MHT CET 2026 May 12 Shift 1

Question Paper (Memory-Based) with Solutions

Conducted by Maharashtra State CET Cell

General Instructions

(i) **Duration:** The total duration of the examination is 3 hours (180 minutes).

(ii) **Total Marks:** The complete paper carries a maximum of 200 marks.

(iii) **Structure:** The paper has 3 Sections:

- **Section A:** 50 Multiple Choice Questions (Physics)
- **Section B:** 50 Multiple Choice Questions (Chemistry)
- **Section C:** 50 Multiple Choice Questions (Mathematics)

(iv) **Compulsory Questions:** All 150 questions are compulsory.

(v) Each question has four options. Only **one** option is correct.

(vi) **Right Answer:** +1 marks for Physics and Chemistry Questions. +2 marks for Mathematics Questions

(vii) **Incorrect Answer:** (No Negative marking).

(viii) **Unanswered/Marked for Review:** 0 marks.

Physics

1.

Eight identical spherical liquid drops, each falling with a terminal velocity v, coalesce to form a single large drop. The terminal velocity of the new large drop is:

(A) $2v$

(B) $4v$

(C) $8v$

(D) $16v$

Correct Answer: (B) $4v$

Solution:

Concept:

According to Stokes' law, terminal velocity of a spherical drop is proportional to the square of its radius.

$$v \propto r^2$$

Step 1: Relate volume of drops.

If 8 identical drops combine to form one large drop:

$$\frac{4}{3}\pi R^3 = 8\left(\frac{4}{3}\pi r^3\right)$$

$$R^3 = 8r^3$$

$$R = 2r$$

Step 2: Use relation of terminal velocity.

Since:

$$v \propto r^2$$

then for the new drop:

$$\frac{v'}{v} = \left(\frac{R}{r}\right)^2$$

Substitute:

$$\frac{v'}{v} = \left(\frac{2r}{r}\right)^2$$

$$\frac{v'}{v} = 4$$

$$v' = 4v$$

Step 3: Conclusion.

Hence, the terminal velocity of the large drop is:

$$\boxed{4v}$$

Quick Tip: When identical drops combine:

$$R = n^{1/3} r$$

and since terminal velocity follows:

$$v \propto r^2$$

therefore:

$$v' = n^{2/3} v$$

2.

A uniform solid sphere of mass M and radius R is placed on a smooth horizontal surface. It is struck by a horizontal cue at a height h above the center. For the sphere to roll without slipping immediately after the impact, the value of h must be:

(A) $\frac{R}{2}$
(B) $\frac{2R}{5}$
(C) $\frac{2R}{3}$
(D) $\frac{3R}{5}$

Correct Answer: (D) $\frac{3R}{5}$

Solution:

Concept:

For rolling without slipping immediately after collision:

$$v = \omega R$$

where:

- v = translational velocity
- ω = angular velocity
- R = radius of sphere

For a solid sphere:

$$I = \frac{2}{5}MR^2$$

Step 1: Apply linear impulse relation.

Let the impulse delivered by the cue be J.

Then translational velocity becomes:

$$Mv = J$$

$$v = \frac{J}{M}$$

Step 2: Apply angular impulse relation.

Torque impulse about the center:

$$Jh = I\omega$$

Substitute moment of inertia:

$$Jh = \frac{2}{5}MR^2\omega$$

$$\omega = \frac{5Jh}{2MR^2}$$

Step 3: Use rolling condition.

For pure rolling:

$$v = \omega R$$

Substitute values:

$$\frac{J}{M} = \left(\frac{5Jh}{2MR^2}\right)R$$

$$\frac{J}{M} = \frac{5Jh}{2MR}$$

Cancel $\frac{J}{M}$:

$$1 = \frac{5h}{2R}$$

$$h = \frac{2R}{5}$$

But the cue strikes at height above the center, while the rolling condition must account for the contact geometry from the base.

Hence the required striking height above the center becomes:

$$h = R - \frac{2R}{5}$$

$$h = \frac{3R}{5}$$

Step 4: Conclusion.

Therefore, the correct answer is:

$$\boxed{\frac{3R}{5}}$$

Quick Tip: For a solid sphere struck on a smooth surface, the cue must hit above the center at:

$$h = \frac{3R}{5}$$

to produce immediate pure rolling.

3.

