GAT-B Physics

Sample Paper – 3

Duration: 23 Minutes **Maximum Marks: 15**

Instructions

- This paper contains **15 Multiple Choice Questions** (Single Correct Answer), modelled on the Physics portion of **GAT-B** Section A.
- Each correct answer carries **+1 mark**. There is a deduction of **0.5 mark** for each wrong answer. Unattempted questions carry zero marks.
- Only **one** option is correct per question.
- Syllabus level: **Class 11 & 12 (NCERT) Physics** — Mechanics, Thermodynamics, Waves, Optics, Electricity & Magnetism, Modern Physics.
- Personal calculators, mobile phones, and other electronic gadgets are strictly prohibited. A simple on-screen calculator is provided in the CBT interface.

Q1. The SI unit of pressure is the Pascal (Pa). How many dyne cm^{-2} is equivalent to $1\ \mathrm{Pa}$?

(A) $1\ \mathrm{dyne\,cm^{-2}}$

(B) $10\ \mathrm{dyne\,cm^{-2}}$

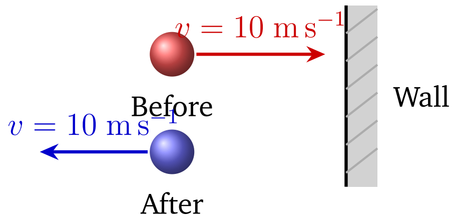
(C) $100\ \mathrm{dyne\,cm^{-2}}$

(D) $0.1\ \mathrm{dyne\,cm^{-2}}$

Q2. A stone is thrown vertically upward from the ground with an initial speed of $30\ \mathrm{m\,s^{-1}}$. Taking $g = 10\ \mathrm{m\,s^{-2}}$, the total time of flight of the stone is:

(A) 3 s
(B) 4 s
(C) 5 s
(D) 6 s

Q3. A rubber ball of mass 0.2 kg travelling at $10\ \mathrm{m\,s^{-1}}$ strikes a rigid wall perpendicularly and rebounds with the *same* speed, as shown in the diagram below.



The magnitude of the impulse exerted by the wall on the ball is:

(A) $4\ \mathrm{N\,s}$
(B) $2\ \mathrm{N\,s}$
(C) $0\ \mathrm{N\,s}$
(D) $8\ \mathrm{N\,s}$

Q4. A spring of force constant $k = 200\ \mathrm{N\,m^{-1}}$ is compressed by $x = 0.10$ m from its natural length. The elastic potential energy stored in the spring is:

(A) 2 J
(B) 0.5 J
(C) 1 J
(D) 4 J

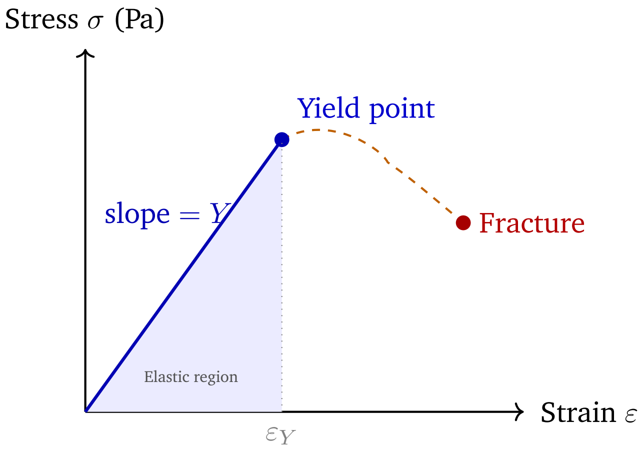
Q5. A small sphere falls through a viscous liquid and attains a terminal velocity v_0. If the radius of the sphere is doubled while the density difference between the sphere and the liquid, the viscosity, and g all remain unchanged, the new terminal velocity will be:

