AME CET Physics

Sample Paper – 11

Duration: 20 Minutes **Maximum Marks: 80**

Instructions

- This paper contains **20** Multiple Choice Questions (Single Correct Answer), modelled on the Physics section of **AME CET** entrance.
- Each correct answer carries **+4 marks**. Each wrong answer carries -1 **mark**. Unattempted questions carry **0 marks**.
- Only **one** option is correct per question. Choose carefully.
- Syllabus level: **Class 11 and 12 NCERT Physics** (Units & Measurement to Communication Systems).
- Use of mobile phones, calculators, or any electronic gadget is strictly prohibited.

Q1. A wire of length $L = 2\,\text{m}$ and uniform cross-sectional area $A = 4 \times 10^{-8}\,\text{m}^2$ is made of a material of resistivity $\rho = 1.6 \times 10^{-8}\,\Omega\text{·m}$. Using $R = \rho L/A$, what is the resistance of the wire?

(A) $0.2\,\Omega$

(B) $3.2\,\Omega$

(C) $1.6\,\Omega$

(D) $0.8\,\Omega$

Q2. A galvanometer of resistance $G = 99\,\Omega$ gives full-scale deflection for a current $I_g = 5\,\text{mA}$. To convert it into an ammeter reading up to $I = 5\,\text{A}$, what shunt resistance S must be connected in parallel?

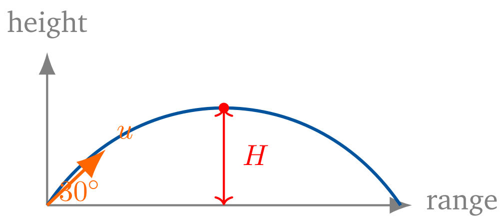
(A) $0.099\,\Omega$

(B) $0.99\,\Omega$

(C) $9.9\,\Omega$

(D) $1.0\,\Omega$

Q3. A ball is projected from the ground with speed $u = 20\,\text{m/s}$ at an angle $\theta = 30^\circ$ above the horizontal. Taking $g = 10\,\text{m/s}^2$, what is the maximum height reached?



(A) $10\,\text{m}$

(B) $5\,\text{m}$

(C) $15\,\text{m}$

(D) $2.5\,\text{m}$

Q4. A car covers the first half of a straight road at $40\,\text{km/h}$ and the second half (equal distance) at $60\,\text{km/h}$. What is the average speed for the whole trip?

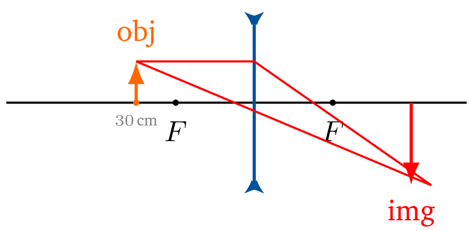
(A) $50\,\text{km/h}$

(B) $52\,\text{km/h}$

(C) $48\,\text{km/h}$

(D) $45\,\text{km/h}$

Q5. An object of height $2\,\text{cm}$ is placed $30\,\text{cm}$ in front of a convex lens of focal length $20\,\text{cm}$. Using $1/v - 1/u = 1/f$ and $m = v/u$, what is the height of the image?



(A) 2 cm

(B) 6 cm

(C) 3 cm

(D) 4 cm

Q6. An object is placed 45 cm in front of a concave mirror of focal length 15 cm (so the object lies beyond the centre of curvature). What is the magnitude of the magnification of the real image formed?

(A) 0.5

(B) 1.0

(C) 2.0

(D) 1.5

Q7. A coil of $N = 100$ turns and area $A = 0.05\,\text{m}^2$ rotates at angular speed $\omega = 100\,\text{rad/s}$ in a uniform magnetic field $B = 0.2\,\text{T}$. Using $\varepsilon_0 = NBA\omega$, what is the peak EMF generated?

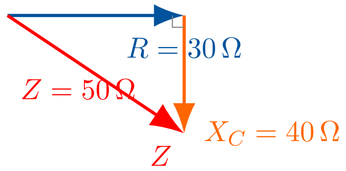
(A) 50 V

(B) 200 V

(C) 100 V

(D) 10 V

Q8. In a series RC circuit, the resistance is $R = 30\,\Omega$ and the capacitive reactance is $X_C = 40\,\Omega$. Using $Z = \sqrt{R^2 + X_C^2}$, what is the impedance of the circuit?



