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AIPMT 2010 (PRELIMS)

Question Paper · answer key at the end

Time: 3 Hours 20 Minutes **Max. Marks:** 812 **Questions:** 203

General Instructions:

1. The duration of the paper is 3 hours 20 minutes. It has 203 questions: Physics 52, Chemistry 52, Biology 99.
2. Each subject has Section A (35 questions) and Section B (15 questions — attempt any 10).
3. Every question has four options with only one correct answer.
4. Marking: +4 for each correct answer, −1 for each wrong answer, 0 for a question not answered.
5. The answer key is at the end. Scan the QR code beside any question for its step-by-step solution.
6. Practise this paper as a timed test on the real exam screen, free, at pyqside.com.

Section A (MCQ) — 203 questions

Q.1 The dimension of $\frac{1}{2}\varepsilon_0 E^2$, where ε_0 is permittivity of free space and E is electric field, is [AIPMT 2010 (Prelims)]

(1) ML^2T^{-2} (2) $ML^{-1}T^{-2}$
(3) ML^2T^{-1} (4) MLT^{-1}

Scan or tap for the full solution

Q.2 A particle moves a distance x in time t according to equation $x = (t + 5)^{-1}$. The acceleration of particle is proportional to [AIPMT 2010 (Prelims)]

(1) $(\text{velocity})^{3/2}$ (2) $(\text{distance})^2$
(3) $(\text{distance})^{-2}$ (4) $(\text{velocity})^{2/3}$

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Q.3 A ball is dropped from a high rise platform at t = 0 starting from rest. After 6 seconds another ball is thrown downwards from the same platform with a speed v. The two balls meet at t = 18 s. What is the value of v? (Take g = 10 m/s^2) [AIPMT 2010 (Prelims)]

(1) 75 m/s (2) 55 m/s (3) 40 m/s (4) 60 m/s

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Q.4 A particle has initial velocity $(3\hat{i}+4\hat{j})$ and has acceleration $(0.4\hat{i}+0.3\hat{j})$. Its speed after 10 s is [AIPMT 2010 (Prelims)]

(1) 7 units (2) $7\sqrt{2}$ units (3) 8.5 units (4) 10 units

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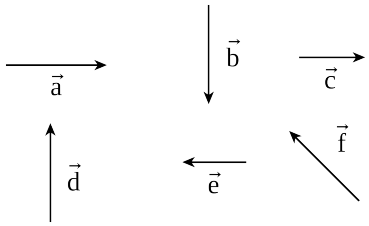
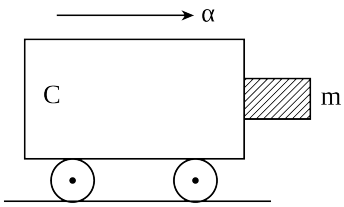
Q.5 Six vectors, $\vec{a}$ through $\vec{f}$ have the magnitudes and directions indicated in the figure. Which of the following statements is true? [AIPMT 2010 (Prelims)]



(1) $\vec{b}+\vec{c}=\vec{f}$ (2) $\vec{d}+\vec{c}=\vec{f}$
(3) $\vec{d}+\vec{e}=\vec{f}$ (4) $\vec{b}+\vec{e}=\vec{f}$

Scan or tap for the full solution

Q.6 A block of mass m is in contact with the cart C as shown in the figure.
The coefficient of static friction between the block and the cart is μ. The acceleration α of the cart that will prevent the block from falling satisfies [AIPMT 2010 (Prelims)]



(1) $\alpha > \frac{mg}{\mu}$ (2) $\alpha > \frac{g}{\mu m}$
(3) $\alpha \geq \frac{g}{\mu}$ (4) $\alpha < \frac{g}{\mu}$

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Q.7 A ball moving with velocity 2 m/s collides head on with another stationary ball of double the mass. If the coefficient of restitution is 0.5, then their velocities (in m/s) after collision will be [AIPMT 2010 (Prelims)]

(1) 0, 1 (2) 1, 1 (3) 1, 0.5 (4) 0, 2

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Q.8 An engine pumps water through a hose pipe. Water passes through the pipe and leaves it with a velocity of 2 m/s. The mass per unit length of water in the pipe is 100 kg/m. What is the power of the engine?

[AIPMT 2010 (Prelims)]

(1) 400 W (2) 200 W (3) 100 W (4) 800 W

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Q.9 A circular disk of moment of inertia I_t is rotating in a horizontal plane, about its symmetry axis, with a constant angular speed ω_i. Another disk of moment of inertia I_b is dropped coaxially onto the rotating disk. Initially the second disk has zero angular speed. Eventually both the disks rotate with a constant angular speed ω. The energy lost by the initially rotating disc to friction is

[AIPMT 2010 (Prelims)]

(1) $\frac{1}{2}\frac{I_b^2}{(I_t+I_b)}\omega_i^2$ (2) $\frac{1}{2}\frac{I_t^2}{(I_t+I_b)}\omega_i^2$

(3) $\frac{I_b-I_t}{(I_t+I_b)}\omega_i^2$ (4) $\frac{1}{2}\frac{I_bI_t}{(I_t+I_b)}\omega_i^2$

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Q.10 Two particles which are initially at rest, move towards each other under the action of their internal attraction. If their speeds are v and 2v at any instant, then the speed of centre of mass of the system will be : [AIPMT 2010 (Prelims)]

(1) 2v (2) zero (3) 1.5 v (4) v

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Q.11 A gramophone record is revolving with an angular velocity ω. A coin is placed at a distance r from the centre of the record. The static coefficient of friction is μ. The coin will revolve with the record if

[AIPMT 2010 (Prelims)]

(1) $r = \mu g\omega^2$ (2) $r < \frac{\omega^2}{\mu g}$ (3) $r \le \frac{\mu g}{\omega^2}$ (4) $r \ge \frac{\mu g}{\omega^2}$

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Q.12 A particle of mass M is situated at the centre of a spherical shell of same mass and radius a. The magnitude of the gravitational potential at a point situated at a/2 distance from the centre, will be :

[AIPMT 2010 (Prelims)]

(1) $\frac{GM}{a}$ (2) $\frac{2GM}{a}$ (3) $\frac{3GM}{a}$ (4) $\frac{4GM}{a}$

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Q.13 The radii of circular orbits of two satellites A and B of the earth, are 4R and R, respectively. If the speed of satellite A is 3V, then the speed of satellite B will be [AIPMT 2010 (Prelims)]

(1) $\frac{3V}{4}$ (2) 6V (3) 12V (4) $\frac{3V}{2}$

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Q.14 A man of 50 kg mass is standing in a gravity free space at a height of 10 m above the floor. He throws a stone of 0.5 kg mass downwards with a speed 2 m/s. When the stone reaches the floor, the distance of the man above the floor will be

[AIPMT 2010 (Prelims)]

(1) 9.9 m (2) 10.1 m (3) 10 m (4) 20 m

Scan or tap for the full solution

Q.15 A cylindrical metallic rod in thermal contact with two reservoirs of heat at its two ends conducts an amount of heat Q in time t. The metallic rod is melted and the material is formed into a rod of half the radius of the original rod. What is the amount of heat conducted by the new rod, when placed in thermal contact with the two reservoirs in time t?

[AIPMT 2010 (Prelims)]

(1) $\frac{Q}{4}$ (2) $\frac{Q}{16}$ (3) 2Q (4) $\frac{Q}{2}$

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Q.16 The total radiant energy per unit area, normal to the direction of incidence, received at a distance R from the centre of a star of radius r, whose outer surface radiates as a black body at a temperature T K is given by [AIPMT 2010 (Prelims)]

(1) $\frac{\sigma r^2T^4}{R^2}$ (2) $\frac{\sigma r^2T^4}{4\pi R^2}$ (3) $\frac{\sigma r^2T^4}{R^4}$ (4) $\frac{4\pi\sigma r^2T^4}{R^2}$

Scan or tap for the full solution

Q.17 Assuming the sun to have a spherical outer surface of radius r, radiating like a black body at temperature t°C, the power received by a unit surface, (normal to the incident rays) at a distance R from the centre of the sun is
where σ is the Stefan's constant.

[AIPMT 2010 (Prelims)]

(1) $\frac{r^2\sigma(t+273)^4}{4\pi R^2}$ (2) $\frac{16\pi^2r^2\sigma t^4}{R^2}$

(3) $\frac{r^2\sigma(t+273)^4}{R^2}$ (4) $\frac{4\pi r^2\sigma t^4}{R^2}$

Scan or tap for the full solution

Q.18 If ΔU and ΔW represent the increase in internal energy and work done by the system respectively in a thermodynamical process, which of the following is true? [AIPMT 2010 (Prelims)]

(1) $\Delta U = -\Delta W$, in an adiabatic process

(2) $\Delta U = \Delta W$, in an isothermal process

(3) $\Delta U = \Delta W$, in an adiabatic process

(4) $\Delta U = -\Delta W$, in an isothermal process

Scan or tap for the full solution

Q.19 The displacement of a particle along the x-axis is given by $x = a\sin^2\omega t$. The motion of the particle corresponds to [AIPMT 2010 (Prelims)]

(1) simple harmonic motion of frequency ω/π

(2) simple harmonic motion of frequency $3\omega/2\pi$

(3) non simple harmonic motion

(4) simple harmonic motion of frequency $\omega/2\pi$

Scan or tap for the full solution

Q.20 The period of oscillation of a mass M suspended from a spring of negligible mass is T. If along with it another mass M is also suspended, the period of oscillation will now be [AIPMT 2010 (Prelims)]

(1) T (2) $\frac{T}{\sqrt{2}}$ (3) 2T (4) $\sqrt{2}T$

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Q.21 A transverse wave is represented by $y = A\sin(\omega t - kx)$. For what value of the wavelength is the wave velocity equal to the maximum particle velocity? [AIPMT 2010 (Prelims)]

(1) $\pi A/2$ (2) πA (3) $2\pi A$ (4) A

Scan or tap for the full solution

Q.22 A tuning fork of frequency 512 Hz makes 4 beats per second with the vibrating string of a piano. The beat frequency decreases to 2 beats per sec when the tension in the piano string is slightly increased. The frequency of the piano string before increasing the tension was [AIPMT 2010 (Prelims)]

(1) 510 Hz (2) 514 Hz (3) 516 Hz (4) 508 Hz

Scan or tap for the full solution

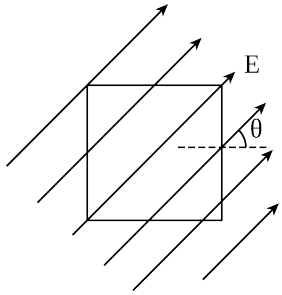
Q.23 Two positive ions, each carrying a charge q, are separated by a distance d. If F is the force of repulsion between the ions, the number of electrons missing from each ion will be (e being the charge on an electron) [AIPMT 2010 (Prelims)]

(1) $\frac{4\pi\varepsilon_0 Fd^2}{e^2}$ (2) $\sqrt{\frac{4\pi\varepsilon_0 Fe^2}{d^2}}$

(3) $\sqrt{\frac{4\pi\varepsilon_0 Fd^2}{e^2}}$ (4) $\frac{4\pi\varepsilon_0 Fd^2}{q^2}$

Scan or tap for the full solution

Q.24 A square surface of side L meter in the plane of the paper is placed in a uniform electric field E (volt/m) acting along the same plane at an angle θ with the horizontal side of the square as shown in figure.