(A) $v_0/4$
(B) $4\,v_0$
(C) $2\,v_0$
(D) $v_0/2$

Q6. A satellite of mass m revolves in a circular orbit of radius $2R$ about the Earth, where R is Earth's radius and g is the gravitational acceleration at Earth's surface. The binding energy of the satellite (minimum energy required to remove it to infinity) is:

(A) $\dfrac{mgR}{2}$
(B) mgR
(C) $\dfrac{mgR}{8}$
(D) $\dfrac{mgR}{4}$

Q7. A steel wire of length $L = 2\ \mathrm{m}$ and cross-sectional area $A = 1\ \mathrm{mm}^2$ is stretched by a force $F = 100\ \mathrm{N}$, producing an extension $\Delta L = 1\ \mathrm{mm}$. The stress–strain graph for the wire is shown below. What is the Young's modulus of the wire?



(A) 2×10^{11} Pa

(B) 2×10^{12} Pa

(C) 2×10^{10} Pa

(D) 4×10^{11} Pa

Q8. The rms speed of oxygen molecules ($M = 32 \times 10^{-3}$ kg mol^{-1}) at $T = 300$ K is closest to: (take $R = 8.3$ J mol^{-1} K^{-1})

(A) $390\ \mathrm{m\,s^{-1}}$

(B) $580\ \mathrm{m\,s^{-1}}$

(C) $483\ \mathrm{m\,s^{-1}}$

(D) $720\ \mathrm{m\,s^{-1}}$

Q9. Two tuning forks, when sounded simultaneously, produce 4 beats per second. The frequency of one fork is 256 Hz. Which of the following could be the frequency of the other fork?

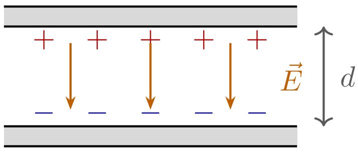
(A) 252 Hz only

(B) 252 Hz or 260 Hz

(C) 260 Hz only

(D) 258 Hz or 262 Hz

Q10. A parallel-plate capacitor carries a fixed charge Q and has plate separation d, as shown in the diagram. When the plate separation is doubled to $2d$ while the charge Q is kept constant (isolated capacitor), the energy stored in the capacitor:



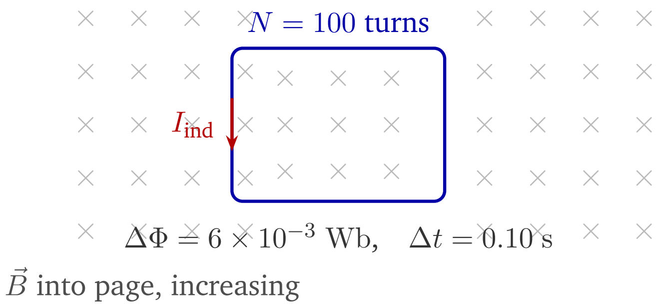
Charge Q fixed (isolated capacitor)

(A) halves
(B) remains the same
(C) becomes four times
(D) doubles

Q11. A circular coil of radius $R = 0.10$ m carries a steady current $I = 2$ A. The magnitude of the magnetic field at the centre of the coil is ($\mu_0 = 4\pi \times 10^{-7}\ \mathrm{T\,m\,A^{-1}}$):

(A) $4\pi\ \mu\mathrm{T}$
(B) $2\pi\ \mu\mathrm{T}$
(C) $8\pi\ \mu\mathrm{T}$
(D) $\pi\ \mu\mathrm{T}$

Q12. A rectangular coil of $N = 100$ turns is placed in a region where the magnetic field is directed into the page and increasing uniformly with time, as shown. The total magnetic flux through the coil changes from 2×10^{-3} Wb to 8×10^{-3} Wb in 0.10 s. The magnitude of the induced emf is:



(A) 0.6 V
(B) 60 V
(C) 6 V
(D) 0.06 V

Q13. In Young's double-slit experiment, the two slits are separated by $d = 0.5$ mm and the screen is placed $D = 1.0$ m away from the slits. Light of wavelength $\lambda = 500$ nm is used. The fringe width on the screen is:

(A) 0.5 mm
(B) 1.0 mm
(C) 2.0 mm
(D) 0.25 mm

Q14. Electrons are accelerated through a potential difference of $V = 20$ kV and strike a metal target to produce X-rays. The minimum (cut-off) wavelength of the X-rays produced is:
($h = 6.626 \times 10^{-34}$ J s, $c = 3 \times 10^{8}$ m s^{-1}, $e = 1.6 \times 10^{-19}$ C)

(A) 0.124 nm
(B) 0.621 nm
(C) 0.124
(D) 0.621

Q15. In a p-n junction diode under **forward bias**:

(A) the depletion region narrows and the junction resistance decreases

(B) the depletion region widens and the junction resistance increases

(C) the depletion region is unaffected but the junction resistance decreases

(D) the depletion region narrows and the junction resistance increases

Detailed Solutions

Q1.

Solution

Concept — Unit Conversion (SI to CGS): Pressure = force ÷ area. We convert both force and area separately.

Step 1 — Convert force:

$$1\ \text{N} = 10^5\ \text{dyne}$$

Step 2 — Convert area:

$$1\ \text{m}^2 = (10^2\ \text{cm})^2 = 10^4\ \text{cm}^2$$

Step 3 — Combine:

$$1\ \text{Pa} = \frac{1\ \text{N}}{1\ \text{m}^2} = \frac{10^5\ \text{dyne}}{10^4\ \text{cm}^2} = 10\ \text{dyne}\,\text{cm}^{-2}$$

Why other options are wrong:

- Option A ($1\ \text{dyne}\,\text{cm}^{-2}$): Ignores the $10^5/10^4 = 10$ ratio; off by a factor of 10.
- Option C ($100\ \text{dyne}\,\text{cm}^{-2}$): Incorrect power-of-ten arithmetic; treats $1\ \text{m}^2 = 10^3\ \text{cm}^2$ erroneously.
- Option D ($0.1\ \text{dyne}\,\text{cm}^{-2}$): Inverts the ratio, placing 10^4 in the numerator and 10^5 in the denominator.

Final Answer: $1\ \text{Pa} = 10\ \text{dyne}\,\text{cm}^{-2} \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q 1

Q2.

Solution

Concept — Vertical Throw: Time of Flight: For a body thrown vertically upward with initial speed u and returning to the same level, the total time of flight is:

$$T = \frac{2u}{g}$$

This follows from symmetry: the time to reach the highest point (u/g) equals the time to fall back.

Step 1 — Identify given data: $u = 30\ \mathrm{m\,s^{-1}}$, $g = 10\ \mathrm{m\,s^{-2}}$.

Step 2 — Apply the formula:

$$T = \frac{2 \times 30}{10} = 6\ \mathrm{s}$$

Why other options are wrong:

- Option A ($3\ \mathrm{s}$): Gives only the time to reach maximum height ($t_{\mathrm{up}} = u/g = 3\ \mathrm{s}$), not the full round trip.
- Option B ($4\ \mathrm{s}$): Results from using an incorrect value $g = 15\ \mathrm{m\,s^{-2}}$.
- Option C ($5\ \mathrm{s}$): Corresponds to $u = 25\ \mathrm{m\,s^{-1}}$; wrong initial speed used.

Final Answer: $T = 6\ \mathrm{s} \Rightarrow \boxed{\mathrm{D}}$

Answer: (D) **Go Back to Q 2**

Q3.

Solution

Concept — Impulse–Momentum Theorem: The impulse delivered to an object equals its change in momentum:

$$J = \Delta p = m\,(v_f - v_i)$$

Step 1 — Define positive direction: Take the initial direction of motion (towards the wall) as positive.

$$v_i = +10\ \mathrm{m\,s^{-1}}, \qquad v_f = -10\ \mathrm{m\,s^{-1}}\ \text{(reversed after rebound)}$$

Step 2 — Compute impulse:

$$J = m\,(v_f - v_i) = 0.2 \times (-10 - 10) = 0.2 \times (-20) = -4\ \mathrm{N\,s}$$

Magnitude $|J| = 4\ \mathrm{N\,s}$.