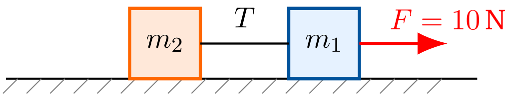
(A) $70\,\Omega$

(B) $50\,\Omega$

(C) $35\,\Omega$

(D) $10\,\Omega$

Q9. Two blocks of masses $m_1 = 2\,\text{kg}$ and $m_2 = 3\,\text{kg}$ rest on a smooth horizontal surface, connected by a light string. A horizontal force $F = 10\,\text{N}$ is applied to m_1, pulling the system away from m_2 as shown. What is the tension T in the connecting string?



(A) $10\,\text{N}$

(B) $4\,\text{N}$

(C) $2\,\text{N}$

(D) $6\,\text{N}$

Q10. A body of mass $2\,\text{kg}$ is moving at a speed of $10\,\text{m/s}$ on a frictionless surface. What is the work that must be done on it to bring it completely to rest?

(A) $-100\,\text{J}$

(B) $-200\,\text{J}$

(C) $-50\,\text{J}$

(D) $-20\,\text{J}$

Q11. A point charge $q = 2 \times 10^{-6}\,\text{C}$ produces an electric field at a distance $r = 0.3\,\text{m}$. Using $k = 9 \times 10^9\,\text{N·m}^2/\text{C}^2$ and $E = kq/r^2$, what is the magnitude of the field?

(A) $6 \times 10^4\,\text{N/C}$

(B) $2 \times 10^5\,\text{N/C}$

(C) $6 \times 10^5\,\text{N/C}$

(D) $2 \times 10^4\,\text{N/C}$

Q12. A flat circular coil of $N = 50$ turns carries a current $I = 2\,\text{A}$ and encloses an area $A = 0.01\,\text{m}^2$. Using $m = NIA$, what is the magnetic moment of the coil?

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

(B) $100\,\text{A}\cdot\text{m}^2$

(C) $2\,\text{A}\cdot\text{m}^2$

(D) $1\,\text{A}\cdot\text{m}^2$

Q13. Light of frequency $f = 1 \times 10^{15}\,\text{Hz}$ strikes a metal of work function $\phi = 2\,\text{eV}$. Using $eV_0 = hf - \phi$, with $h = 6.6 \times 10^{-34}\,\text{J·s}$ and $1\,\text{eV} = 1.6 \times 10^{-19}\,\text{J}$, what is the stopping potential V_0?

(A) $4.1\,\text{V}$

(B) $1.1\,\text{V}$

(C) $2.1\,\text{V}$

(D) $6.6\,\text{V}$

Q14. For a hydrogen atom, the energy of the electron in the nth Bohr orbit is $E_n = -13.6/n^2\,\text{eV}$. What is the energy of the electron in the second orbit $(n = 2)$?

(A) $-3.4\,\text{eV}$

(B) $-13.6\,\text{eV}$

(C) $-6.8\,\text{eV}$

(D) $-1.51\,\text{eV}$

Q15. A gas expands at a constant pressure of $P = 2 \times 10^5\,\text{Pa}$, with its volume increasing by $\Delta V = 0.01\,\text{m}^3$. Using $W = P\,\Delta V$, what is the work done by the gas?

(A) $200\,\text{J}$

(B) $2000\,\text{J}$

(C) $20000\,\text{J}$

(D) $2 \times 10^6\,\text{J}$

Q16. A simple pendulum has length $L = 1\,\text{m}$ and is taken to a place where $g = 10\,\text{m/s}^2$. Using $T = 2\pi\sqrt{L/g}$, what is the time period of the pendulum? (Take $\pi = 3.14$.)

(A) $1\,\text{s}$

(B) $6.28\,\text{s}$

(C) $3.14\,\text{s}$

(D) $2\,\text{s}$

Q17. A thin circular ring of mass $M = 2\,\text{kg}$ and radius $R = 0.5\,\text{m}$ rotates about an axis through its centre perpendicular to its plane. Using $I = MR^2$, what is its moment of inertia?

