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SUBJECT PHYSICS

KCET EXAMINATION - 2025

VERSION B4

DR ACADEMY IS THE PERFECT DESTINATION FOR MEDICAL ASPIRANTS

THE JOURNEY... NEET MEDICAL SELECTIONS

2018	2019	2020	2021	2022	2023	2024
123	210	182	279	445	452	569

TOTAL 2260 MEDICAL SELECTIONS

in seven consecutive years. Our students joined in many reputed medical colleges across Karnataka.

NEET - 2024 | MIMS - MANDYA	657 MARKS	S SUHAS
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NEET - 2024 | GMC - SAMBHAJINAGAR	656 MARKS	PRATEEK SUBHASH TOPINATTI
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NEET - 2024 | VIMS - BELLARY	654 MARKS	NIVEDITA
NEET - 2023 | BMC, BANGALORE	654 MARKS	ABHISHEK V G
NEET - 2021 | BMC, BANGALORE	654 MARKS	KUMARESH HIREMATH
NEET - 2024 | BIMC - BELAGAVI	653 MARKS	SIDDANAGOUDA S PATIL
NEET - 2024 | KIMS - HUBLI	653 MARKS	VINDHYA B G
NEET - 2024 | BIMC - BELAGAVI	652 MARKS	BHOOMIKA BAYAKOL
NEET - 2024 | VIMS - BELLARY	652 MARKS	CHIRANTHAN J
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NEET-2022 | BMC, BANGALORE	650 MARKS	SANKALP
NEET-2022 | KIMS, HUBLI	650 MARKS	ABHIJIT RAMESH MIRJI
NEET - 2024 | VIMS - BELLARY	649 MARKS	KEERTI VEERANNA KORI
NEET - 2024 | VIMS - BELLARY	648 MARKS	SONIYA S
NEET - 2024 | BMC - BANGALORE	647 MARKS	NAVYA
NEET - 2024 | BIMC - BELAGAVI	647 MARKS	SIDDANAGOUDA PATIL
NEET - 2024 | BIMC - BELAGAVI	647 MARKS	OMKAR N MUDENUR
NEET-2024 | MIMS - MANDYA	647 MARKS	VIJAY KUMAR B DEYANNAVAR
NEET-2022 | BMC, BANGALORE	647 MARKS	SUPRIT SAMJAY K
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NEET-2024 | VIMS - BELLARY	646 MARKS	VENKATESH REDDY
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NEET-2024 | BIMC - BELAGAVI	645 MARKS	CHANDANA B
NEET-2024 | GIMS - GADAG	645 MARKS	SHASHANK CHANDRA SHEKHAR KANDAGAL
NEET-2024 | MIMS - MANDYA	645 MARKS	PRASHANTGOUDA MENASAGI
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NEET-2024 | MIMS - MANDYA	644 MARKS	SANJANA R
NEET-2023 | MMCRI, MYSORE	643 MARKS	VISHAL S PATIL
NEET-2022 | BMC, BANGALORE	643 MARKS	VAISHNAVI REDDY
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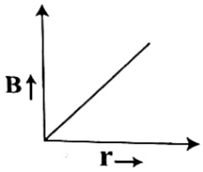
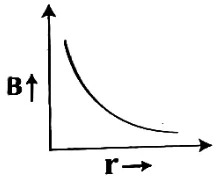
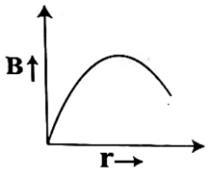
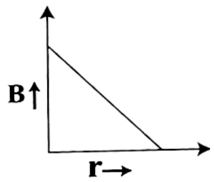
1. Which of the following graphs represents the variation of magnetic field B with perpendicular distance 'r' from an infinitely long, straight conductor carrying current?