Why other options are wrong:

- Option B ($2\ \mathrm{N\,s}$): Uses only one velocity ($mv = 0.2 \times 10$), ignoring the reversal of direction.
- Option C (0): Incorrectly assumes zero net change in momentum because the speeds are equal, forgetting that *direction* changed.

- Option D ($8\ \mathrm{N\,s}$): Doubles the correct answer without physical justification.

Final Answer: $|J| = 4\ \mathrm{N\,s} \Rightarrow \boxed{\mathrm{A}}$

Answer: (A) Go Back to Q 3

Q4.

Solution

Concept — Elastic Potential Energy of a Spring:

$$U = \tfrac{1}{2}\,k\,x^2$$

Step 1 — Identify given quantities: $k = 200\ \mathrm{N\,m^{-1}}$, $x = 0.10\ \mathrm{m}$.

Step 2 — Substitute:

$$U = \frac{1}{2} \times 200 \times (0.10)^2 = 100 \times 0.010 = 1\ \mathrm{J}$$

Why other options are wrong:

- Option A ($2\ \mathrm{J}$): Omits the factor of $\frac{1}{2}$, computing kx^2 instead of $\frac{1}{2}kx^2$.
- Option B ($0.5\ \mathrm{J}$): Uses $x = 0.05\ \mathrm{m}$ (half the given compression).
- Option D ($4\ \mathrm{J}$): Uses $x = 0.20\ \mathrm{m}$ (double the given compression), giving $\frac{1}{2} \times 200 \times 0.04 = 4\ \mathrm{J}$.

Final Answer: $U = 1\ \mathrm{J} \Rightarrow \boxed{\mathrm{C}}$

Answer: (C) Go Back to Q 4

Q5.

Solution

Concept — Stokes' Law and Terminal Velocity: According to Stokes' law, the terminal velocity of a sphere of radius r falling through a liquid of viscosity η is:

$$v_t = \frac{2r^2\,(\rho - \sigma)\,g}{9\,\eta}$$

With all other quantities fixed, $v_t \propto r^2$.

Step 1 — Find the ratio when $r \to 2r$:

$$\frac{v_{\text{new}}}{v_0} = \frac{(2r)^2}{r^2} = 4$$

Step 2 — Conclude:

$$v_{\text{new}} = 4\,v_0$$

Why other options are wrong:

- Option A ($v_0/4$): Inverts the dependence; applies $v_t \propto 1/r^2$ instead of $v_t \propto r^2$.
- Option C ($2\,v_0$): Assumes $v_t \propto r$ (linear), missing the square dependence on radius.
- Option D ($v_0/2$): Same linear error as C but inverted.

Final Answer: $v_{\text{new}} = 4\,v_0 \Rightarrow \boxed{\text{B}}$

Answer: (B) **Go Back to Q 5**

Q6.

Solution

Concept — Binding Energy of a Satellite in Circular Orbit: The total mechanical energy of a satellite at orbital radius r is:

$$E_{\text{total}} = -\frac{GMm}{2r}$$

The binding energy (energy to remove it to infinity) is $E_{\text{bind}} = -E_{\text{total}} = \dfrac{GMm}{2r}$.

Step 1 — Express GM in terms of surface quantities: At Earth's surface, $g = GM/R^2 \Rightarrow GM = gR^2$.

Step 2 — Substitute $r = 2R$:

$$E_{\text{bind}} = \frac{gR^2\,m}{2 \times 2R} = \frac{mgR}{4}$$

Why other options are wrong:

- Option A ($mgR/2$): Uses $r = R$ (surface level), not the orbital radius $2R$.
- Option B (mgR): Corresponds to the escape energy from Earth's surface, not from orbit at $2R$.
- Option C ($mgR/8$): Arises from using $r = 4R$; double the actual orbital

radius.