The electric flux linked to the surface, in units of volt m is [AIPMT 2010 (Prelims)]

(1) EL^2 (2) $EL^2\cos\theta$

(3) $EL^2\sin\theta$ (4) zero

Scan or tap for the full solution

Q.25 A series combination of n_1 capacitors, each of value C_1, is charged by a source of potential difference 4V. When another parallel combination of n_2 capacitors, each of value C_2, is charged by a source of potential difference V, it has the same (total) energy stored in it as the first combination has. The value of C_2, in terms of C_1, is then [AIPMT 2010 (Prelims)]

(1) $\frac{2C_1}{n_1 n_2}$ (2) $16\frac{n_2}{n_1}C_1$

(3) $2\frac{n_2}{n_1}C_1$ (4) $\frac{16C_1}{n_1 n_2}$

Scan or tap for the full solution

Q.26 Consider the following two statements.
Which of the following is correct?

A. Kirchhoff's junction law follows from the conservation of charge.

B. Kirchhoff's loop law follows from the conservation of energy. [AIPMT 2010 (Prelims)]

(1) Both (A) and (B) are wrong

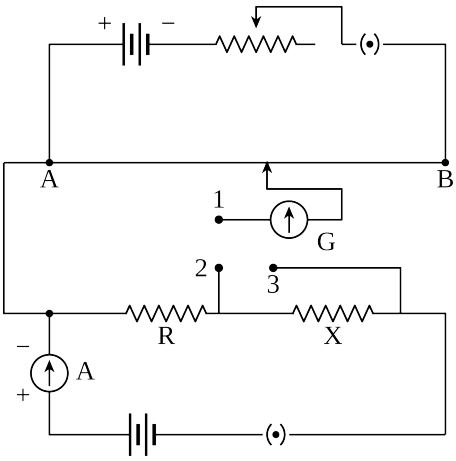
(2) (A) is correct and (B) is wrong

(3) (A) is wrong and (B) is correct

(4) Both (A) and (B) are correct

Scan or tap for the full solution

Q.27 A potentiometer circuit is set up as shown. The potential gradient, across the potentiometer wire, is k volt/cm and the ammeter, present in the circuit, reads 1.0 A when two way key is switched off. The balance points, when the key between the terminals (i) 1 and 2 (ii) 1 and 3, is plugged in, are found to be at length l_1 cm and l_2 cm respectively. The magnitudes, of the resistors R and X, in ohms, are then, equal, respectively, to [AIPMT 2010 (Prelims)]



(1) $k(l_2 - l_1)$ and kl_2 (2) kl_1 and $k(l_2 - l_1)$
(3) $k(l_2 - l_1)$ and kl_1 (4) kl_1 and kl_2

Scan or tap for the full solution

Q.28 Charge q is uniformly spread on a thin ring of radius R. The ring rotates about its axis with a uniform frequency f Hz. The magnitude of magnetic induction at the center of the ring is [AIPMT 2010 (Prelims)]

(1) $\frac{\mu_0 qf}{2\pi R}$ (2) $\frac{\mu_0 qf}{2R}$ (3) $\frac{\mu_0 q}{2fR}$ (4) $\frac{\mu_0 q}{2\pi fR}$

Scan or tap for the full solution

Q.29 A galvanometer has a coil of resistance 100 ohm and gives a full scale deflection for 30 mA current. If it is to work as a voltmeter of 30 volt range, the resistance required to be added will be [AIPMT 2010 (Prelims)]

(1) 900 Ω (2) 1800 Ω (3) 500 Ω (4) 1000 Ω

Scan or tap for the full solution

Q.30 A galvanometer has a coil of resistance 100 ohm and gives a full scale deflection for 30 mA current. If it is to work as a voltmeter of 30 volt range, the resistance required to be added will be [AIPMT 2010 (Prelims)]

(1) 900 Ω (2) 1800 Ω (3) 500 Ω (4) 1000 Ω

Scan or tap for the full solution

Q.31 A square current carrying loop is suspended in a uniform magnetic field acting in the plane of the loop. If the force on one arm of the loop is $\vec{F}$, the net force on the remaining three arms of the loop is [AIPMT 2010 (Prelims)]

(1) $3\vec{F}$ (2) $-\vec{F}$ (3) $-3\vec{F}$ (4) $\vec{F}$

Scan or tap for the full solution

Q.32 Electromagnets are made of soft iron because soft iron has [AIPMT 2010 (Prelims)]

(1) low retentivity and high coercive force
(2) high retentivity and high coercive force
(3) low retentivity and low coercive force
(4) high retentivity and low coercive force

Scan or tap for the full solution

Q.33 A vibration magnetometer placed in magnetic meridian has a small bar magnet. The magnet executes oscillations with a time period of 2 s in earth's horizontal magnetic field of 24 microtesla. When a horizontal field of 18 microtesla is produced opposite to the earth's field by placing a current carrying wire, the new time period of magnet will be [AIPMT 2010 (Prelims)]

(1) 1 s (2) 2 s (3) 3 s (4) 4 s

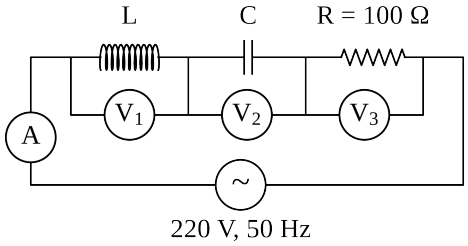
Scan or tap for the full solution

Q.34 A conducting circular loop is placed in a uniform magnetic field, B = 0.025 T with its plane perpendicular to the field. The radius of the loop is made to shrink at a constant rate of 1 mm s^{-1}. The induced emf when the radius is 2 cm, is [AIPMT 2010 (Prelims)]

(1) 2π μV (2) π μV (3) $\frac{\pi}{2}$ μV (4) 2 μV

Scan or tap for the full solution

Q.35 In the given circuit the readings of voltmeters V_1 and V_2 are 300 volts each. The readings of the voltmeter V_3 and ammeter A are respectively [AIPMT 2010 (Prelims)]



(1) 150 V, 2.2 A (2) 220 V, 2.2 A
(3) 220 V, 2.0 A (4) 100 V, 2.0 A

Scan or tap for the full solution

Q.36 A 220 volt input is supplied to a transformer. The output circuit draws a current of 2.0 ampere at 440 volts. If the efficiency of the transformer is 80%, the current drawn by the primary windings of the transformer is [AIPMT 2010 (Prelims)]

(1) 3.6 ampere (2) 2.8 ampere
(3) 2.5 ampere (4) 5.0 ampere

Scan or tap for the full solution

Q.37 Which of the following statements is false for the properties of electromagnetic waves? [AIPMT 2010 (Prelims)]

(1) Both electric and magnetic field vectors attain the maxima and minima at the same place and same time.
(2) The energy in electromagnetic wave is divided equally between electric and magnetic vectors.
(3) Both electric and magnetic field vectors are parallel to each other and perpendicular to the direction of propagation of wave.
(4) These waves do not require any material medium for propagation.

Scan or tap for the full solution

Q.38 A ray of light travelling in a transparent medium of refractive index μ, falls on a surface separating the medium from air at an angle of incidence of 45°. For which of the following value of μ the ray can undergo total internal reflection? [AIPMT 2010 (Prelims)]

(1) $\mu = 1.33$ (2) $\mu = 1.40$ (3) $\mu = 1.50$ (4) $\mu = 1.25$

Scan or tap for the full solution

Q.39 A lens having focal length f and aperture of diameter d forms an image of intensity I. Aperture of diameter $\frac{d}{2}$ in central region of lens is covered by a black paper. Focal length of lens and intensity of image now will be respectively [AIPMT 2010 (Prelims)]

(1) f and $\frac{I}{4}$ (2) $\frac{3f}{4}$ and $\frac{I}{2}$
(3) f and $\frac{3I}{4}$ (4) $\frac{f}{2}$ and $\frac{I}{2}$

Scan or tap for the full solution

Q.40 A beam of cathode rays is subjected to crossed electric (E) and magnetic fields (B). The fields are adjusted such that the beam is not deflected. The specific charge of the cathode rays is given by (Where V is the potential difference between cathode and anode) [AIPMT 2010 (Prelims)]

(1) $\frac{B^2}{2VE^2}$ (2) $\frac{2VB^2}{E^2}$ (3) $\frac{2VE^2}{B^2}$ (4) $\frac{E^2}{2VB^2}$

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Q.41 A source S_1 is producing 10^{15} photons per second of wavelength 5000 Å. Another source S_2 is producing 1.02×10^{15} photons per second of wavelength 5100 Å. Then, (power of S_2)/(power of S_1) is equal to [AIPMT 2010 (Prelims)]