(A) $1.0\,\text{kg} \cdot \text{m}^2$

(B) $0.25\,\text{kg} \cdot \text{m}^2$

(C) $0.5\,\text{kg} \cdot \text{m}^2$

(D) $2.0\,\text{kg} \cdot \text{m}^2$

Q18. The two inputs to a NAND gate are $A = 1$ and $B = 1$. What is the output Y?

(A) 0

(B) 1

(C) $A + B$

(D) $A \cdot B$

Q19. A spherical liquid drop has radius $r = 2\,\text{mm}$ and the surface tension of the liquid is $T = 0.072\,\text{N/m}$. Using $\Delta P = 2T/r$, what is the excess pressure inside the drop?

(A) $36\,\text{Pa}$

(B) $72\,\text{Pa}$

(C) $144\,\text{Pa}$

(D) $0.072\,\text{Pa}$

Q20. The acceleration due to gravity at the surface of the Earth is $g = 10\,\text{m/s}^2$. Using $g' = g(1 - d/R)$, what is the value of g' at a depth $d = R/2$ below the surface (where R is the Earth's radius)?

(A) $10\,\text{m/s}^2$

(B) $2.5\,\text{m/s}^2$

(C) $5\,\text{m/s}^2$

(D) $0\,\text{m/s}^2$

Detailed Solutions

Q1.

Solution

Concept — Resistance from Resistivity: $R = \rho L/A$.

Step 1 — Numerator ρL:

$$\rho L = 1.6 \times 10^{-8} \times 2 = 3.2 \times 10^{-8}\,\Omega \cdot \text{m}^2$$

Step 2 — Divide by area A:

$$R = \frac{3.2 \times 10^{-8}}{4 \times 10^{-8}} = \frac{3.2}{4} = 0.8\,\Omega$$

Why other options are wrong:

- Option A (0.2 Ω): divides ρ/A but forgets to multiply by L.
- Option B (3.2 Ω): uses $A = 4 \times 10^{-9}$ m^2 (wrong power).
- Option C (1.6 Ω): forgets the factor $L = 2$ m.

Final Answer: $R = 0.8\,\Omega \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q1

Q2.

Solution

Concept — Shunt for an Ammeter: The shunt carries the excess current; $S = I_g G/(I - I_g)$.

Step 1 — Convert I_g:

$$I_g = 5\,\text{mA} = 0.005\,\text{A}$$

Step 2 — Numerator $I_g G$:

$$I_g G = 0.005 \times 99 = 0.495\,\text{V}$$

Step 3 — Denominator $I - I_g$:

$$I - I_g = 5 - 0.005 = 4.995\,\text{A}$$

Step 4 — Divide:

$$S = \frac{0.495}{4.995} \approx 0.099\,\Omega$$

Why other options are wrong:

- Option B (0.99 Ω): uses $I_g = 50$ mA.
- Option C (9.9 Ω): forgets to divide by $(I - I_g)$ correctly.
- Option D (1.0 Ω): rounds S as if $I = 0.5$ A.

Final Answer: $S \approx 0.099\,\Omega \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q2

Q3.

Solution

Concept — Projectile Maximum Height: $H = u^2 \sin^2\theta/(2g)$.

Step 1 — $\sin 30°$**:**

$$\sin 30° = 0.5 \Rightarrow \sin^2 30° = 0.25$$

Step 2 — Numerator $u^2 \sin^2\theta$**:**

$$u^2 \sin^2\theta = 20^2 \times 0.25 = 400 \times 0.25 = 100$$

Step 3 — Divide by $2g$**:**

$$H = \frac{100}{2 \times 10} = \frac{100}{20} = 5\,\text{m}$$

Why other options are wrong:

- Option A (10 m): uses $\sin\theta$ instead of $\sin^2\theta$.
- Option C (15 m): uses $\theta = 60°$.
- Option D (2.5 m): divides by $4g$.

Final Answer: $H = 5$ m $\Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q3

Q4.

Solution

Concept — Average Speed (Equal Distances): For equal distances at v_1 and v_2, the average speed is the harmonic mean $v_{avg} = 2v_1v_2/(v_1 + v_2)$.