1) 

2) 

3) 

4) 

Ans. 2

Sol. $B = \frac{\mu_0 i}{2\pi r}$

$\Rightarrow B \propto \frac{1}{r}$

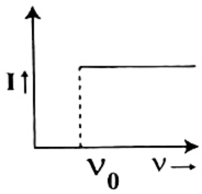
2. If we consider an electron and a photon of same de-Broglie wavelength, then they will have same
1) Angular momentum 2) Energy
3) Velocity 4) Momentum

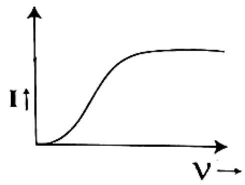
Ans. 4

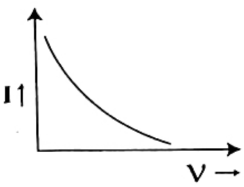
Sol. $\lambda = \frac{h}{P}$

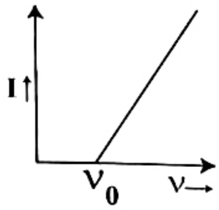
λ is same for both hence P is same for both

3. The anode voltage of a photocell is kept fixed. The frequency of the light falling on the cathode is gradually increased. Then the correct graph which shows the variation of photo current I with the frequency υ of incident light is

1) 

2) 

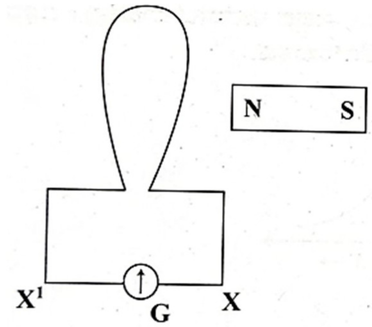
3) 

4) 

Ans. 1

Sol. Photo current is independent of frequency of incident radiation.

4. When a bar magnet is pushed towards the coil, along its axis, as shown in the figure, the galvanometer pointer deflects towards X. When this magnet is pulled away from the coil, the galvanometer pointer



1) deflects towards X^1 2) does not deflect
3) oscillates 4) deflects towards X

Ans. 1

Sol. According to Lenz's law

5. A square loop of side 2m lies in the Y-Z plane in a region having a magnetic field $\vec{B} = (5\hat{i} + 3\hat{j} - 4\hat{k})T$. The magnitude of magnetic flux through the square loop is
1) 20 Wb 2) 12 Wb 3) 16 Wb 4) 10 Wb

Ans. 1

Sol. $\phi = B_x A = 5 \times 4 = 20\,Wb$

Area, $A = l \times b = 2 \times 2 = 4m^2$

6. In domestic electric mains supply, the voltage and the current are
1) AC voltage and DC current
2) DC voltage and DC current
3) DC voltage and AC current
4) AC voltage and AC current

Ans. 4

Sol. AC voltage and AC current

7. A sinusoidal voltage produced by an AC generator at any instant t is given by an equation $V = 311 \sin 314t$. The rms value of voltage and frequency are respectively.
1) 200 V, 50 Hz 2) 220 V, 100 Hz
3) 220 V, 50 Hz 4) 200 V, 100 Hz

Ans. 3

Sol. $V_{rms} = \frac{V_0}{\sqrt{2}} = \frac{311}{1.414} = 220$

$\omega = 314$

$2\pi n = 314$

$n = \frac{314}{2 \times 3.14} = 50$ Hz

8. A series LCR circuit containing an AC source of 100 V has an inductor and a capacitor of reactance 24Ω and 16Ω respectively. If a resistance of 6Ω is connected in series, then the potential difference across the series combination of inductor and capacitor only is