(1) 1.00 (2) 1.02 (3) 1.04 (4) 0.98

Scan or tap for the full solution

Q.42 The potential difference that must be applied to stop the fastest photoelectrons emitted by a nickel surface, having work function 5.01 eV, when ultraviolet light of 200 nm falls on it, must be [AIPMT 2010 (Prelims)]

(1) 2.4 V (2) −1.2 V (3) −2.4 V (4) 1.2 V

Scan or tap for the full solution

Q.43 The mass of a ^7_3Li nucleus is 0.042 u less than the sum of the masses of all its nucleons. The binding energy per nucleon of ^7_3Li nucleus is nearly [AIPMT 2010 (Prelims)]

(1) 46 MeV (2) 5.6 MeV
(3) 3.9 MeV (4) 23 MeV

Scan or tap for the full solution

Q.44 The energy of a hydrogen atom in the ground state is −13.6 eV. The energy of a He^+ ion in the first excited state will be [AIPMT 2010 (Prelims)]

(1) −13.6 eV (2) −27.2 eV
(3) −54.4 eV (4) −6.8 eV

Scan or tap for the full solution

Q.45 The energy of a hydrogen atom in the ground state is −13.6 eV. The energy of a He^+ ion in the first excited state will be [AIPMT 2010 (Prelims)]

(1) −13.6 eV (2) −27.2 eV
(3) −54.4 eV (4) −6.8 eV

Scan or tap for the full solution

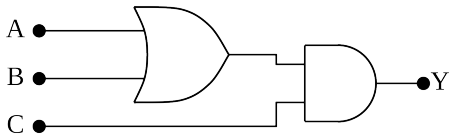
Q.46 An alpha nucleus of energy $\frac{1}{2}mv^2$ bombards a heavy nuclear target of charge Ze. Then the distance of closest approach for the alpha nucleus will be proportional to [AIPMT 2010 (Prelims)]

(1) $\frac{1}{Ze}$ (2) v^2 (3) $\frac{1}{m}$ (4) $\frac{1}{v^4}$

Scan or tap for the full solution

Q.47 To get an output Y = 1 in given circuit which of the following input will be correct?

[AIPMT 2010 (Prelims)]



(1) A ⟶ 1, B ⟶ 0, C ⟶ 0
(2) A ⟶ 1, B ⟶ 0, C ⟶ 1
(3) A ⟶ 1, B ⟶ 1, C ⟶ 0
(4) A ⟶ 0, B ⟶ 1, C ⟶ 0

Scan or tap for the full solution

Q.48 Which one of the following statements is false?

[AIPMT 2010 (Prelims)]

(1) Pure Si doped with trivalent impurities gives a p-type semiconductor.
(2) Majority carriers in a n-type semiconductor are holes.
(3) Minority carriers in a p-type semiconductor are electrons.
(4) The resistance of intrinsic semiconductor decreases with increase of temperature.

Scan or tap for the full solution

Q.49 Which one of the following bonds produces a solid that reflects light in the visible region and whose electrical conductivity decreases with temperature and has high melting point? [AIPMT 2010 (Prelims)]

(1) metallic bonding
(2) van der Waals' bonding
(3) ionic bonding
(4) covalent bonding

Scan or tap for the full solution

Q.50 The device that can act as a complete electronic circuit is [AIPMT 2010 (Prelims)]

(1) junction diode (2) integrated circuit
(3) junction transistor (4) zener diode

Scan or tap for the full solution

Q.51 The activity of a radioactive sample is measured as N_0 counts per minute at t = 0 and N_0/e counts per minute at t = 5 minutes. The time (in minutes) at which the activity reduces to half its value is

[AIPMT 2010 (Prelims)]

(1) $\log_e \frac{2}{5}$ (2) $\frac{5}{\log_e 2}$
(3) $5\log_{10} 2$ (4) $5\log_e 2$

Scan or tap for the full solution

Q.52 A common emitter amplifier has a voltage gain of 50, an input impedance of 100 Ω and an output impedance of 200 Ω. The power gain of the amplifier is [AIPMT 2010 (Prelims)]

(1) 500 (2) 1000 (3) 1250 (4) 50

Scan or tap for the full solution

Q.53 The number of atoms in 0.1 mol of a triatomic gas is ($N_A = 6.02 \times 10^{23}$ mol^{-1}) [AIPMT 2010 (Prelims)]

(1) 6.026×10^{22} (2) 1.806×10^{23}
(3) 3.600×10^{23} (4) 1.800×10^{22}

Scan or tap for the full solution

Q.54 25.3 g of sodium carbonate, Na_2CO_3 is dissolved in enough water to make 250 mL of solution. If sodium carbonate dissociates completely, molar concentration of sodium ion, Na^+ and carbonate ions, CO_3^{2-} are respectively (Molar mass of Na_2CO_3 = 106 g mol^{-1}) [AIPMT 2010 (Prelims)]

(1) 0.955 M and 1.910 M
(2) 1.910 M and 0.955 M
(3) 1.90 M and 1.910 M
(4) 0.477 M and 0.477 M

Scan or tap for the full solution

Q.55 The correct order of the decreasing ionic radii among the following isoelectronic species is

[AIPMT 2010 (Prelims)]

(1) $Ca^{2+} > K^+ > S^{2-} > Cl^-$ (2) $Cl^- > S^{2-} > Ca^{2+} > K^+$
(3) $S^{2-} > Cl^- > K^+ > Ca^{2+}$ (4) $K^+ > Ca^{2+} > Cl^- > S^{2-}$

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Q.56 Which of the following represents the correct order of increasing electron gain enthalpy with negative sign for the elements O, S, F and Cl ?

[AIPMT 2010 (Prelims)]

(1) Cl < F < O < S (2) O < S < F < Cl
(3) F < S < O < Cl (4) S < O < Cl < F

Scan or tap for the full solution

Q.57 In which of the following pairs of molecules/ ions, the central atoms have sp^2 hybridisation ?

[AIPMT 2010 (Prelims)]

(1) NO_2^- and NH_3 (2) BF_3 and NO_2^-
(3) NH_2^- and H_2O (4) BF_3 and NH_2^-

Scan or tap for the full solution

Q.58 Which one of the following species does not exist under normal conditions? [AIPMT 2010 (Prelims)]

(1) Be_2^+ (2) Be_2 (3) B_2 (4) Li_2

Scan or tap for the full solution

Q.59 In which one of the following species the central atom has the type of hybridization which is not the same as that present in the other three ? [AIPMT 2010 (Prelims)]

(1) SF_4 (2) I_3^- (3) $SbCl_5^{2-}$ (4) PCl_5

Scan or tap for the full solution

Q.60 For an endothermic reaction, energy of activation is E_a and enthalpy of reaction is ΔH (both of these in kJ/mol). Minimum value of E_a will be [AIPMT 2010 (Prelims)]

(1) less than ΔH (2) equal to ΔH
(3) more than ΔH (4) equal to zero

Scan or tap for the full solution

Q.61 Standard entropies of X_2, Y_2 and XY_3 are 60, 40 and 50 J K^{-1} mol^{-1} respectively. For the reaction

$$\frac{1}{2}X_2 + \frac{3}{2}Y_2 \rightleftharpoons XY_3,\ \Delta H = -30\text{ kJ},$$

to be at equilibrium, the temperature should be [AIPMT 2010 (Prelims)]

(1) 750 K (2) 1000 K (3) 1250 K (4) 500 K

Scan or tap for the full solution

Q.62 If pH of a saturated solution of $Ba(OH)_2$ is 12, the value of its K_{sp} is [AIPMT 2010 (Prelims)]

(1) 4.00×10^{-6} M^3 (2) 4.00×10^{-7} M^3
(3) 5.00×10^{-6} M^3 (4) 5.00×10^{-7} M^3

Scan or tap for the full solution

Q.63 What is $[H^+]$ in mol/L of a solution that is 0.20 M in CH_3COONa and 0.10 M in CH_3COOH? K_a for $CH_3COOH = 1.8 \times 10^{-5}$ [AIPMT 2010 (Prelims)]

(1) 3.5×10^{-4} (2) 1.1×10^{-5}
(3) 1.8×10^{-5} (4) 9.0×10^{-6}

Scan or tap for the full solution

Q.64 In which of the following equilibrium K_c and K_p are not equal? [AIPMT 2010 (Prelims)]

(1) $2NO(g) \rightleftharpoons N_2(g) + O_2(g)$
(2) $SO_2(g) + NO_2(g) \rightleftharpoons SO_3(g) + NO(g)$
(3) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$
(4) $2C(s) + O_2(g) \rightleftharpoons 2CO(g)$

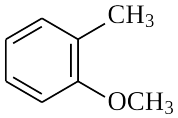
Scan or tap for the full solution

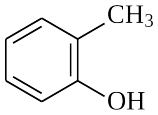
Q.65 In a buffer solution containing equal concentration of B^- and HB, the K_b for B^- is 10^{-10}. The pH of buffer solution is [AIPMT 2010 (Prelims)]

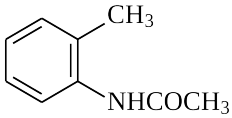
(1) 10 (2) 7 (3) 6 (4) 4

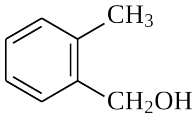
Scan or tap for the full solution

Q.66 Which one of the following is most reactive towards electrophilic reagent? [AIPMT 2010 (Prelims)]

(1) 

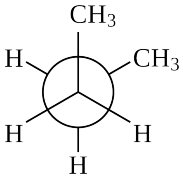
(2) 

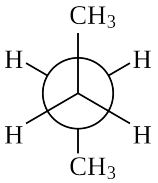
(3) 

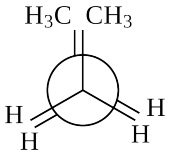
(4) 