Step 1 — Numerator $2v_1v_2$:

$$2 \times 40 \times 60 = 4800$$

Step 2 — Denominator $v_1 + v_2$:

$$40 + 60 = 100$$

Step 3 — Divide:

$$v_{avg} = \frac{4800}{100} = 48\,\text{km/h}$$

Why other options are wrong:

- Option A (50 km/h): arithmetic mean $(40+60)/2$, wrong for equal distances.
- Option B (52 km/h): a guessed intermediate value.
- Option D (45 km/h): incorrect weighting.

Final Answer: $v_{avg} = 48$ km/h $\Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q4

Q5.

Solution

Concept — Convex Lens Magnification: $1/v - 1/u = 1/f$, then $m = v/u$ and $h' = m\,h$. Here $u = -30$ cm, $f = +20$ cm.

Step 1 — Find $1/v$:

$$\frac{1}{v} = \frac{1}{f} + \frac{1}{u} = \frac{1}{20} + \frac{1}{-30} = \frac{3}{60} - \frac{2}{60} = \frac{1}{60}$$

Step 2 — Image distance:

$$v = 60\,\text{cm}$$

Step 3 — Magnification:

$$m = \frac{v}{u} = \frac{60}{-30} = -2$$

Step 4 — Image height:

$$h' = |m|\,h = 2 \times 2 = 4\,\text{cm (inverted)}$$

Why other options are wrong:

- Option A (2 cm): assumes $m = 1$ (no magnification).
- Option B (6 cm): uses $v = 90$ cm.
- Option C (3 cm): uses $|m| = 1.5$.

Final Answer: $h' = 4$ cm $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q5

Q6.

Solution

Concept — Concave Mirror Magnification: $1/v + 1/u = 1/f$, then $m = -v/u$. With sign convention: $u = -45$ cm, $f = -15$ cm.

Step 1 — Find $1/v$:

$$\frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{-15} - \frac{1}{-45} = -\frac{3}{45} + \frac{1}{45} = -\frac{2}{45}$$

Step 2 — Image distance:

$$v = -\frac{45}{2} = -22.5\,\text{cm (real, in front)}$$

Step 3 — Magnification:

$$m = -\frac{v}{u} = -\frac{-22.5}{-45} = -0.5 \Rightarrow |m| = 0.5$$

Why other options are wrong:

- Option B (1.0): would require the object at the centre of curvature.
- Option C (2.0): inverts the ratio v/u.
- Option D (1.5): arithmetic error in $1/v$.

Final Answer: $|m| = 0.5 \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q6

Q7.

Solution

Concept — Peak EMF of a Rotating Coil: $\varepsilon_0 = NBA\omega$.

Step 1 — Multiply N and B:

$$NB = 100 \times 0.2 = 20$$

Step 2 — Multiply by area A:

$$NBA = 20 \times 0.05 = 1$$

Step 3 — Multiply by ω:

$$\varepsilon_0 = 1 \times 100 = 100\,\text{V}$$

Why other options are wrong:

- Option A (50 V): uses $\omega = 50$ rad/s.
- Option B (200 V): uses $B = 0.4$ T.
- Option D (10 V): drops a factor of 10 in N.

Final Answer: $\varepsilon_0 = 100$ V $\Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q7

Q8.

Solution

Concept — Impedance of Series RC: $Z = \sqrt{R^2 + X_C^2}$.

Step 1 — Squares:

$$R^2 = 30^2 = 900, \quad X_C^2 = 40^2 = 1600$$

Step 2 — Sum:

$$R^2 + X_C^2 = 900 + 1600 = 2500$$

Step 3 — Square root:

$$Z = \sqrt{2500} = 50\,\Omega$$

(3-4-5 triple scaled by 10.)

Why other options are wrong:

- Option A (70 Ω): adds $R + X_C$ arithmetically.
- Option C (35 Ω): arithmetic mean of R and X_C.
- Option D (10 Ω): subtracts $X_C - R$.

Final Answer: $Z = 50\,\Omega \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q8

Q9.

Solution

Concept — Connected Blocks: First find the common acceleration of the system, then the string tension equals m_2a (the force needed to accelerate the trailing block m_2).

Step 1 — System acceleration:

$$a = \frac{F}{m_1 + m_2} = \frac{10}{2+3} = \frac{10}{5} = 2\,\text{m/s}^2$$

Step 2 — Tension pulls m_2: The only horizontal force on m_2 is the string tension T, so

$$T = m_2\,a = 3 \times 2 = 6\,\text{N}$$

Why other options are wrong:

- Option A (10 N): the full applied force, not the tension.
- Option B (4 N): uses m_1a instead of m_2a.
- Option C (2 N): reports the acceleration value, not the tension.