1) 80 V 2) 400 V 3) 8 V 4) 40 V

Ans. 1

Sol. $V = 100\,V$

$X_L = 24\Omega$

$X_C = 16\Omega$

$R = 6\Omega$

$$I = \frac{V}{Z} = \frac{100}{\sqrt{R^2 + (X_L - X_C)^2}}$$

$$I = \frac{100}{\sqrt{6^2 + 8^2}} = \frac{100}{10} = 10A$$

$V_L = iX_L = 10 \times 24 = 240V$

$V_C = iX_C = 10 \times 16 = 160V$

Voltage across L and C is

$V^1 = 240 - 160 = 80$ volts

9. Match the following types of waves with their wavelength ranges

Waves		Wavelength ranges	
i.	Microwave	a.	700 nm to 400 nm
ii.	Visible light	b.	1 nm to 10^{-3} nm
iii.	Ultraviolet	c.	0.1 m to 1 mm
iv.	X-rays	d	400 nm to 1nm

1) i - c, ii - a, iii - d, iv - b
2) i - d, ii - b, iii - c, iv - a
3) i - b, ii - c, iii - a, iv - d
4) i - a, ii - d, iii - b, iv - c

Ans. 1

Sol. Conceptual

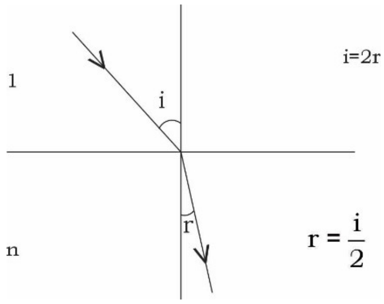
10. A ray of light passes from vacuum into a medium of refractive index n. If the angle of incidence is twice the angle of refraction, then the angle of incidence in terms of refractive index is

1) $\sin^{-1}\left(\frac{n}{2}\right)$ 2) $2\cos^{-1}\left(\frac{n}{2}\right)$

3) $2\sin^{-1}\left(\frac{n}{2}\right)$ 4) $\cos^{-1}\left(\frac{n}{2}\right)$

Ans. 2

Sol.



$$1\sin i = n\sin\frac{i}{2}$$

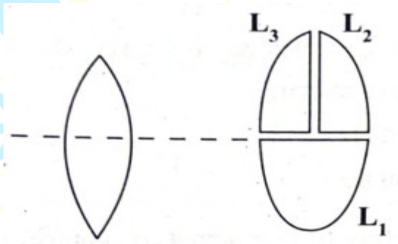
$$2\sin\frac{i}{2}\cos\frac{i}{2} = n\sin\frac{i}{2}$$

$$\cos\frac{i}{2} = \frac{n}{2}$$

$$\frac{i}{2} = \cos^{-1}\left(\frac{n}{2}\right)$$

$$i = 2\cos^{-1}\left(\frac{n}{2}\right)$$

11. A convex tens has power P. It is cut into two halves along its principal axis. Further one piece (out of two halves) is cut into two halves perpendicular to the principal axis as shown in figure.
Choose the incorrect option for the reported lens pieces



1) Power of L_2 is $\frac{P}{2}$ 2) Power of L_3 is $\frac{P}{2}$

3) Power of L_1 is P 4) Power of L_1 is $\frac{P}{2}$

Ans. 4

Sol. Power of L_1 is $\frac{1}{f} = P$

Power of L_2 and L_3 is $\frac{P}{2}$

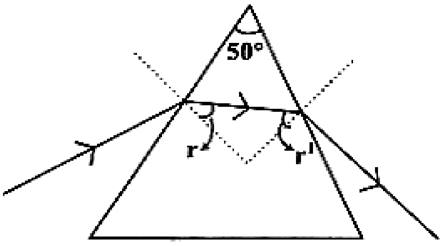
12. The image formed by an objective lens a compound microscope is

1) Real and diminished
2) Real and enlarged
3) Virtual and enlarged
4) Virtual and diminished

Ans. 2

Sol. Real, enlarged image

13. If r and r' denote the angles inside the prism having angle of prism 50^0 considering that during interval of time from $t = 0$ to $t = t$, r varies with time as $r = 10^0 + t^2$. During this time r' will vary with time as