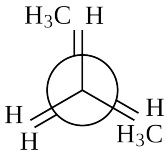
Scan or tap for the full solution

Q.67 In the following the most stable conformation of n-butane is [AIPMT 2010 (Prelims)]

(1) 

(2) 

(3) 

(4) 

Scan or tap for the full solution

Q.68 Liquid hydrocarbons can be converted to a mixture of gaseous hydrocarbons by [AIPMT 2010 (Prelims)]

(1) oxidation
(2) cracking
(3) distillation under reduced pressure
(4) hydrolysis

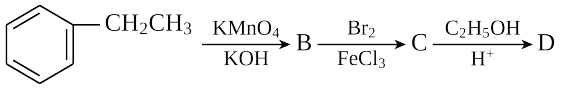
Scan or tap for the full solution

Q.69 The reaction of toluene with Cl_2 in presence of $FeCl_3$ gives X and reaction in presence of light gives Y. Thus, X and Y are [AIPMT 2010 (Prelims)]

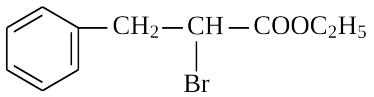
(1) X = Benzal chloride, Y = o-chlorotoluene
(2) X = m-chlorotoluene, Y = p-chlorotoluene
(3) X = o- and p-chlorotoluene, Y = Trichloromethyl benzene
(4) X = Benzyl chloride, Y = m-chlorotoluene

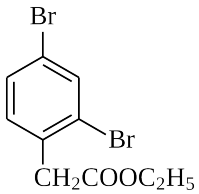
Scan or tap for the full solution

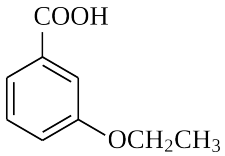
Q.70 In a set of reactions, ethylbenzene yielded a product D.

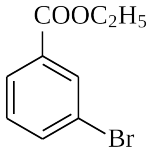


D would be [AIPMT 2010 (Prelims)]

(1) 

(2) 

(3) 

(4) 

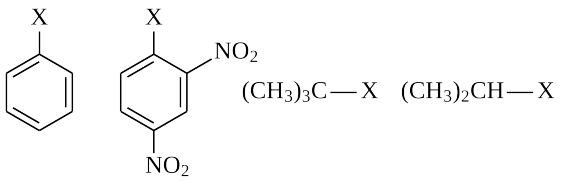
Scan or tap for the full solution

Q.71 Which one is most reactive towards S_N1 reaction? [AIPMT 2010 (Prelims)]

(1) $C_6H_5CH(C_6H_5)Br$
(2) $C_6H_5CH(CH_3)Br$
(3) $C_6H_5C(CH_3)(C_6H_5)Br$
(4) $C_6H_5CH_2Br$

Scan or tap for the full solution

Q.72 The correct order of increasing reactivity of



C–X bond towards nucleophile in the following compounds is [AIPMT 2010 (Prelims)]

(1) I < II < IV < III (2) II < III < I < IV
(3) IV < III < I < II (4) III < II < I < IV

Scan or tap for the full solution

Q.73 Given are cyclohexanol (I), acetic acid (II), 2, 4, 6-trinitrophenol (III) and phenol (IV). In these the order of decreasing acidic character will be [AIPMT 2010 (Prelims)]

(1) III > II > IV > I (2) II > III > I > IV
(3) II > III > IV > I (4) III > IV > II > I

Scan or tap for the full solution

Q.74 Among the following four compounds

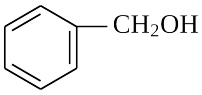
(i) Phenol (ii) Methyl phenol
(iii) Meta-nitrophenol (iv) Para-nitrophenol

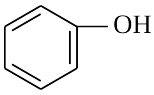
The acidity order is [AIPMT 2010 (Prelims)]

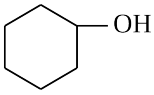
(1) (iv) > (iii) > (i) > (ii) (2) (iii) > (iv) > (i) > (ii)
(3) (i) > (iv) > (iii) > (ii) (4) (ii) > (i) > (iii) > (iv)

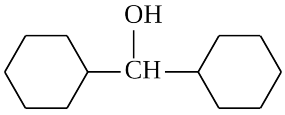
Scan or tap for the full solution

Q.75 Which of the following compounds has the most acidic nature? [AIPMT 2010 (Prelims)]

(1) 

(2) 

(3) 

(4) 

Scan or tap for the full solution

Q.76 Which of the following reactions will not result in the formation of carbon-carbon bonds? [AIPMT 2010 (Prelims)]

(1) Reimer-Tiemann reaction
(2) Cannizzaro reaction
(3) Wurtz reaction
(4) Friedel-Crafts acylation

Scan or tap for the full solution

Q.77 Acetamide is treated with the following reagents separately. Which one of these would yield methyl amine? [AIPMT 2010 (Prelims)]

(1) $NaOH/Br_2$ (2) Sodalime
(3) Hot conc. H_2SO_4 (4) PCl_5

Scan or tap for the full solution

Q.78 Among the given compounds, the most susceptible to nucleophilic attack at the carbonyl group is [AIPMT 2010 (Prelims)]

(1) CH_3COOCH_3 (2) CH_3CONH_2
(3) $CH_3COOCOCH_3$ (4) CH_3COCl

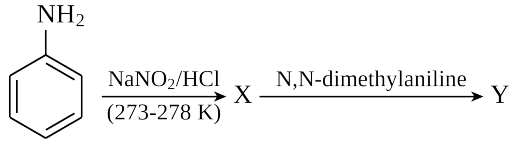
Scan or tap for the full solution

Q.79 Which of the following statements about primary amines is false? [AIPMT 2010 (Prelims)]

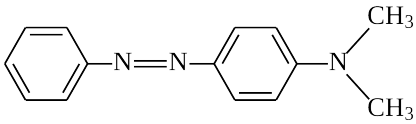
(1) Alkyl amines are stronger bases than aryl amines.
(2) Alkyl amines react with nitrous acid to produce alcohols.
(3) Aryl amines react with nitrous acid to produce phenols.
(4) Alkyl amines are stronger bases than ammonia.

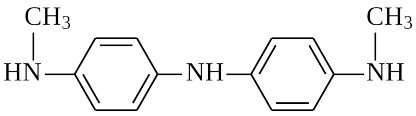
Scan or tap for the full solution

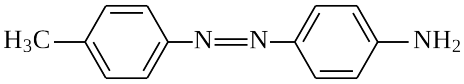
Q.80 Aniline in a set of the following reactions yielded a coloured product Y.

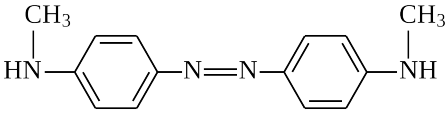


The structure of 'Y' would be [AIPMT 2010 (Prelims)]

(1) 

(2) 

(3) 

(4) 

Scan or tap for the full solution

Q.81 Which one of the following does not exhibit the phenomenon of mutarotation?

[AIPMT 2010 (Prelims)]

(1) (+) Sucrose (2) (+) Lactose
(3) (+) Maltose (4) (−) Fructose

Scan or tap for the full solution

Q.82 An aqueous solution is 1.00 molal in KI. Which change will cause the vapour pressure of the solution to increase? [AIPMT 2010 (Prelims)]

(1) Addition of NaCl
(2) Addition of Na_2SO_4
(3) Addition of 1.00 molal KI
(4) Addition of water

Scan or tap for the full solution

Q.83 A solution of sucrose (molar mass = 342 g mol^{-1}) has been prepared by dissolving 68.5 g of sucrose in 1000 g of water. The freezing point of the solution obtained will be (K_f for water = 1.86 K kg mol^{-1})

[AIPMT 2010 (Prelims)]

(1) −0.372 °C (2) −0.520 °C
(3) +0.372 °C (4) −0.570 °C

Scan or tap for the full solution

Q.84 For the reduction of silver ions with copper metal, the standard cell potential was found to be +0.46 V at 25 °C. The value of standard Gibbs energy, ΔG° will be

($F = 96500\ C\ mol^{-1}$) [AIPMT 2010 (Prelims)]

(1) −89.0 kJ (2) −89.0 J (3) −44.5 kJ (4) −98.0 kJ

Scan or tap for the full solution

Q.85 An increase in equivalent conductance of a strong electrolyte with dilution is mainly due to

[AIPMT 2010 (Prelims)]

(1) increase in ionic mobility of ions
(2) 100% ionisation of electrolyte at normal dilution
(3) increase in both i.e., number of ions and ionic mobility of ions
(4) increase in number of ions.