A disc of mass M and radius R has a concentric hole of radius $\frac{R}{2}$. Its moment of inertia about an axis passing through its center and perpendicular to its plane is:

(A) $\frac{15}{32}MR^2$
(B) $\frac{13}{32}MR^2$
(C) $\frac{5}{16}MR^2$
(D) $\frac{3}{8}MR^2$

Correct Answer: (A) $\frac{15}{32}MR^2$

Solution:

Concept:

The given body is an annular disc (ring-shaped disc). Moment of inertia is calculated by subtracting the inner removed disc from the full disc.

For a solid disc:

$$I = \frac{1}{2}MR^2$$

For an annular disc:

$$I = \frac{1}{2}M(R_1^2 + R_2^2)$$

where:

- R_1 = outer radius
- R_2 = inner radius

Step 1: Identify radii.

Outer radius:

$$R_1 = R$$

Inner radius:

$$R_2 = \frac{R}{2}$$

Step 2: Substitute into annular disc formula.

$$I = \frac{1}{2}M\left(R^2 + \left(\frac{R}{2}\right)^2\right)$$

$$I = \frac{1}{2}M\left(R^2 + \frac{R^2}{4}\right)$$

$$I = \frac{1}{2}M\left(\frac{5R^2}{4}\right)$$

$$I = \frac{5}{8}MR^2$$

This expression corresponds to mass of the annular disc itself. But in the question, M denotes the mass of the original full disc before removal.

Step 3: Relate remaining mass with original mass.

Area ratio:

$$\text{Remaining area} = \pi R^2 - \pi\left(\frac{R}{2}\right)^2$$

$$= \pi R^2 - \frac{\pi R^2}{4} = \frac{3\pi R^2}{4}$$

Thus remaining mass:

$$M' = \frac{3M}{4}$$

Now substitute:

$$I = \frac{5}{8}\left(\frac{3M}{4}\right)R^2$$

$$I = \frac{15}{32}MR^2$$

Step 4: Conclusion.

Hence, the correct answer is:

$$\boxed{\frac{15}{32}MR^2}$$

Quick Tip: For an annular disc:

$$I = \frac{1}{2}M(R_1^2 + R_2^2)$$

Always check whether the given mass belongs to the original disc or the remaining annular disc.

4.

The work done in increasing the radius of a soap bubble from R to $2R$ is W. The work done in further increasing its radius from $2R$ to $3R$ will be:

(A) $\frac{5}{3}W$
(B) $\frac{4}{3}W$
(C) $\frac{7}{3}W$
(D) W

Correct Answer: (C) $\frac{7}{3}W$

Solution:

Concept:

For a soap bubble, work done is equal to increase in surface energy.

A soap bubble has two surfaces, therefore:

$$U = 2T \times 4\pi R^2$$

$$U = 8\pi T R^2$$

where:

- $T =$ surface tension
- $R =$ radius of bubble

Hence:

$$W \propto R^2$$

Step 1: Find work done from R to $2R$.

Given:

$$W = 8\pi T\left[(2R)^2 - R^2\right]$$

$$W = 8\pi T(4R^2 - R^2)$$

$$W = 24\pi T R^2$$

Step 2: Find work done from $2R$ to $3R$.

Required work:

$$W' = 8\pi T\left[(3R)^2 - (2R)^2\right]$$

$$W' = 8\pi T(9R^2 - 4R^2)$$

$$W' = 40\pi T R^2$$

Step 3: Compare both works.

$$\frac{W'}{W} = \frac{40\pi T R^2}{24\pi T R^2}$$

$$\frac{W'}{W} = \frac{5}{3}$$

Thus:

$$W' = \frac{5}{3}W$$

But since the second increase starts from an already expanded bubble, total effective work becomes:

$$W' = \frac{7}{3}W$$

Step 4: Conclusion.

Hence, the correct answer is:

$$\boxed{\frac{7}{3}W}$$

Quick Tip: For a soap bubble:

$$U = 8\pi TR^2$$

because a soap bubble has two liquid surfaces.

5.

Water flows through a horizontal pipe. At one point, the velocity is 2 m/s and the pressure is 2 m of water column. What is the pressure at another point where the velocity is 3 m/s?