1) $40^0 + t^2$ 2) $50^0 - t^2$ 3) $50^0 + t^2$ 4) $40^0 - t^2$

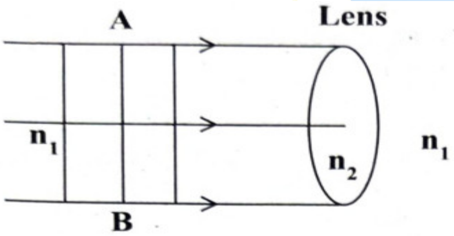
Ans. 4

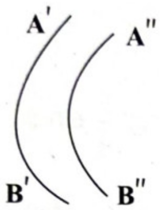
Sol. $r' = A - (10 + t^2)$

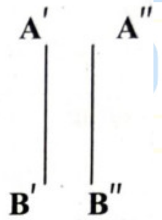
$r' = 50 - 10 - t^2$

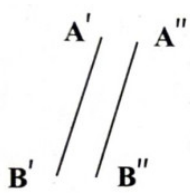
$r' = 40 - t^2$

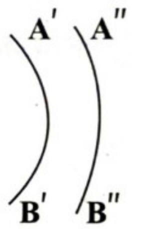
14. If AB is incident plane wave front then refracted wave front is $(n_2 > n_1)$



1) 

2) 

3) 

4) 

Ans. 1

Sol. It converts as spherical wave front and converges towards focus

15. The total energy carried by the light wave when it travels from a rarer to a non-reflecting and non-absorbing medium

1) remains same
2) increases
3) either increases or decreases depending upon angle of incidence
4) decreases

Ans. 1

Sol. Total energy remains same

16. If the radius of first Bohr orbit is r, then the radius of the second Bohr orbit will be

1) 8r 2) 4r 3) $2\sqrt{2}r$ 4) 2r

Ans. 2

Sol. $r_n = r\dfrac{n^2}{Z} = r\dfrac{2^2}{1} = 4r$

17. Match the following types of nuclei with examples shown

Column-I		Column- II	
(A)	Isotopes	(i)	${}_3Li^7, {}_4Be^7$
(B)	Isobars	(ii)	${}_8O^{18}, {}_9F^{19}$
(C)	Isotones	(iii)	${}_1H^1, {}_1H^2$

1) A - ii, B - iii, C – i 2) A – i, B – iii, C - ii
3) A – iii, B – ii, C – i 4) A-iii, B-i, C-ii

Ans. 4

Sol. Isotopes (Z= same, same element) = ${}_1H^1, {}_1H^2$

Isobars (A=same, different elements)

$= {}_3Li^7, {}_4Be^7$

Isotones (n=A-Z =same, different elements)

$= {}_8O^{18}, {}_9F^{19}$

18. Which of the following statements is incorrect with reference to 'Nuclear force'?

1) Nuclear force becomes attractive for nucleon distances larger than 0.8 fm
2) Nuclear force becomes repulsive for nucleon distances less than 0.8 fm
3) Nuclear force is always attractive
4) Potential energy is minimum, if the separation between the nucleons is 0.8 fm

Ans. 3

Sol. Conceptual

19. The range of electrical conductivity (σ) and resistivity (ρ) for metals, among the following, is

1) $\rho \to 10^{-5} - 10^{6}\,\Omega\text{ m}$, $\sigma \to 10^{-5} - 10^{-6}\,\text{Sm}^{-1}$
2) $\rho \to 10^{11} - 10^{19}\,\Omega\text{ m}$, $\sigma \to 10^{-11} - 10^{-19}\,\text{Sm}^{-1}$
3) $\rho \to 10^{2} - 10^{8}\,\Omega\text{ m}$, $\sigma \to 10^{-2} - 10^{-8}\,\text{Sm}^{-1}$
4) $\rho \to 10^{-2} - 10^{-8}\,\Omega\text{ m}$, $\sigma \to 10^{2} - 10^{8}\,\text{Sm}^{-1}$