Scan or tap for the full solution

Q.86 For the reaction $N_2O_5(g) \longrightarrow 2NO_2(g) + \frac{1}{2}O_2(g)$ the value of rate of disappearance of N_2O_5 is given as 6.25×10^{-3} mol L^{-1} s^{-1}. The rate of formation of NO_2 and O_2 is given respectively as

[AIPMT 2010 (Prelims)]

(1) 6.25×10^{-3} mol L^{-1} s^{-1} and 6.25×10^{-3} mol L^{-1} s^{-1}
(2) 1.25×10^{-2} mol L^{-1} s^{-1} and 3.125×10^{-3} mol L^{-1} s^{-1}
(3) 6.25×10^{-3} mol L^{-1} s^{-1} and 3.125×10^{-3} mol L^{-1} s^{-1}
(4) 1.25×10^{-2} mol L^{-1} s^{-1} and 6.25×10^{-3} mol L^{-1} s^{-1}

Scan or tap for the full solution

Q.87 During the kinetic study of the reaction, $2A + B \longrightarrow C + D$, following results were obtained

Run	[A]/mol L^{-1}	[B]/mol L^{-1}	Initial rate of formation of D/mol L^{-1} min^{-1}
I.	0.1	0.1	6.0×10^{-3}
II.	0.3	0.2	7.2×10^{-2}
III.	0.3	0.4	2.88×10^{-1}
IV.	0.4	0.1	2.40×10^{-2}

Based on the above data which one of the following is correct? [AIPMT 2010 (Prelims)]

(1) Rate = $k[A]^2[B]$ (2) Rate = $k[A][B]$
(3) Rate = $k[A]^2[B]^2$ (4) Rate = $k[A][B]^2$

Scan or tap for the full solution

Q.88 Which one of the following molecular hydrides acts as a Lewis acid? [AIPMT 2010 (Prelims)]
(1) NH_3 (2) H_2O (3) B_2H_6 (4) CH_4

Scan or tap for the full solution

Q.89 The tendency of BF_3, BCl_3 and BBr_3 to behave as Lewis acid decreases in the sequence [AIPMT 2010 (Prelims)]
(1) $BCl_3 > BF_3 > BBr_3$ (2) $BBr_3 > BCl_3 > BF_3$
(3) $BBr_3 > BF_3 > BCl_3$ (4) $BF_3 > BCl_3 > BBr_3$

Scan or tap for the full solution

Q.90 Oxidation states of P in $H_4P_2O_5$, $H_4P_2O_6$, $H_4P_2O_7$ are respectively [AIPMT 2010 (Prelims)]
(1) +3, +5, +4 (2) +5, +3, +4
(3) +5, +4, +3 (4) +3, +4, +5

Scan or tap for the full solution

Q.91 The correct order of increasing bond angles in the following species is [AIPMT 2010 (Prelims)]
(1) $Cl_2O < ClO_2 < ClO_2^-$ (2) $ClO_2 < Cl_2O < ClO_2^-$
(3) $Cl_2O < ClO_2^- < ClO_2$ (4) $ClO_2^- < Cl_2O < ClO_2$

Scan or tap for the full solution

Q.92 Which of the following ions will exhibit colour in aqueous solutions? [AIPMT 2010 (Prelims)]
(1) La^{3+} (Z = 57) (2) Ti^{3+} (Z = 22) (3) Lu^{3+} (Z = 71) (4) Sc^{3+} (Z = 21)

Scan or tap for the full solution

Q.93 Which of the following ions has electronic configuration $[Ar]3d^6$?
(At. nos. Mn = 25, Fe = 26, Co = 27, Ni = 28)
[AIPMT 2010 (Prelims)]
(1) Ni^{3+} (2) Mn^{3+} (3) Fe^{3+} (4) Co^{3+}

Scan or tap for the full solution

Q.94 Which of the following pairs has the same size? [AIPMT 2010 (Prelims)]
(1) Fe^{2+}, Ni^{2+} (2) Zr^{4+}, Ti^{4+}
(3) Zr^{4+}, Hf^{4+} (4) Zn^{2+}, Hf^{4+}

Scan or tap for the full solution

Q.95 Which of the following complex ions is not expected to absorb visible light? [AIPMT 2010 (Prelims)]
(1) $[Ni(CN)_4]^{2-}$ (2) $[Cr(NH_3)_6]^{3+}$
(3) $[Fe(H_2O)_6]^{2+}$ (4) $[Ni(H_2O)_6]^{2+}$

Scan or tap for the full solution

Q.96 Crystal field stabilization energy for high spin d^4 octahedral complex is [AIPMT 2010 (Prelims)]
(1) $-1.8\ \Delta_0$ (2) $-1.6\ \Delta_0 + P$
(3) $-1.2\ \Delta_0$ (4) $-0.6\ \Delta_0$

Scan or tap for the full solution

Q.97 The existence of two different coloured complexes with the composition of $[Co(NH_3)_4Cl_2]^+$ is due to [AIPMT 2010 (Prelims)]
(1) linkage isomerism
(2) geometrical isomerism
(3) coordination isomerism
(4) ionization isomerism.

Scan or tap for the full solution

Q.98 Which one of the following complexes is not expected to exhibit isomerism? [AIPMT 2010 (Prelims)]
(1) $[Ni(NH_3)_4(H_2O)_2]^{2+}$ (2) $[Pt(NH_3)_2Cl_2]$
(3) $[Ni(NH_3)_2Cl_2]$ (4) $[Ni(en)_3]^{2+}$

Scan or tap for the full solution

Q.99 Which of the following alkaline earth metal sulphates has hydration enthalpy higher than the lattice enthalpy? [AIPMT 2010 (Prelims)]
(1) $CaSO_4$ (2) $BeSO_4$ (3) $BaSO_4$ (4) $SrSO_4$

Scan or tap for the full solution

Q.100 Property of the alkaline earth metals that increases with their atomic number [AIPMT 2010 (Prelims)]
(1) solubility of their hydroxides in water
(2) solubility of their sulphates in water
(3) ionization energy
(4) electronegativity

Scan or tap for the full solution

Q.101 Which one of the following compounds is a peroxide? [AIPMT 2010 (Prelims)]
(1) KO_2 (2) BaO_2 (3) MnO_2 (4) NO_2

Scan or tap for the full solution

Q.102 Which of the following structures represents neoprene polymer? [AIPMT 2010 (Prelims)]

(1) $\left[-CH_2-\underset{\underset{Cl}{|}}{C}=CH-CH_2-\right]_n$

(2) $\left[-CH_2-\overset{\overset{Cl}{|}}{CH}-\right]_n$

(3) $\left[-CH_2-\overset{\overset{CN}{|}}{CH}-\right]_n$

(4) $\left[-\underset{\underset{C_6H_5}{|}}{CH}-CH_2-\right]_n$

Scan or tap for the full solution

Q.103 AB crystallizes in a body centred cubic lattice with edge length 'a' equal to 387 pm. The distance between two oppositely charged ions in the lattice is [AIPMT 2010 (Prelims)]

(1) 335 pm (2) 250 pm (3) 200 pm (4) 300 pm

Scan or tap for the full solution

Q.104 Which one of the following is employed as a tranquilizer drug? [AIPMT 2010 (Prelims)]

(1) Promethazine (2) Valium
(3) Naproxen (4) Mifepristone

Scan or tap for the full solution

Q.105 Virus envelope is known as [AIPMT 2010 (Prelims)]

(1) capsid (2) virion
(3) nucleoprotein (4) core

Scan or tap for the full solution

Q.106 Single-celled eukaryotes are included in [AIPMT 2010 (Prelims)]

(1) protista (2) fungi (3) archaea (4) monera

Scan or tap for the full solution

Q.107 Some hyperthermophilic organisms that grow in highly acidic (pH 2) habitats belong to the two groups [AIPMT 2010 (Prelims)]

(1) eubacteria and archaea
(2) cyanobacteria and diatoms
(3) protists and mosses
(4) liverworts and yeasts

Scan or tap for the full solution

Q.108 One of the free-living, anaerobic nitrogen-fixer is [AIPMT 2010 (Prelims)]

(1) *Beijerinckia* (2) *Rhodospirillum*
(3) *Rhizobium* (4) *Azotobacter*

Scan or tap for the full solution

Q.109 Membrane-bound organelles are absent in [AIPMT 2010 (Prelims)]

(1) *Saccharomyces* (2) *Streptococcus*
(3) *Chlamydomonas* (4) *Plasmodium*

Scan or tap for the full solution

Q.110 Algae have cell wall made up of: [AIPMT 2010 (Prelims)]

(1) cellulose, galactans and mannans
(2) hemicellulose, pectins and proteins
(3) pectins, cellulose and proteins
(4) cellulose, hemicellulose and pectins

Scan or tap for the full solution

Q.111 Male and female gametophytes are independent and free-living in [AIPMT 2010 (Prelims)]

(1) mustard (2) castor
(3) *Pinus* (4) *Sphagnum*

Scan or tap for the full solution

Q.112 Keel is characteristic of the flowers of [AIPMT 2010 (Prelims)]

(1) gulmohur (2) *Cassia*
(3) *Calotropis* (4) bean

Scan or tap for the full solution

Q.113 Ovary is half-inferior in the flowers of [AIPMT 2010 (Prelims)]

(1) guava (2) plum (3) brinjal (4) cucumber

Scan or tap for the full solution

Q.114 The technical term used for the androecium in a flower of China rose (*Hibiscus rosa-sinensis*) is [AIPMT 2010 (Prelims)]

(1) monadelphous (2) diadelphous
(3) polyandrous (4) polyadelphous

Scan or tap for the full solution

Q.115 Photoperiodism was first characterised in [AIPMT 2010 (Prelims)]

(1) tobacco (2) potato (3) tomato (4) cotton

Scan or tap for the full solution

Q.116 The scutellum observed in a grain of wheat or maize is comparable to which part of the seed in other monocotyledons? [AIPMT 2010 (Prelims)]

(1) Cotyledon (2) Endosperm
(3) Aleurone layer (4) Plumule

Scan or tap for the full solution

Q.117 During mitosis, ER and nucleolus begin to disappear at [AIPMT 2010 (Prelims)]

(1) late prophase (2) early metaphase
(3) late metaphase (4) early prophase

Scan or tap for the full solution

Q.118 PGA as the first CO_2 fixation product was discovered in photosynthesis of [AIPMT 2010 (Prelims)]

(1) bryophyte (2) gymnosperm
(3) angiosperm (4) alga

Scan or tap for the full solution

Q.119 C_4 plants are more efficient in photosynthesis than C_3 plants due to [AIPMT 2010 (Prelims)]

(1) higher leaf area
(2) presence of larger number of chloroplasts in the leaf cells
(3) presence of thin cuticle
(4) lower rate of photorespiration

Scan or tap for the full solution

Q.120 The energy-releasing metabolic process in which substrate is oxidised without an external electron acceptor is called [AIPMT 2010 (Prelims)]

(1) glycolysis (2) fermentation
(3) aerobic respiration (4) photorespiration

Scan or tap for the full solution

Q.121 Phototropic curvature is the result of uneven distribution of [AIPMT 2010 (Prelims)]

(1) gibberellin (2) phytochrome
(3) cytokinins (4) auxin

Scan or tap for the full solution

Q.122 Coiling of garden pea tendrils around any support is an example of [AIPMT 2010 (Prelims)]