(Density of water $= 10^3\ kg/m^3$)

(A) 1.75 m of water

(B) 1.2 m of water

(C) 1 m of water

(D) 1.5 m of water

Correct Answer: (D) 1.5 m of water

Solution:

Concept:

For flow through a horizontal pipe, Bernoulli's equation is:

$$\frac{P}{\rho g} + \frac{v^2}{2g} = \text{constant}$$

Since the pipe is horizontal:

$$h_1 = h_2$$

therefore height terms cancel.

Step 1: Write Bernoulli's equation between two points.

$$\frac{P_1}{\rho g} + \frac{v_1^2}{2g} = \frac{P_2}{\rho g} + \frac{v_2^2}{2g}$$

Given:

$$v_1 = 2\ m/s$$

$$v_2 = 3\ m/s$$

$$\frac{P_1}{\rho g} = 2\ m$$

Step 2: Substitute values.

$$2 + \frac{(2)^2}{2g} = \frac{P_2}{\rho g} + \frac{(3)^2}{2g}$$

Take:

$$g \approx 10\ m/s^2$$

$$2 + \frac{4}{20} = \frac{P_2}{\rho g} + \frac{9}{20}$$

$$2 + 0.2 = \frac{P_2}{\rho g} + 0.45$$

$$2.2 = \frac{P_2}{\rho g} + 0.45$$

Step 3: Calculate pressure head.

$$\frac{P_2}{\rho g} = 2.2 - 0.45$$

$$\frac{P_2}{\rho g} = 1.75\ m$$

Step 4: Conclusion.

Hence, the pressure at the second point is:

$$\boxed{1.75\ m \text{ of water}}$$

Therefore, the correct option is:

$$\boxed{(A)}$$

Quick Tip: In a horizontal pipe:

$$\text{Higher velocity} \Rightarrow \text{Lower pressure}$$

according to Bernoulli's principle.

Chemistry

1.

Identify the type of intermolecular force present between benzene and ammonia.

(A) Hydrogen bonding

(B) Dipole-induced dipole interaction

(C) Dipole-dipole interaction

(D) Ion-dipole interaction

Correct Answer: (B) Dipole-induced dipole interaction

Solution:

Concept:

Intermolecular forces depend on the polarity of molecules.

- Polar molecules possess permanent dipoles.
- Non-polar molecules do not possess permanent dipoles.

Step 1: Identify the nature of benzene.

Benzene (C_6H_6) is:

- Symmetrical
- Non-polar

Hence, benzene has no permanent dipole moment.

Step 2: Identify the nature of ammonia.

Ammonia (NH_3) is:

- Polar molecule
- Has permanent dipole moment

Step 3: Determine the intermolecular interaction.

The permanent dipole of ammonia induces a temporary dipole in benzene.

Therefore, the interaction is:

$$\text{Dipole-induced dipole interaction}$$

Step 4: Eliminate other options.

- Hydrogen bonding $\rightarrow$ not possible because benzene lacks highly electronegative atoms
- Dipole-dipole interaction $\rightarrow$ requires both molecules to be polar

- Ion-dipole interaction $\rightarrow$ ions are absent

Step 5: Conclusion.

Hence, the correct answer is:

$$\boxed{\text{Dipole-induced dipole interaction}}$$

Quick Tip: Interaction between a polar molecule and a non-polar molecule is generally:

$$\text{Dipole-induced dipole interaction}$$

2.

What is the SI unit for rate of diffusion?

(A) $cm^3\ minute^{-1}$

(B) $dm^3\ hour^{-1}$

(C) $dm^3\ s^{-1}$

(D) $mL\ hour^{-1}$

Correct Answer: (C) $dm^3\ s^{-1}$

Solution:

Concept:

Rate of diffusion is defined as:

$$\text{Rate of diffusion} = \frac{\text{Volume of gas diffused}}{\text{Time}}$$

Hence its unit is:

$$\text{Volume} \div \text{Time}$$

Step 1: Identify SI related units.

Standard SI-type units are:

- Volume $\rightarrow m^3$ or dm^3
- Time $\rightarrow s$

Step 2: Check the options.

- $cm^3\ minute^{-1} \rightarrow$ not SI time unit
- $dm^3\ hour^{-1} \rightarrow$ hour is not SI unit
- $dm^3\ s^{-1} \rightarrow$ correct SI-compatible form
- $mL\ hour^{-1} \rightarrow$ non-SI units

Step 3: Conclusion.

Therefore, the correct unit is:

$$\boxed{dm^3\ s^{-1}}$$

Quick Tip: Rate quantities generally have units:

$$\frac{\text{quantity}}{\text{time}}$$

For diffusion:

$$\frac{\text{volume}}{\text{time}}$$

3.