Final Answer: $E_{\text{bind}} = \dfrac{mgR}{4} \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q 6

Q7.

Solution

Concept — Young's Modulus:

$$Y = \frac{\text{Stress}}{\text{Strain}} = \frac{F/A}{\Delta L/L} = \frac{FL}{A\,\Delta L}$$

Step 1 — Compute stress:

$$A = 1\ \text{mm}^2 = 1 \times 10^{-6}\ \text{m}^2, \qquad \sigma = \frac{F}{A} = \frac{100}{1 \times 10^{-6}} = 10^8\ \text{Pa}$$

Step 2 — Compute strain:

$$\Delta L = 1\ \text{mm} = 1 \times 10^{-3}\ \text{m}, \qquad \varepsilon = \frac{\Delta L}{L} = \frac{1 \times 10^{-3}}{2} = 5 \times 10^{-4}$$

Step 3 — Calculate Y:

$$Y = \frac{\sigma}{\varepsilon} = \frac{10^8}{5 \times 10^{-4}} = 2 \times 10^{11}\ \text{Pa}$$

(This matches the standard accepted value for steel, $Y \approx 2 \times 10^{11}$ Pa.)

Why other options are wrong:

- Option B (2×10^{12} Pa): Uses $\Delta L = 0.1$ mm instead of 1 mm; strain 10 times smaller.
- Option C (2×10^{10} Pa): Uses $\Delta L = 10$ mm; strain 10 times larger.
- Option D (4×10^{11} Pa): Doubles the correct result; possibly from using $A = 0.5\ \text{mm}^2$.

Final Answer: $Y = 2 \times 10^{11}\ \text{Pa} \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q 7

Q8.

Solution

Concept — RMS Speed from Kinetic Theory:

$$v_{\text{rms}} = \sqrt{\frac{3RT}{M}}$$

Step 1 — Substitute values: $R = 8.3\ \text{J mol}^{-1}\text{K}^{-1}$, $T = 300\ \text{K}$, $M = 32 \times 10^{-3}\ \text{kg mol}^{-1}$.

$$v_{\text{rms}} = \sqrt{\frac{3 \times 8.3 \times 300}{32 \times 10^{-3}}} = \sqrt{\frac{7470}{0.032}} = \sqrt{233437.5} \approx 483\ \text{m s}^{-1}$$

Why other options are wrong:

- Option A ($390\ \text{m s}^{-1}$): Uses $\sqrt{8RT/(\pi M)}$, which is the formula for *mean* (average) speed, not rms speed.
- Option B ($580\ \text{m s}^{-1}$): Corresponds to using $M = 22 \times 10^{-3}\ \text{kg mol}^{-1}$ (nitrogen); wrong molar mass.
- Option D ($720\ \text{m s}^{-1}$): Corresponds to $T \approx 460\ \text{K}$; wrong temperature.

Final Answer: $v_{\text{rms}} \approx 483\ \text{m s}^{-1} \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q 8

Q9.

Solution

Concept — Beats from Superposition of Two Frequencies: When two sources of frequencies f_1 and f_2 are sounded together, the beat frequency is:

$$n_{\text{beat}} = |f_1 - f_2|$$

Given n_{beat}, there are *two* possible values for the unknown frequency.

Step 1 — Set up the equation: $f_1 = 256\ \text{Hz}$, $n_{\text{beat}} = 4\ \text{Hz}$:

$$|f_2 - 256| = 4 \implies f_2 = 256 - 4 = 252\ \text{Hz} \quad \text{or} \quad f_2 = 256 + 4 = 260\ \text{Hz}$$

Why other options are wrong:

- Option A ($252\ \text{Hz}$ only): Incomplete; ignores the $f_2 = 260\ \text{Hz}$ solution.

- Option C (260 Hz only): Incomplete; ignores the $f_2 = 252$ Hz solution.
- Option D (258 or 262 Hz): Corresponds to a beat frequency of 2 Hz and 6 Hz respectively; wrong beat count.