Final Answer: $T = 6$ N $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q9

Q10.

Solution

Concept — Work-Energy Theorem: $W = \Delta KE = KE_f - KE_i$.

Step 1 — Initial kinetic energy:

$$KE_i = \frac{1}{2}mv^2 = \frac{1}{2} \times 2 \times 10^2 = \frac{1}{2} \times 2 \times 100 = 100\,\text{J}$$

Step 2 — Final kinetic energy (at rest):

$$KE_f = 0$$

Step 3 — Work done:

$$W = KE_f - KE_i = 0 - 100 = -100\,\text{J}$$

Why other options are wrong:

- Option B (-200 J): forgets the factor $\frac{1}{2}$.
- Option C (-50 J): uses $m = 1$ kg.
- Option D (-20 J): uses v instead of v^2.

Final Answer: $W = -100$ J $\Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q10

Q11.

Solution

Concept — Field of a Point Charge: $E = kq/r^2$.

Step 1 — Compute r^2:

$$r^2 = (0.3)^2 = 0.09\,\text{m}^2$$

Step 2 — Numerator kq:

$$kq = 9 \times 10^9 \times 2 \times 10^{-6} = 1.8 \times 10^4$$

Step 3 — Divide by r^2:

$$E = \frac{1.8 \times 10^4}{0.09} = 2 \times 10^5 \, \text{N/C}$$

Why other options are wrong:

- Option A (6×10^4 N/C): divides by $r = 0.3$ (not r^2).
- Option C (6×10^5 N/C): uses $r = 0.1$ m incorrectly combined.
- Option D (2×10^4 N/C): drops one power of 10 in kq.

Final Answer: $E = 2 \times 10^5$ N/C $\Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q11

Q12.

Solution

Concept — Magnetic Moment of a Loop: $m = NIA$.

Step 1 — Multiply N and I:

$$NI = 50 \times 2 = 100$$

Step 2 — Multiply by area A:

$$m = 100 \times 0.01 = 1 \, \text{A} \cdot \text{m}^2$$

Why other options are wrong:

- Option A (0.5 A·m^2): uses $I = 1$ A.
- Option B (100 A·m^2): forgets to multiply by the area A.
- Option C (2 A·m^2): drops the factor N.

Final Answer: $m = 1$ A·m^2 $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q12

Q13.

Solution

Concept — Stopping Potential: $eV_0 = hf - \phi$, so $V_0 = (hf - \phi)/e$.

Step 1 — Photon energy hf in joules:

$$hf = 6.6 \times 10^{-34} \times 1 \times 10^{15} = 6.6 \times 10^{-19}\,\text{J}$$

Step 2 — Convert hf to eV:

$$hf = \frac{6.6 \times 10^{-19}}{1.6 \times 10^{-19}} = 4.125\,\text{eV}$$

Step 3 — Subtract work function:

$$eV_0 = 4.125 - 2 = 2.125\,\text{eV}$$

Step 4 — Stopping potential:

$$V_0 = 2.125\,\text{V} \approx 2.1\,\text{V}$$

Why other options are wrong:

- Option A (4.1 V): forgets to subtract ϕ.
- Option B (1.1 V): uses $\phi = 3$ eV.
- Option D (6.6 V): reports hf in joules$\times 10^{19}$ as volts.

Final Answer: $V_0 \approx 2.1$ V $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q13

Q14.

Solution

Concept — Bohr Orbit Energy: $E_n = -13.6/n^2$ eV.

Step 1 — Compute n^2 for $n = 2$:

$$n^2 = 2^2 = 4$$

Step 2 — Substitute:

$$E_2 = -\frac{13.6}{4} = -3.4\,\text{eV}$$

Why other options are wrong:

- Option B (-13.6 eV): is the ground state ($n = 1$).
- Option C (-6.8 eV): divides by $n = 2$ instead of $n^2 = 4$.
- Option D (-1.51 eV): is the $n = 3$ level.

Final Answer: $E_2 = -3.4$ eV $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q14

Q15.

Solution

Concept — Isobaric Work: $W = P\,\Delta V$ (pressure constant).