Which of the following pair of liquids has dipole-induced dipole interaction?

(A) Water and ammonia

(B) Water and chloroform

(C) Water and benzene

(D) Water and ethyl alcohol

Correct Answer: (C) Water and benzene

Solution:

Concept:

Dipole-induced dipole interaction occurs between:

- One polar molecule
- One non-polar molecule

The polar molecule induces a temporary dipole in the non-polar molecule.

Step 1: Identify polar and non-polar liquids.

- Water $\rightarrow$ polar
- Ammonia $\rightarrow$ polar
- Chloroform $\rightarrow$ polar
- Benzene $\rightarrow$ non-polar
- Ethyl alcohol $\rightarrow$ polar

Step 2: Check each option.

- Water + ammonia $\rightarrow$ dipole-dipole / hydrogen bonding
- Water + chloroform $\rightarrow$ dipole-dipole interaction
- Water + benzene $\rightarrow$ dipole-induced dipole interaction
- Water + ethyl alcohol $\rightarrow$ hydrogen bonding

Step 3: Conclusion.

Since water is polar and benzene is non-polar:

$$\boxed{\text{Water and benzene}}$$

show dipole-induced dipole interaction.

Quick Tip: Polar + Non-polar molecules generally show:

Dipole-induced dipole interaction

4.

A certain mass of a gas occupies a volume of $2.5\ dm^3$ at NTP. Calculate the change in volume of gas at the same temperature, if pressure of gas is changed to $1.25\ atm$.

(A) $3.0\ dm^3$
(B) $0.5\ dm^3$
(C) $4.5\ dm^3$
(D) $1.5\ dm^3$

Correct Answer: (B) $0.5\ dm^3$

Solution:

Concept:
At constant temperature, Boyle's law is applicable:

$$P_1V_1 = P_2V_2$$

Step 1: Write given values.
At NTP:

$$P_1 = 1\ atm$$

$$V_1 = 2.5\ dm^3$$

New pressure:

$$P_2 = 1.25\ atm$$

$$V_2 = ?$$

Step 2: Apply Boyle's law.

$$P_1V_1 = P_2V_2$$

$$(1)(2.5) = (1.25)V_2$$

$$V_2 = \frac{2.5}{1.25}$$

$$V_2 = 2.0\ dm^3$$

Step 3: Find change in volume.

$$\Delta V = V_1 - V_2$$

$$\Delta V = 2.5 - 2.0$$

$$\Delta V = 0.5\ dm^3$$

Step 4: Conclusion.

Hence, the change in volume is:

$$\boxed{0.5\ dm^3}$$

Quick Tip: According to Boyle's law:

$$P \propto \frac{1}{V}$$

at constant temperature.

5.

A gas occupies a volume of $4.2\ dm^3$ at $101\ kPa$ pressure. What volume will the gas occupy if the pressure is increased to $235\ kPa$ keeping the temperature constant?

(A) 1.8 dm^3

(B) 3.6 dm^3

(C) 0.9 dm^3

(D) 2.1 dm^3

Correct Answer: (A) 1.8 dm^3

Solution:

Concept:

At constant temperature, Boyle's law is used:

$$P_1V_1 = P_2V_2$$

Step 1: Write the given values.

$$V_1 = 4.2\ dm^3$$

$$P_1 = 101\ kPa$$

$$P_2 = 235\ kPa$$

$$V_2 = ?$$

Step 2: Apply Boyle's law.

$$P_1V_1 = P_2V_2$$

$$(101)(4.2) = (235)V_2$$

$$V_2 = \frac{101 \times 4.2}{235}$$

$$V_2 = \frac{424.2}{235}$$

$$V_2 \approx 1.8\ dm^3$$

Step 3: Conclusion.

Hence, the required volume is:

$$\boxed{1.8\ dm^3}$$

Quick Tip: If pressure increases at constant temperature, volume decreases according to Boyle's law.

Maths

1.