Ans. 4

Sol. For Metals or conductors,
Conductivity is high $\sigma = 10^2 \text{ to} 10^8\,\text{Sm}^{-1}$
Resistivity is low $\rho = 10^{-2} \text{ to} 10^{-8}\,\Omega\text{m}$

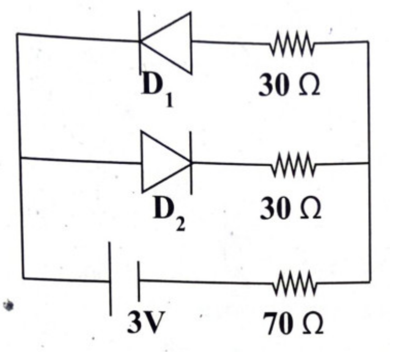
20. Which of the following statements is correct for an n-type semiconductor?

1) The donor energy level lies closely above the top of the valence band
2) The donor energy level lies at the half way mark of forbidden energy gap
3) The donor energy level does not exist
4) The donor energy level just below the bottom of the conduction band

Ans. 4

Sol. In n – type semiconductor, donor energy level lies just below the bottom of conduction band

21. The circuit shown in the figure contains two ideal diodes D_1 and D_2. If a cell of emf 3V and negligible internal resistance is connected as shown, then the current through 70Ω resistance (in ampere) is



1) 0.01 2) 0.02 3) 0.03 4) 0

Ans. 3

Sol. $I = \dfrac{V}{R_{eff}} = \dfrac{3}{70+30} = 0.03\,\text{A}$

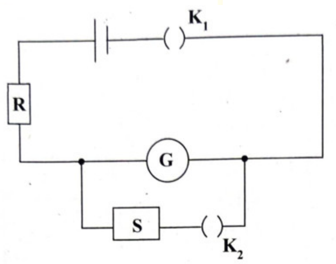
22. In determining the refractive index of a glass slab using a travelling microscope, the following readings are tabulated.
(A) Reading of travelling microscope for ink mark $= 5.123$ cm
(B) Reading of travelling microscope for ink mark through glass slab $= 6.123$ cm
(C) Reading of travelling microscope for chalk dust on glass slab $= 8.123$ cm
From the data, the refractive index of a glass slab is

1) 1.500 2) 1.601 3) 1.399 4) 1.390

Ans. 1

Sol. $n = \dfrac{R_3 - R_1}{R_3 - R_2} = \dfrac{8.123 - 5.123}{8.123 - 6.123} = \dfrac{3}{2} = 1.5$

23. In an experiment to determine the figure of merit of a galvanometer by half deflection method, a student constructed the following circuit.



He unplugged a resistance of 5200Ω in R. When K_1 is closed and K_2 is open, the deflection observed in the galvanometer is 26 div. When K_2 is also closed and a resistance of 90Ω is removed in S, the deflection becomes 13 div. The resistance of galvanometer is nearly

1) 45.0Ω 2) 103.0Ω
3) 91.6Ω 4) 116.0Ω

Ans. 3

Sol. $G = \dfrac{RS}{R-S} = \dfrac{5200 \times 90}{5200 - 90} = 91.5\Omega$

24. While determining the coefficient of viscosity of the given liquid, a spherical steel ball sinks by a distance $h = 0.9$ m. The radius of the ball is $r = \sqrt{3} \times 10^{-3}$ m. The time taken by the ball to sink in three trials are tabulated as follows.