(1) thigmotaxis (2) thigmonasty
(3) thigmotropism (4) thermotaxis

Scan or tap for the full solution

Q.123 Apomictic embryos in *Citrus* arise from [AIPMT 2010 (Prelims)]

(1) synergids
(2) maternal sporophytic tissue in ovule
(3) antipodal cells
(4) diploid egg

Scan or tap for the full solution

Q.124 Transfer of pollen grains from the anther to the stigma of another flower of the same plant is called [AIPMT 2010 (Prelims)]

(1) xenogamy (2) geitonogamy
(3) karyogamy (4) autogamy

Scan or tap for the full solution

Q.125 Wind pollinated flowers are [AIPMT 2010 (Prelims)]

(1) small, brightly coloured, producing large number of pollen grains
(2) small, producing large number of dry pollen grains
(3) large producing abundant nectar and pollen
(4) small, producing nectar and dry pollen

Scan or tap for the full solution

Q.126 Which one of the following symbols and its representation, used in human pedigree analysis is correct – [AIPMT 2010 (Prelims)]

(1) □═══○ = mating between relatives
(2) □ = unaffected female
(3) ○ = unaffected male
(4) ◆ = male affected

Scan or tap for the full solution

Q.127 ABO blood groups in humans are controlled by the gene I. It has three alleles – I^A, I^B and i. Since there are three different alleles, six different genotypes are possible. How many phenotypes can occur – [AIPMT 2010 (Prelims)]

(1) One (2) Two (3) Three (4) Four

Scan or tap for the full solution

Q.128 Select the correct statement from the ones given below with respect to dihybrid cross – [AIPMT 2010 (Prelims)]

(1) Genes far apart on the same chromosome show very few recombinations
(2) Tightly linked genes on the same chromosome show very few recombinations
(3) Tightly linked genes on the same chromosome show higher recombinations
(4) Genes loosely linked on the same chromosome show similar recombinations as the tightly linked ones

Scan or tap for the full solution

Q.129 The genotype of a plant showing the dominant phenotype can be determined by – [AIPMT 2010 (Prelims)]

(1) Pedigree analysis (2) Back cross
(3) Test cross (4) Dihybrid cross

Scan or tap for the full solution

Q.130 Which one of the following cannot be explained on the basis of Mendel's Law of Dominance? [AIPMT 2010 (Prelims)]

(1) Out of one pair of factors one is dominant, and the other recessive
(2) Alleles do not show any blending and both the characters recover as such in F_2 generation
(3) The discrete unit controlling a particular character is called a factor
(4) Factors occur in pairs

Scan or tap for the full solution

Q.131 Which one of the following does not follow the central dogma of molecular biology ? [AIPMT 2010 (Prelims)]

(1) *Mucor* (2) HIV
(3) *Chlamydomonas* (4) Pea

Scan or tap for the full solution

Q.132 The one aspect which is not a salient feature of genetic code, is its being – [AIPMT 2010 (Prelims)]

(1) Specific (2) Degenerate
(3) Ambiguous (4) Universal

Scan or tap for the full solution

Q.133 Select the two correct statements out of the four (A–D) statements given below about lac operon.
The correct statements are :

A. Glucose or galactose may bind with the repressor and inactivate it
B. In the absence of lactose the repressor binds with the operator region
C. The z-gene codes for permease
D. This was elucidated by François Jacob and Jacques Monod [AIPMT 2010 (Prelims)]

(1) B and D (2) A and B (3) B and C (4) A and C

Scan or tap for the full solution

Q.134 Infectious proteins are present in – [AIPMT 2010 (Prelims)]

(1) Viroids (2) Geminiviruses
(3) Satellite viruses (4) Prions

Scan or tap for the full solution

Q.135 Breeding of crops with high levels of minerals, vitamins and proteins is called – [AIPMT 2010 (Prelims)]

(1) Biofortification (2) Biomagnification
(3) Micropropagation (4) Somatic hybridisation

Scan or tap for the full solution

Q.136 Select the correct statement from the following: [AIPMT 2010 (Prelims)]

(1) *Methanobacterium* is an aerobic bacterium found in rumen of cattle
(2) Activated sludge-sediment in settlement tanks of sewage treatment plant is a rich source of aerobic bacteria
(3) Biogas, commonly called gobar gas, is pure methane
(4) Biogas is produced by the activity of aerobic bacteria on animal waste

Scan or tap for the full solution

Q.137 A common biocontrol agent for the control of plant diseases is – [AIPMT 2010 (Prelims)]

(1) *Bacillus thuringiensis* (2) *Trichoderma*
(3) *Glomus* (4) Baculovirus

Scan or tap for the full solution

Q.138 The common nitrogen-fixer in paddy fields is – [AIPMT 2010 (Prelims)]

(1) *Azospirillum* (2) *Frankia*
(3) *Rhizobium* (4) *Oscillatoria*

Scan or tap for the full solution

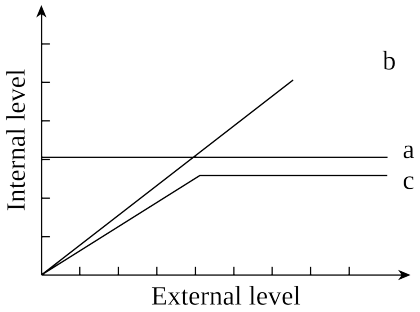
Q.139 Which one of the following is not used in organic farming ? [AIPMT 2010 (Prelims)]

(1) Earthworm (2) *Oscillatoria*
(3) Snail (4) *Glomus*

Scan or tap for the full solution

Q.140 The figure given below is a diagrammatic representation of response of organisms to abiotic factors. What do a, b and c represent respectively –

[AIPMT 2010 (Prelims)]



(1) (a) ⟶ partial regulator, (b) ⟶ regulator, (c) ⟶ conformer

(2) (a) ⟶ conformer, (b) ⟶ regulator, (c) ⟶ partial regulator

(3) (a) ⟶ regulator, (b) ⟶ conformer, (c) ⟶ partial regulator

(4) (a) ⟶ regulator, (b) ⟶ partial regulator, (c) ⟶ conformer

Scan or tap for the full solution

Q.141 Which one of the following is one of the characteristics of a biological community?

[AIPMT 2010 (Prelims)]

(1) Mortality (2) Sex-ratio

(3) Stratification (4) Natality

Scan or tap for the full solution

Q.142 The biomass available for consumption by the herbivores and the decomposers is called –

[AIPMT 2010 (Prelims)]

(1) Standing crop

(2) Net primary productivity

(3) Gross primary productivity

(4) Secondary productivity

Scan or tap for the full solution

Q.143 Study the four statements (a–d) given below and select the two correct ones out of them –

(a) A lion eating a deer and a sparrow feeding on grain are ecologically similar in being consumers

(b) Predator starfish *Pisaster* helps in maintaining species diversity of some invertebrates

(c) Predators ultimately lead to the extinction of prey species

(d) Production of chemicals such as nicotine, strychnine by the plants are metabolic disorders

The two correct statements are –

[AIPMT 2010 (Prelims)]

(1) b and c (2) a and d (3) c and d (4) a and b

Scan or tap for the full solution

Q.144 Which one of the following is an example of ex situ conservation ? [AIPMT 2010 (Prelims)]

(1) Sacred groves (2) Wildlife sanctuary

(3) National park (4) Seed bank

Scan or tap for the full solution

Q.145 Heartwood differs from sapwood in –

[AIPMT 2010 (Prelims)]

(1) Having dead and non-conducting elements

(2) Being susceptible to pests and pathogens

(3) Presence of rays and fibres

(4) Absence of vessels and parenchyma

Scan or tap for the full solution

Q.146 Which one of the following is not a lateral meristem ? [AIPMT 2010 (Prelims)]

(1) Interfascicular cambium

(2) Intercalary meristem

(3) Intrafascicular cambium

(4) Phellogen

Scan or tap for the full solution

Q.147 The chief water conducting elements of xylem in gymnosperms are : [AIPMT 2010 (Prelims)]

(1) Fibres (2) Transfusion tissue

(3) Vessels (4) Tracheids

Scan or tap for the full solution

Q.148 The plasma membrane consists mainly of –

[AIPMT 2010 (Prelims)]

(1) proteins embedded in a carbohydrate bilayer

(2) phospholipids embedded in a protein bilayer

(3) proteins embedded in a phospholipid bilayer

(4) proteins embedded in a polymer of glucose molecules

Scan or tap for the full solution

Q.149 The main area of various types of activities of a cell is – [AIPMT 2010 (Prelims)]

(1) Cytoplasm (2) Plasma membrane

(3) Nucleus (4) Mitochondrion

Scan or tap for the full solution

Q.150 Which one of the following has its own DNA? [AIPMT 2010 (Prelims)]

(1) Dictyosome (2) Mitochondria
(3) Peroxisome (4) Lysosome

Scan or tap for the full solution

Q.151 Which one of the following structures between two adjacent cells is an effective transport pathway? [AIPMT 2010 (Prelims)]

(1) Endoplasmic reticulum
(2) Plasmodesmata
(3) Plasmalemma
(4) Plastoquinones

Scan or tap for the full solution

Q.152 Which stages of cell division do the following figures A and B represent respectively? [AIPMT 2010 (Prelims)]

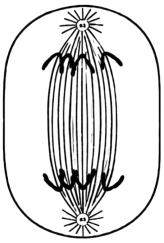


Fig. A

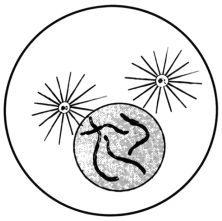


Fig. B

(1) A ⟶ Prophase, B ⟶ Anaphase
(2) A ⟶ Metaphase, B ⟶ Telophase
(3) A ⟶ Telophase, B ⟶ Metaphase
(4) A ⟶ Late anaphase, B ⟶ Prophase

Scan or tap for the full solution

Q.153 An element playing important role in nitrogen fixation is [AIPMT 2010 (Prelims)]