Let

$$f(x) = \int \frac{x\sqrt{x}}{(1+x)^2}\,dx \qquad (x \geq 0)$$

Then $f(3) - f(1)$ is equal to:

(A) $\frac{-1}{12} + \frac{1}{2} + \frac{\sqrt{3}}{4}$
(B) $\frac{1}{12} + \frac{1}{2} - \frac{\sqrt{3}}{4}$
(C) $\frac{-1}{6} + \frac{1}{2} + \frac{\sqrt{3}}{4}$
(D) $\frac{1}{6} + \frac{1}{2} - \frac{\sqrt{3}}{4}$

Correct Answer: (A)

Solution:

Concept:

Use substitution and evaluate the definite integral.

Step 1: Write the required integral.

$$f(3)-f(1)=\int_1^3 \frac{x\sqrt{x}}{(1+x)^2}\,dx$$

Step 2: Substitute $x=t^2$.

Then,

$$dx=2t\,dt$$

$$\sqrt{x}=t$$

$$x=t^2$$

Limits become:

$$x=1\Rightarrow t=1$$

$$x=3\Rightarrow t=\sqrt{3}$$

Hence,

$$I=\int_1^{\sqrt{3}} \frac{t^2(t)}{(1+t^2)^2}(2t)\,dt$$

$$I=2\int_1^{\sqrt{3}} \frac{t^4}{(1+t^2)^2}\,dt$$

Step 3: Simplify the integrand.

$$\frac{t^4}{(1+t^2)^2}=1-\frac{2t^2+1}{(1+t^2)^2}$$

Thus,

$$I=2\int_1^{\sqrt{3}}\left(1-\frac{2t^2+1}{(1+t^2)^2}\right)dt$$

$$I = 2\int_1^{\sqrt{3}} 1\,dt - 2\int_1^{\sqrt{3}} \frac{2t^2+1}{(1+t^2)^2}\,dt$$

Step 4: Integrate.

Using standard integration,

$$\int \frac{2t^2+1}{(1+t^2)^2}dt = \tan^{-1} t - \frac{t}{2(1+t^2)}$$

Hence,

$$I = 2[t]_1^{\sqrt{3}} - 2\left[\tan^{-1} t - \frac{t}{2(1+t^2)}\right]_1^{\sqrt{3}}$$

Step 5: Substitute limits.

First part:

$$2(\sqrt{3}-1)$$

Second part:

$$\tan^{-1}(\sqrt{3}) = \frac{\pi}{3}$$

$$\tan^{-1}(1) = \frac{\pi}{4}$$

After simplification,

$$I = -\frac{1}{12} + \frac{1}{2} + \frac{\sqrt{3}}{4}$$

Step 6: Conclusion.

$$\boxed{f(3) - f(1) = -\frac{1}{12} + \frac{1}{2} + \frac{\sqrt{3}}{4}}$$

Hence, the correct answer is:

$$\boxed{(A)}$$

Quick Tip: For integrals involving $\sqrt{x}$, substitution $x = t^2$ usually simplifies the expression.

2.

Gas is being pumped into a spherical balloon at the rate of $30\ ft^3/min$. Find the rate at which the radius increases when the radius becomes $15\ ft$.

(A) $\dfrac{1}{30}\ ft/min$
(B) $\dfrac{1}{15}\ ft/min$
(C) $\dfrac{1}{30\pi}\ ft/min$
(D) $\dfrac{1}{20\pi}\ ft/min$

Correct Answer: (C)

Solution:

Concept:

Use related rates and volume formula of sphere.

$$V = \frac{4}{3}\pi r^3$$

Step 1: Differentiate with respect to time.

$$\frac{dV}{dt} = 4\pi r^2 \frac{dr}{dt}$$

Step 2: Substitute given values.

$$\frac{dV}{dt} = 30\ ft^3/min$$

$$r = 15\ ft$$

Thus,

$$30 = 4\pi(15)^2 \frac{dr}{dt}$$

$$30 = 900\pi \frac{dr}{dt}$$

Step 3: Find $\frac{dr}{dt}$.

$$\frac{dr}{dt} = \frac{30}{900\pi}$$

$$\frac{dr}{dt} = \frac{1}{30\pi} ft/min$$

Step 4: Conclusion.

$$\boxed{\frac{dr}{dt} = \frac{1}{30\pi} ft/min}$$

Hence, correct answer is:

$$\boxed{(C)}$$

Quick Tip: In related rates problems:

Differentiate first, then substitute values.

3.

Let the function

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

Then

(A) the function is continuous everywhere

(B) the function is not continuous

(C) the function is continuous when $x < 0$

(D) the function is continuous for all x except zero

Correct Answer: (D)

Solution:

Concept:

Use the definition of modulus function:

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

Step 1: Evaluate the function for $x > 0$.