Step 1 — Substitute the values:

$$W = 2 \times 10^5 \times 0.01$$

Step 2 — Multiply:

$$W = 2 \times 10^5 \times 10^{-2} = 2 \times 10^3 = 2000\,\text{J}$$

Why other options are wrong:

- Option A (200 J): uses $\Delta V = 0.001$ m^3.
- Option C (20000 J): uses $\Delta V = 0.1$ m^3.
- Option D (2×10^6 J): forgets to multiply by ΔV (treats it as 10).

Final Answer: $W = 2000$ J $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q15

Q16.

Solution

Concept — Simple Pendulum: $T = 2\pi\sqrt{L/g}$.

Step 1 — Ratio L/g:

$$\frac{L}{g} = \frac{1}{10} = 0.1$$

Step 2 — Square root:

$$\sqrt{0.1} \approx 0.316$$

Step 3 — Multiply by 2π:

$$T = 2 \times 3.14 \times 0.316 = 6.28 \times 0.316 \approx 1.99 \approx 2\,\text{s}$$

Why other options are wrong:

- Option A (1 s): forgets the 2π factor.
- Option B (6.28 s): uses $\sqrt{L/g} = 1$ (ignores the ratio).
- Option C (3.14 s): uses π instead of 2π.

Final Answer: $T \approx 2$ s $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q16

Q17.

Solution

Concept — Moment of Inertia of a Ring: About the central axis, $I = MR^2$.

Step 1 — Compute R^2:

$$R^2 = (0.5)^2 = 0.25\,\text{m}^2$$

Step 2 — Multiply by M:

$$I = 2 \times 0.25 = 0.5\,\text{kg} \cdot \text{m}^2$$

Why other options are wrong:

- Option A (1.0): forgets to square R (uses MR).
- Option B (0.25): forgets the factor $M = 2$.
- Option D (2.0): uses $R = 1$ m.

Final Answer: $I = 0.5\ \text{kg}{\cdot}\text{m}^2 \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q17

Q18.

Solution

Concept — NAND Gate: $Y = \overline{A \cdot B}$. It is an AND followed by a NOT, so the output is LOW only when both inputs are HIGH.

Step 1 — AND of inputs:

$$A \cdot B = 1 \cdot 1 = 1$$

Step 2 — Invert:

$$Y = \overline{1} = 0$$

Why other options are wrong:

- Option B (1): this is the AND output, not the inverted NAND output.
- Option C ($A + B$): an OR expression, not NAND.
- Option D ($A \cdot B$): the AND result before inversion.

Final Answer: $Y = 0 \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q18

Q19.

Solution

Concept — Excess Pressure in a Drop: A liquid drop has one surface, so $\Delta P = 2T/r$.

Step 1 — Convert radius:

$$r = 2\,\text{mm} = 2 \times 10^{-3}\,\text{m}$$

Step 2 — Numerator $2T$:

$$2T = 2 \times 0.072 = 0.144$$

Step 3 — Divide by r:

$$\Delta P = \frac{0.144}{2 \times 10^{-3}} = 72\,\text{Pa}$$

Why other options are wrong:

- Option A (36 Pa): uses T/r (drops the factor 2).
- Option C (144 Pa): uses $4T/r$ (bubble formula, two surfaces).
- Option D (0.072 Pa): forgets to divide by r.

Final Answer: $\Delta P = 72$ Pa $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q19

Q20.

Solution

Concept — Gravity at Depth: $g' = g(1 - d/R)$.

Step 1 — Ratio d/R for $d = R/2$:

$$\frac{d}{R} = \frac{R/2}{R} = \frac{1}{2} = 0.5$$

Step 2 — Substitute:

$$g' = 10\,(1 - 0.5) = 10 \times 0.5 = 5\,\text{m/s}^2$$

Why other options are wrong:

- Option A (10 m/s^2): assumes no change with depth.
- Option B (2.5 m/s^2): uses $d = 3R/4$.
- Option D (0 m/s^2): true only at the centre ($d = R$).

Final Answer: $g' = 5$ m/s^2 $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q20

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	D	2	A	3	B	4	C	5	D
6	A	7	C	8	B	9	D	10	A
11	B	12	D	13	C	14	A	15	B
16	D	17	C	18	A	19	B	20	C