(1) molybdenum (2) copper
(3) manganese (4) zinc

Scan or tap for the full solution

Q.154 Which one of the following is not a micronutrient? [AIPMT 2010 (Prelims)]

(1) Molybdenum (2) Magnesium
(3) Zinc (4) Boron

Scan or tap for the full solution

Q.155 A renewable exhaustible natural resource is – [AIPMT 2010 (Prelims)]

(1) Forest (2) Minerals
(3) Coal (4) Petroleum

Scan or tap for the full solution

Q.156 dB is a standard abbreviation used for the quantitative expression of – [AIPMT 2010 (Prelims)]

(1) the dominant Bacillus in a culture
(2) the density of bacteria in a medium
(3) a certain pesticide
(4) a particular pollutant

Scan or tap for the full solution

Q.157 The two gases making highest relative contribution to the greenhouse gases are – [AIPMT 2010 (Prelims)]

(1) CFCs and N_2O (2) CO_2 and N_2O
(3) CO_2 and CH_4 (4) CH_4 and N_2O

Scan or tap for the full solution

Q.158 One example of animals having a single opening to the outside that serves both as mouth as well as anus is [AIPMT 2010 (Prelims)]

(1) *Octopus* (2) *Asterias* (3) *Ascidia* (4) *Fasciola*

Scan or tap for the full solution

Q.159 Which one of the following statements about all the four of *Spongilla*, leech, dolphin and penguin is correct? [AIPMT 2010 (Prelims)]

(1) Penguin is homoiothermic while the remaining three are poikilothermic.
(2) Leech is a fresh water form while all others are marine.
(3) *Spongilla* has special collared cells called choanocytes, not found in the remaining three.
(4) All are bilaterally symmetrical.

Scan or tap for the full solution

Q.160 Which one of the following kinds of animals are triploblastic? [AIPMT 2010 (Prelims)]

(1) Flatworms (2) Sponges
(3) Ctenophores (4) Corals

Scan or tap for the full solution

Q.161 Which one of the following statements about certain given animals is correct? [AIPMT 2010 (Prelims)]

(1) Roundworms (Aschelminthes) are pseudocoelomates
(2) Molluscs are acoelomates
(3) Insects are pseudocoelomates
(4) Flatworms (Platyhelminthes) are coelomates

Scan or tap for the full solution

Q.162 Listed below are four respiratory capacities (i – iv) and four jumbled respiratory volumes of a normal human adult.

	Respiratory capacities	Respiratory volumes
(i)	Residual volume	2500 mL
(ii)	Vital capacity	3500 mL
(iii)	Inspiratory reserve volume	1200 mL
(iv)	Inspiratory capacity	4500 mL

Which one of the following is the correct matching of two capacities and volumes?

[AIPMT 2010 (Prelims)]

(1) (ii) 2500 mL, (iii) 4500 mL
(2) (iii) 1200 mL, (iv) 2500 mL
(3) (iv) 3500 mL, (i) 1200 mL
(4) (i) 4500 mL, (ii) 3500 mL

Scan or tap for the full solution

Q.163 What is true about RBCs in humans?

[AIPMT 2010 (Prelims)]

(1) They carry about 20-25 percent of CO_2.
(2) They transport 99.5 percent of O_2.
(3) They transport about 80 percent oxygen only and the rest 20 percent of it is transported in dissolved state in blood plasma.
(4) They do not carry CO_2 at all.

Scan or tap for the full solution

Q.164 If due to some injury the chordae tendineae of the tricuspid valve of the human heart is partially non-functional, what will be the immediate effect?

[AIPMT 2010 (Prelims)]

(1) The flow of blood into the aorta will be slowed down
(2) The 'pacemaker' will stop working
(3) The blood will tend to flow back into the left atrium
(4) The flow of blood into the pulmonary artery will be reduced

Scan or tap for the full solution

Q.165 Which two of the following changes (i – iv) usually tend to occur in the plain dwellers when they move to high altitudes (3,500 m or more)?

(i) Increase in red blood cell size
(ii) Increase in red blood cell production
(iii) Increased breathing rate
(iv) Increase in thrombocyte count

Changes occurring are [AIPMT 2010 (Prelims)]

(1) (ii) and (iii) (2) (iii) and (iv)
(3) (i) and (iv) (4) (i) and (ii)

Scan or tap for the full solution

Q.166 Which one of the following statements in regard to the excretion by the human kidneys is correct?

[AIPMT 2010 (Prelims)]

(1) Descending limb of loop of Henle is impermeable to water.
(2) Distal convoluted tubule is incapable of reabsorbing HCO_3^-.
(3) Nearly 99 per cent of the glomerular filtrate is reabsorbed by the renal tubules.
(4) Ascending limb of loop of Henle is impermeable to electrolytes.

Scan or tap for the full solution

Q.167 The principal nitrogenous excretory compound in humans is synthesised [AIPMT 2010 (Prelims)]

(1) in kidneys but eliminated mostly through liver
(2) in kidneys as well as eliminated by kidneys
(3) in liver and also eliminated by the same through bile
(4) in the liver, but eliminated mostly through kidneys

Scan or tap for the full solution

Q.168 Which one of the following is the correct description of a certain part of a normal human skeleton? [AIPMT 2010 (Prelims)]

(1) Parietal bone and the temporal bone of the skull are joined by fibrous joint.
(2) First vertebra is axis which articulates with the occipital condyles.
(3) The 9th and 10th pairs of ribs are called the floating ribs.
(4) Glenoid cavity is a depression to which the thigh bone articulates.

Scan or tap for the full solution

Q.169 The nerve centres which control the body temperature and the urge for eating are contained in

[AIPMT 2010 (Prelims)]

(1) hypothalamus (2) pons
(3) cerebellum (4) thalamus

Scan or tap for the full solution

Q.170 Injury to adrenal cortex is not likely to affect the secretion of which one of the following?

[AIPMT 2010 (Prelims)]

(1) Aldosterone
(2) Both androstenedione and dehydroepiandrosterone
(3) Adrenaline
(4) Cortisol

Scan or tap for the full solution

Q.171 Low Ca^{++} in the body fluid may be the cause of [AIPMT 2010 (Prelims)]

(1) tetany (2) anaemia
(3) angina pectoris (4) gout

Scan or tap for the full solution

Q.172 Which one of the following pairs is incorrectly matched? [AIPMT 2010 (Prelims)]

(1) Glucagon – Beta cells (source)
(2) Somatostatin – Delta cells (source)
(3) Corpus luteum – Relaxin (secretion)
(4) Insulin – Diabetes mellitus (disease)

Scan or tap for the full solution

Q.173 Toxic agents present in food which interfere with thyroxine synthesis lead to the development of [AIPMT 2010 (Prelims)]

(1) toxic goitre (2) cretinism
(3) simple goitre (4) thyrotoxicosis

Scan or tap for the full solution

Q.174 Select the correct matching of a hormone, its source and function. [AIPMT 2010 (Prelims)]

(1)

Hormone	Source	Function
Vasopressin	Posterior pituitary	Increases loss of water through urine

(2)

Hormone	Source	Function
Norepinephrine	Adrenal medulla	Increases heart beat, rate of respiration and alertness

(3)

Hormone	Source	Function
Glucagon	Beta–cells of Islets of Langerhans	Stimulates glycogenolysis

(4)

Hormone	Source	Function
Prolactin	Posterior pituitary	Regulates growth of mammary glands and milk formation in females

Scan or tap for the full solution

Q.175 Sertoli cells are found in : [AIPMT 2010 (Prelims)]

(1) ovaries and secrete progesterone
(2) adrenal cortex and secrete adrenaline
(3) seminiferous tubules and provide nutrition to germ cells
(4) pancreas and secrete cholecystokinin

Scan or tap for the full solution

Q.176 Vasa efferentia are the ductules leading from : [AIPMT 2010 (Prelims)]

(1) Testicular lobules to rete testis
(2) Rete testis to vas deferens
(3) Vas deferens to epididymis
(4) Epididymis to urethra

Scan or tap for the full solution

Q.177 Seminal plasma in human males is rich in [AIPMT 2010 (Prelims)]

(1) fructose and calcium
(2) glucose and calcium
(3) DNA and testosterone
(4) ribose and potassium

Scan or tap for the full solution

Q.178 The first movements of the foetus and appearance of hair on its head are usually observed during which month of pregnancy? [AIPMT 2010 (Prelims)]

(1) Fourth month (2) Fifth month
(3) Sixth month (4) Third month

Scan or tap for the full solution

Q.179 The second maturation division of the mammalian ovum occurs [AIPMT 2010 (Prelims)]

(1) Shortly after ovulation before the ovum makes entry into the Fallopian tube
(2) Until after the ovum has been penetrated by a sperm
(3) Until the nucleus of the sperm has fused with that of the ovum
(4) in the Graafian follicle following the first maturation division

Scan or tap for the full solution

Q.180 Which one of the following statements about human sperm is correct? [AIPMT 2010 (Prelims)]

(1) Acrosome has a conical pointed structure used for piercing and penetrating the egg, resulting in fertilisation
(2) The sperm lysins in the acrosome dissolve the egg envelope facilitating fertilisation
(3) Acrosome serves as a sensory structure leading the sperm towards the ovum
(4) Acrosome serves no particular function

Scan or tap for the full solution

Q.181 Which one of the following statements about morula in humans is correct? [AIPMT 2010 (Prelims)]
(1) It has almost equal quantity of cytoplasm as an uncleaved zygote but much more DNA
(2) It has far less cytoplasm as well as less DNA than in an uncleaved zygote
(3) It has more or less equal quantity of cytoplasm and DNA as in uncleaved zygote
(4) It has more cytoplasm and more DNA than an uncleaved zygote

Scan or tap for the full solution

Q.182 The part of Fallopian tube closest to the ovary is [AIPMT 2010 (Prelims)]
(1) Isthmus (2) Infundibulum
(3) Cervix (4) Ampulla