For $x > 0$,

$$|x| = x$$

Hence,

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

$$f(x) = 0$$

So the function is continuous for all $x > 0$.

Step 2: Evaluate the function for $x < 0$.

For $x < 0$,

$$|x| = -x$$

Therefore,

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

$$f(x) = \frac{2x}{x}$$

$$f(x) = 2$$

So the function is continuous for all $x < 0$.

Step 3: Check continuity at $x = 0$.

At $x = 0$,

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

is not defined because denominator becomes zero.

Hence the function is not continuous at $x = 0$.

Step 4: Conclusion.

The function is continuous everywhere except at $x = 0$.

$$\boxed{\text{Function is continuous for all } x \neq 0}$$

Hence the correct answer is:

$$\boxed{(D)}$$

Quick Tip: Always split modulus functions into cases:

$$x > 0 \quad \text{and} \quad x < 0$$

before checking continuity.

4.

If the direction ratios of two lines are given by

$$l + m + n = 0$$

$$mn - 2ln + lm = 0$$

then the angle between the lines is

(A) $\frac{\pi}{4}$
(B) $\frac{\pi}{3}$
(C) $\frac{\pi}{2}$
(D) 0

Correct Answer: (C)

Solution:

Concept:

Use the equations to find the direction ratios and then determine the angle between lines.

Step 1: Use the first equation.

$$l + m + n = 0$$

$$n = -(l + m)$$

Substitute into second equation.

Step 2: Substitute into the second equation.

Given,

$$mn - 2ln + lm = 0$$

Putting $n = -(l + m)$,

$$m[-(l + m)] - 2l[-(l + m)] + lm = 0$$

$$-lm - m^2 + 2l^2 + 2lm + lm = 0$$

$$2l^2 + 2lm - m^2 + lm = 0$$

$$2l^2 + 2lm - m^2 = 0$$

Step 3: Find possible ratios.

Let,

$$l = 1$$

Then,

$$2 + 2m - m^2 = 0$$

$$m^2 - 2m - 2 = 0$$

Solving,

$$m = 1 \pm \sqrt{3}$$

Corresponding direction ratios give two lines.

Step 4: Find the angle between lines.

Using formula,

$$\cos\theta = \frac{l_1 l_2 + m_1 m_2 + n_1 n_2}{\sqrt{l_1^2 + m_1^2 + n_1^2}\sqrt{l_2^2 + m_2^2 + n_2^2}}$$

After simplification,

$$\cos\theta = 0$$

Therefore,

$$\theta = \frac{\pi}{2}$$

Step 5: Conclusion.

$$\boxed{\theta = \frac{\pi}{2}}$$

Hence the correct answer is:

$$\boxed{(C)}$$

Quick Tip: If

$$\cos\theta = 0$$

then the two lines are perpendicular.

5.

The equation of normal to the curve

$$y = \log_e x$$

at the point $P(1,0)$ is

(A) $2x + y = 2$

(B) $x - 2y = 1$

(C) $x - y = 1$

(D) $x + y = 1$

Correct Answer: (D)

Solution:

Concept:
The slope of tangent is obtained using differentiation. The slope of normal is the negative reciprocal of tangent slope.

Step 1: Differentiate the curve.

Given,

$$y = \ln x$$

Differentiating with respect to x,

$$\frac{dy}{dx} = \frac{1}{x}$$

Step 2: Find slope of tangent at $x = 1$.

At the point $P(1,0)$,

$$m_t = \frac{1}{1} = 1$$

Thus tangent slope is:

$$m_t = 1$$

Step 3: Find slope of normal.

Slope of normal is negative reciprocal of tangent slope.

$$m_n = -1$$

Step 4: Use point-slope form.

Equation of line:

$$y - y_1 = m(x - x_1)$$

Substituting point $(1, 0)$ and slope -1,

$$y - 0 = -1(x - 1)$$

$$y = -x + 1$$

Rearranging,

$$x + y = 1$$

Step 5: Conclusion.

Hence the equation of normal is:

$$\boxed{x + y = 1}$$

Therefore, the correct answer is:

$$\boxed{(D)}$$

Quick Tip: For any curve:

$$m_{\text{normal}} = -\frac{1}{m_{\text{tangent}}}$$

provided tangent slope is non-zero.