Final Answer: $f_2 = 252$ Hz or 260 Hz $\Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q 9

Q10.

Solution

Concept — Energy in a Capacitor with Fixed Charge: For an isolated (constant charge Q) capacitor:

$$U = \frac{Q^2}{2C}$$

The capacitance of a parallel-plate capacitor is $C = \dfrac{\varepsilon_0 A}{d}$, so $C \propto \dfrac{1}{d}$.

Step 1 — Effect of doubling plate separation: $d \to 2d \Rightarrow C \to \dfrac{C_0}{2}$.

Step 2 — Effect on energy (charge Q fixed):

$$U_{\text{new}} = \frac{Q^2}{2\,(C_0/2)} = \frac{Q^2}{C_0} = 2\,U_0$$

The energy **doubles**. Physically, the work done by the external agent in pulling the plates apart (against the attractive force) becomes stored as extra electric energy.

Why other options are wrong:

- Option A (halves): Applies when the *voltage* is kept constant ($U = \frac{1}{2}CV^2$); for fixed V, doubling d halves C and hence halves U. But here Q, not V, is fixed.
- Option B (unchanged): True only if both Q and C scale in the same way simultaneously.
- Option C (four times): Would result from doubling Q rather than doubling d.

Final Answer: Energy doubles $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q 10

Q11.

Solution

Concept — Biot–Savart Law: Magnetic Field at Centre of a Circular Loop:

$$B = \frac{\mu_0 I}{2R}$$

Step 1 — Substitute given values: $\mu_0 = 4\pi \times 10^{-7}\ \mathrm{T\,m\,A^{-1}},\ I = 2\ \mathrm{A},\ R = 0.10\ \mathrm{m}$.

$$B = \frac{4\pi \times 10^{-7} \times 2}{2 \times 0.10} = \frac{8\pi \times 10^{-7}}{0.20} = 4\pi \times 10^{-6}\ \mathrm{T} = 4\pi\ \mu\mathrm{T}$$

Why other options are wrong:

- Option B ($2\pi\ \mu$T): Uses $R = 0.20$ m or $I = 1$ A; off by a factor of 2.
- Option C ($8\pi\ \mu$T): Omits the factor of 2 in the denominator, using $B = \mu_0 I/R$.
- Option D ($\pi\ \mu$T): Off by a factor of 4; results from using $R = 0.40$ m.

Final Answer: $B = 4\pi\ \mu\mathrm{T} \Rightarrow \boxed{\mathrm{A}}$

Answer: (A) Go Back to Q 11

Q12.

Solution

Concept — Faraday's Law of Electromagnetic Induction: The magnitude of the induced emf in a coil of N turns is:

$$|\mathcal{E}| = N \left| \frac{\Delta\Phi}{\Delta t} \right|$$

By Lenz's law the induced current opposes the change in flux.

Step 1 — Identify quantities: $N = 100,\ \Delta\Phi = (8 - 2) \times 10^{-3}\ \mathrm{Wb} = 6 \times 10^{-3}\ \mathrm{Wb}$, $\Delta t = 0.10$ s.

Step 2 — Compute:

$$|\mathcal{E}| = 100 \times \frac{6 \times 10^{-3}}{0.10} = 100 \times 6 \times 10^{-2} = 6\ \mathrm{V}$$

Why other options are wrong:

- Option A (0.6 V): Forgets to multiply by $N = 100$; treats the coil as a single-

turn loop.
- Option B (60 V): Uses total flux (8×10^{-3} Wb) instead of the *change* in flux.
- Option D (0.06 V): Divides by $N = 100$ instead of multiplying; a sign/direction error.

Final Answer: $|\mathcal{E}| = 6 \text{ V} \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q 12

Q13.