Scan or tap for the full solution

Q.183 In vitro fertilization is a technique that involves transfer of which one of the following into the fallopian tube? [AIPMT 2010 (Prelims)]
(1) Zygote only
(2) Embryo only, upto 8 cell stage
(3) Either zygote or early embryo upto 8 cell stage
(4) Embryo of 32 cell stage

Scan or tap for the full solution

Q.184 The permissible use of the technique amniocentesis is for [AIPMT 2010 (Prelims)]
(1) transfer of embryo into the uterus of a surrogate mother
(2) detecting any genetic abnormality
(3) detecting sex of the unborn foetus
(4) artificial insemination

Scan or tap for the full solution

Q.185 Cu ions released from copper-releasing Intra Uterine Devices (IUDs) – [AIPMT 2010 (Prelims)]
(1) increase phagocytosis of sperms
(2) prevent ovulation
(3) make uterus unsuitable for implantation
(4) suppress sperm motility

Scan or tap for the full solution

Q.186 Which one of the following palindromic base sequences in DNA can be easily cut at about the middle by some particular restriction enzyme? [AIPMT 2010 (Prelims)]
(1) 5′ —— CGTTCG —— 3′
3′ —— ATGGTA —— 5′
(2) 5′ —— GAATTC —— 3′
3′ —— CTTAAG —— 5′
(3) 5′ —— CACGTA —— 3′
3′ —— CTCAGT —— 5′
(4) 5′ —— GATATG —— 3′
3′ —— CTACTA —— 5′

Scan or tap for the full solution

Q.187 Darwin's finches are a good example of – [AIPMT 2010 (Prelims)]
(1) Convergent evolution (2) Connecting link
(3) Industrial melanism (4) Adaptive radiation

Scan or tap for the full solution

Q.188 Ringworm in humans is caused by : [AIPMT 2010 (Prelims)]
(1) Fungi (2) Viruses
(3) Bacteria (4) Nematodes

Scan or tap for the full solution

Q.189 Widal test is used for the diagnosis of – [AIPMT 2010 (Prelims)]
(1) Tuberculosis (2) Malaria
(3) Typhoid (4) Pneumonia

Scan or tap for the full solution

Q.190 Which one of the following statements is correct with respect to AIDS ? [AIPMT 2010 (Prelims)]
(1) The causative HIV retrovirus enters helper T-lymphocytes thus reducing their numbers
(2) AIDS patients are being fully cured cent per cent with proper care and nutrition
(3) The HIV can be transmitted through eating food together with an infected person
(4) Drug addicts are least susceptible to HIV infection

Scan or tap for the full solution

Q.191 Select the correct statement from the ones given below : [AIPMT 2010 (Prelims)]

(1) Cocaine is given to patients after surgery as it stimulates recovery

(2) Chewing tobacco lowers blood pressure and heart rate

(3) Barbiturates when given to criminals make them tell the truth

(4) Morphine is often given to persons who have undergone surgery as a pain killer

Scan or tap for the full solution

Q.192 Which one of the following is used as vector for cloning genes into higher organisms ? [AIPMT 2010 (Prelims)]

(1) Retrovirus

(2) *Salmonella typhimurium*

(3) *Rhizopus nigricans*

(4) Baculovirus

Scan or tap for the full solution

Q.193 DNA or RNA segment tagged with a radioactive molecule is called – [AIPMT 2010 (Prelims)]

(1) Clone (2) Probe (3) Plasmid (4) Vector

Scan or tap for the full solution

Q.194 Restriction endonucleases are enzymes which – [AIPMT 2010 (Prelims)]

(1) recognize a specific nucleotide sequence for binding of DNA ligase

(2) remove nucleotides from the ends of the DNA molecule

(3) restrict the action of the enzyme DNA polymerase

(4) make cuts at specific positions within the DNA molecule

Scan or tap for the full solution

Q.195 Stirred-tank bioreactors have been designed for – [AIPMT 2010 (Prelims)]

(1) Purification of the product

(2) Availability of oxygen throughout the process

(3) Ensuring anaerobic conditions in the culture vessel

(4) Addition of preservatives to the product

Scan or tap for the full solution

Q.196 Which of the following are used in gene cloning ? [AIPMT 2010 (Prelims)]

(1) Mesosomes (2) Nucleoids

(3) Lomasomes (4) Plasmids

Scan or tap for the full solution

Q.197 The genetically-modified (GM) brinjal in India has been developed for: [AIPMT 2010 (Prelims)]

(1) Enhancing shelf life

(2) Insect-resistance

(3) Drought-resistance

(4) Enhancing mineral content

Scan or tap for the full solution

Q.198 Genetic engineering has been successfully used for producing – [AIPMT 2010 (Prelims)]

(1) transgenic models for studying new treatments for certain cardiac disease

(2) animals like bulls for farm work as they have super power

(3) transgenic mice for testing safety of polio vaccine before use in humans

(4) transgenic Cow-Rosie which produces high fat milk for making ghee

Scan or tap for the full solution

Q.199 Some of the characteristics of Bt cotton are – [AIPMT 2010 (Prelims)]

(1) High yield and production of toxic protein crystals which kill dipteran pests

(2) High yield and resistance to bollworms

(3) Long fibre and resistance to aphids

(4) Medium yield, long fibre and resistance to beetle pests

Scan or tap for the full solution

Q.200 An improved variety of transgenic basmati rice [AIPMT 2010 (Prelims)]

(1) gives high yield but has no characteristic aroma

(2) does not require chemical fertilizers and growth hormones

(3) is completely resistant to all insect pests and diseases of paddy

(4) gives high yield and is rich in vitamin A

Scan or tap for the full solution

Q.201 The cells lining the blood vessels belong to the category of : [AIPMT 2010 (Prelims)]

(1) Columnar epithelium
(2) Connective tissue
(3) Smooth muscle tissue
(4) Squamous epithelium

Scan or tap for the full solution

Q.202 Carrier ions like Na^+ facilitate the absorption of substances like [AIPMT 2010 (Prelims)]
(1) amino acids and glucose
(2) glucose and fatty acids
(3) fatty acids and glycerol
(4) fructose and some amino acids

Scan or tap for the full solution

Q.203 If for some reason our goblet cells are nonfunctional, this will adversely affect [AIPMT 2010 (Prelims)]
(1) production of somatostatin
(2) secretion of sebum from the sebaceous glands
(3) maturation of sperms
(4) smooth movement of food down the intestine

Scan or tap for the full solution

ANSWER KEY

Ques.	1	2	3	4	5	6	7
Ans.	**2**	**1**	**1**	**2**	**3**	**3**	**1**
Ques.	8	9	10	11	12	13	14
Ans.	**4**	**4**	**2**	**3**	**3**	**2**	**2**
Ques.	15	16	17	18	19	20	21
Ans.	**2**	**1**	**3**	**1**	**1**	**4**	**3**
Ques.	22	23	24	25	26	27	28
Ans.	**4**	**3**	**4**	**4**	**4**	**2**	**2**
Ques.	29	30	31	32	33	34	35
Ans.	**1**	**1**	**2**	**3**	**4**	**2**	**2**
Ques.	36	37	38	39	40	41	42
Ans.	**4**	**3**	**3**	**3**	**4**	**1**	**2**
Ques.	43	44	45	46	47	48	49
Ans.	**2**	**1**	**1**	**3**	**2**	**2**	**1**
Ques.	50	51	52	53	54	55	56
Ans.	**2**	**4**	**3**	**2**	**2**	**3**	**2**
Ques.	57	58	59	60	61	62	63
Ans.	**2**	**2**	**3**	**3**	**1**	**4**	**4**
Ques.	64	65	66	67	68	69	70
Ans.	**4**	**4**	**2**	**2**	**2**	**3**	**4**
Ques.	71	72	73	74	75	76	77
Ans.	**3**	**1**	**1**	**1**	**2**	**2**	**1**
Ques.	78	79	80	81	82	83	84
Ans.	**4**	**3**	**1**	**1**	**4**	**1**	**1**
Ques.	85	86	87	88	89	90	91
Ans.	**1**	**2**	**4**	**3**	**2**	**4**	**4**
Ques.	92	93	94	95	96	97	98
Ans.	**2**	**4**	**3**	**1**	**4**	**2**	**3**

Ques.	99	100	101	102	103	104	105
Ans.	**2**	**1**	**2**	**1**	**1**	**2**	**1**
Ques.	106	107	108	109	110	111	112
Ans.	**1**	**1**	**2**	**2**	**1**	**4**	**4**
Ques.	113	114	115	116	117	118	119
Ans.	**2**	**1**	**1**	**1**	**1**	**4**	**4**
Ques.	120	121	122	123	124	125	126
Ans.	**2**	**4**	**3**	**2**	**2**	**2**	**1**
Ques.	127	128	129	130	131	132	133
Ans.	**4**	**2**	**3**	**2**	**2**	**3**	**1**
Ques.	134	135	136	137	138	139	140
Ans.	**4**	**1**	**2**	**2**	**1**	**3**	**3**
Ques.	141	142	143	144	145	146	147
Ans.	**3**	**2**	**4**	**4**	**1**	**2**	**4**
Ques.	148	149	150	151	152	153	154
Ans.	**3**	**1**	**2**	**2**	**4**	**1**	**2**
Ques.	155	156	157	158	159	160	161
Ans.	**1**	**4**	**3**	**4**	**3**	**1**	**1**
Ques.	162	163	164	165	166	167	168
Ans.	**3**	**1**	**4**	**1**	**3**	**4**	**1**
Ques.	169	170	171	172	173	174	175
Ans.	**1**	**3**	**1**	**1**	**3**	**2**	**3**
Ques.	176	177	178	179	180	181	182
Ans.	**2**	**1**	**2**	**2**	**2**	**1**	**2**
Ques.	183	184	185	186	187	188	189
Ans.	**3**	**2**	**4**	**2**	**4**	**1**	**3**
Ques.	190	191	192	193	194	195	196
Ans.	**1**	**4**	**1**	**2**	**4**	**2**	**4**
Ques.	197	198	199	200	201	202	203
Ans.	**2**	**3**	**2**	**4**	**4**	**1**	**4**