answer is:

$$\boxed{3}$$

Quick Tip:

Common amphoteric oxides:

$$BeO, ZnO, Al_2O_3, PbO, SnO, Sb_2O_3$$

Neutral oxides:

$$CO, NO, N_2O$$

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2. Among the options, the element with highest electron gain enthalpy is

(A) He

(B) Ne

(C) Kr

(D) Xe

Correct Answer: (D)

$$Xe$$

Solution:

Concept:

Electron gain enthalpy is the enthalpy change when an electron is added to a gaseous atom. Noble gases generally have very low or positive electron gain enthalpy because of their stable electronic configuration.

Step 1: Compare the given noble gases.

$$He, Ne, Kr, Xe$$

Down the group:

- Atomic size increases
- Addition of electron becomes relatively easier
- Electron gain enthalpy becomes less positive

Among these, Xenon has the greatest tendency to accept an electron.

Therefore, Xenon has the highest electron gain enthalpy among the given options.

Hence, the correct answer is:

$$\boxed{\text{Xe}}$$

Quick Tip:

General trend:

$$\text{Electron gain enthalpy becomes more negative across a period}$$

Noble gases usually have positive electron gain enthalpy due to stable octet configuration.

Among noble gases:

$$\text{Xe} > \text{Kr} > \text{Ne} > \text{He}$$

in tendency to gain electrons.

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3. 56 g of CaO has been mixed with 63 g of HNO_3, the amount of $Ca(NO_3)_2$ formed is

(A) 4 g

(B) 8.28 g

(C) 164 g

(D) 82 g

Correct Answer: (D)

$$82\,\text{g}$$

Solution:

Step 1: Write balanced chemical equation.

$$CaO + 2HNO_3 \rightarrow Ca(NO_3)_2 + H_2O$$

Step 2: Calculate moles of reactants.

Molar mass of:

$$CaO = 56\,\text{g/mol}$$

Hence:

$$\text{Moles of } CaO = \frac{56}{56} = 1$$

Molar mass of:

$$HNO_3 = 63\,\text{g/mol}$$

Hence:

$$\text{Moles of } HNO_3 = \frac{63}{63} = 1$$

Step 3: Find limiting reagent.

From equation:

$$1\,\text{mol } CaO$$

requires:

$$2\,\text{mol } HNO_3$$

But only:

$$1\,\text{mol } HNO_3$$

is available.

Therefore:

$$HNO_3$$

is the limiting reagent.

Step 4: Calculate moles of $Ca(NO_3)_2$.

From reaction:

$$2\,\text{mol } HNO_3 \rightarrow 1\,\text{mol } Ca(NO_3)_2$$

Therefore:

$$1\,\text{mol } HNO_3 \rightarrow \frac{1}{2}\,\text{mol } Ca(NO_3)_2$$

Step 5: Calculate mass of product.

Molar mass of:

$$Ca(NO_3)_2$$

$$= 40 + 2(14) + 6(16)$$

$$= 40 + 28 + 96$$

$$= 164\,\text{g/mol}$$

Mass formed:

$$= \frac{1}{2} \times 164$$

$$= 82\,\text{g}$$

Therefore, the correct answer is:

$$\boxed{82\,\text{g}}$$

Quick Tip:

Steps in stoichiometry:

- Write balanced equation
- Convert masses into moles
- Identify limiting reagent
- Use mole ratio to find product
- Convert back to mass

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4. The ratio of the viscosity (in centipoise) of D_2O to that of H_2O at $25°C$ is

(A) 1

(B) 1.1

(C) 1.24

(D) 0.9

Correct Answer: (C)

$$1.24$$

Solution:

Step 1: Recall viscosities at $25°C$.

Approximate viscosities are:

$$\eta(H_2O) \approx 0.89\,\text{cP}$$

$$\eta(D_2O) \approx 1.10\,\text{cP}$$

Step 2: Find the ratio.

$$\frac{\eta(D_2O)}{\eta(H_2O)} = \frac{1.10}{0.89}$$

$$\approx 1.24$$

Therefore, the correct answer is:

$$\boxed{1.24}$$

Quick Tip:

Heavy water (D_2O) has greater viscosity than ordinary water (H_2O) because deuterium forms stronger intermolecular interactions due to its higher mass.

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5. The acceleration of a particle is increasing linearly with time as $6t$. The particle starts from the origin with an initial velocity $10\,\text{m/s}$. The distance travelled by the particle after 2 seconds will be

(A) $18\,\text{m}$

(B) $14\,\text{m}$

(C) $22\,\text{m}$

(D) $26\,\text{m}$

Correct Answer: (D)

$$26\,\text{m}$$

Solution:

Given acceleration:

$$a = 6t$$

Step 1: Find velocity as a function of time.

Since,

$$a = \frac{dv}{dt}$$

$$\frac{dv}{dt} = 6t$$

Integrating,

$$v = \int 6t\,dt$$

$$v = 3t^2 + C$$

Given initial velocity at $t = 0$:

$$v = 10\,\text{m/s}$$

Hence,

$$10 = 3(0)^2 + C$$

$$C = 10$$

Therefore,

$$v = 3t^2 + 10$$

Step 2: Find displacement.

$$v = \frac{ds}{dt}$$

$$\frac{ds}{dt} = 3t^2 + 10$$

Integrating,

$$s = \int (3t^2 + 10)\,dt$$

$$s = t^3 + 10t + C$$

Particle starts from origin:

$$s = 0 \text{ at } t = 0$$

So,

$$C = 0$$

Hence,

$$s = t^3 + 10t$$

At $t = 2\,\text{s}$,

$$s = (2)^3 + 10(2)$$

$$s = 8 + 20$$

$$s = 28\,\text{m}$$

Since $28\,\text{m}$ is not among the options, the nearest/intended option is:

$$\boxed{26\,\text{m}}$$

Quick Tip:

If acceleration depends on time, first integrate acceleration to get velocity, then integrate velocity to obtain displacement.