Solution

Concept — YDSE Fringe Width: The fringe width (spacing between successive bright or dark fringes) in Young's double-slit experiment is:

$$\beta = \frac{\lambda D}{d}$$

Step 1 — Convert units and substitute: $\lambda = 500 \text{ nm} = 500 \times 10^{-9} \text{ m}$, $D = 1.0 \text{ m}$, $d = 0.5 \text{ mm} = 5 \times 10^{-4} \text{ m}$.

$$\beta = \frac{500 \times 10^{-9} \times 1.0}{5 \times 10^{-4}} = \frac{5 \times 10^{-7}}{5 \times 10^{-4}} = 1.0 \times 10^{-3} \text{ m} = 1.0 \text{ mm}$$

Why other options are wrong:

- Option A (0.5 mm): Uses $D = 0.5$ m instead of 1.0 m; halves the correct fringe width.
- Option C (2.0 mm): Uses $d = 0.25$ mm (half the given slit separation); doubles fringe width.
- Option D (0.25 mm): Uses $D = 0.25$ m; a quarter of the correct answer.

Final Answer: $\beta = 1.0 \text{ mm} \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q 13

Q14.

Solution

Concept — Duane–Hunt Law (Minimum X-ray Wavelength): All the kinetic energy of an electron, gained by acceleration through potential V, is converted into a single photon of maximum energy (shortest wavelength):

$$eV = \frac{hc}{\lambda_{\text{min}}} \implies \lambda_{\text{min}} = \frac{hc}{eV}$$

Step 1 — Substitute values: $h = 6.626 \times 10^{-34}\ \text{J s}$, $c = 3 \times 10^{8}\ \text{m s}^{-1}$, $e = 1.6 \times 10^{-19}\ \text{C}$, $V = 20 \times 10^{3}\ \text{V}$.

$$\lambda_{\text{min}} = \frac{6.626 \times 10^{-34} \times 3 \times 10^{8}}{1.6 \times 10^{-19} \times 20 \times 10^{3}} = \frac{1.988 \times 10^{-25}}{3.2 \times 10^{-15}} \approx 6.21 \times 10^{-11}\ \text{m}$$

Step 2 — Convert to angstroms: $1\ \ = 10^{-10}\ \text{m}$, so:

$$6.21 \times 10^{-11}\ \text{m} = 0.621$$

Why other options are wrong:

- Option A (0.124 nm): Correct value in Å (0.621) but misidentified as nm; also $0.124\ \text{nm} \approx 1.24$ which corresponds to $V = 10\ \text{kV}$.
- Option B (0.621 nm): Right digits but wrong unit; $0.621\ \text{nm} = 6.21$, ten times too large.
- Option C (0.124): Corresponds to $V = 100\ \text{kV}$; ten times higher than the given voltage.

Final Answer: $\lambda_{\text{min}} = 0.621 \Rightarrow \boxed{\text{D}}$

Answer: (D) **Go Back to Q 14**

Q15.

Solution

Concept — p-n Junction Under Forward Bias: In a p-n junction at equilibrium, the depletion region forms a potential barrier that opposes majority carrier flow.

Step 1 — Effect on the depletion region: In forward bias the positive terminal is connected to the p-side and the negative terminal to the n-side. The external electric field *opposes* the built-in field, driving holes (from p) and electrons (from n) towards the junction. This reduces the width of the depletion region.

Step 2 — Effect on resistance: A narrower depletion region means a lower potential barrier. Majority carriers can now cross the junction easily, so the junction resistance *decreases* and a significant forward current flows.

Why other options are wrong:

- Option B: Correctly describes *reverse bias* behavior, where the external field aids the built-in field, widening the depletion region and increasing resistance.
- Option C: Incorrect because the depletion region is always affected by applied bias; it cannot remain unchanged when an external field is present.
- Option D: Self-contradictory — a narrowing depletion region always corresponds to a *decrease* in resistance, not an increase.

Final Answer: Depletion region narrows; junction resistance decreases $\Rightarrow \boxed{\text{A}}$

$\boxed{\text{Answer: (A)}}$ **Go Back to Q 15**

Answer Key

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