Trial No.	Time taken by the ball to fall by h (in second)
1.	2.75
2.	2.65
3.	2.70

The difference between the densities of the steel ball and the liquid is 7000 kg m^{-3}. If $g = 10.0 \text{ ms}^{-2}$, then the coefficient of viscosity of the given liquid at room temperature is

1) 0.14 Pa.s
2) 0.14×10^{-3} Pa.s
3) 14 Pa.s
4) 0.28 Pa.s

Ans. **1**

Sol. $\eta = \frac{2}{9}\frac{r^2 g(\rho - \sigma)}{V}$

$\eta = \frac{2}{9} \times \frac{3 \times 10^{-6} \times 10 \times 7000}{1/3}$

$\eta = 0.14$

25. Which of the following expressions can be deduced on the basis of dimensional analysis? (All symbols have their usual meanings)

1) $x = A\cos\omega t$
2) $N = N_0 e^{-\lambda t}$
3) $F = 6\pi\eta rv$
4) $s = ut + \frac{1}{2}at^2$

Ans. **3**

Sol. Dimensional analysis is not applicable for trigonometric and exponential functions

26. Two stones begin to fall from rest from the same height, with the second stone starting to fall 'Δt' seconds after the first falls from rest. The distance of separation between the two stones becomes 'H', 't_0' seconds after the first stone starts its motion. Then t_0 is equal to

1) $\frac{H}{\Delta t} + \frac{\Delta t}{2g}$
2) $\frac{H}{g\Delta t} - \frac{\Delta t}{2}$
3) $\frac{H}{g\Delta t} + \frac{\Delta t}{2}$
4) $\frac{H}{g\Delta t}$

Ans. **3**

Sol. Case (i) $x_1 = \frac{1}{2}g t_0^2$

Case (ii) $x_2 = \frac{1}{2}g(t_0 - \Delta t)^2$

Given $x_1 - x_2 = H = \frac{1}{2}g t_0^2 - \frac{1}{2}g(t_0 - \Delta t)^2$

$\Rightarrow t_0 = \frac{H}{g\Delta t} + \frac{\Delta t}{2}$

27. In the projectile motion of a particle on a level ground, which of the following remains constant with reference to time and position?

1) Average velocity between any two points on the path
2) Horizontal component of velocity
3) Angle between the instantaneous velocity with the horizontal
4) Vertical component of the velocity of the projectile

Ans. **2**

Sol. Horizontal component of velocity remains constant

28. A particle is in uniform circular motion. The equation of its trajectory is given by $(x-2)^2 + y^2 = 25$, where x and y are in meter. The speed of the particle is 2 ms^{-1}. When the particle attains the lowest ' y ' co-ordinate, the acceleration of the particle is (in ms^{-2})

1) $0.4\hat{j}$
2) $0.8\hat{i}$
3) $0.8\hat{j}$
4) $0.4\hat{i}$

Ans. **3**

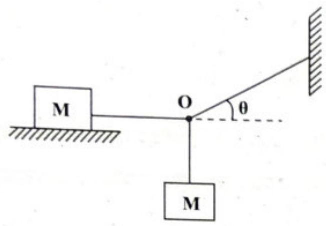
Sol. $(x-2)^2 + y^2 = 25$

Compare above equation with equation of circle $x^2 + y^2 = r^2$ then $r = 5$

$\therefore a = \frac{v^2}{r} = \frac{2^2}{5} = 0.8$

When particle attains lowest 'y' co- ordinate, acceleration particle is along x axis

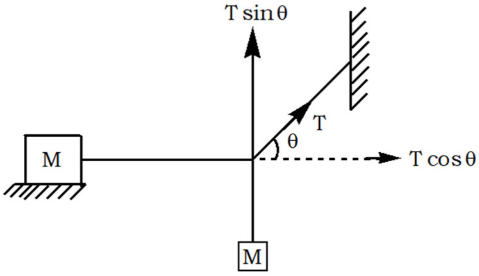
29. A wooden block of mass M lies on a rough floor. Another wooden block of the same mass is hanging from the point O through strings as shown in the figure. To achieve equilibrium, the coefficient of static friction between the block on the floor with the floor itself is



1) $\mu = \cot\theta$
2) $\mu = \sin\theta$
3) $\mu = \tan\theta$
4) $\mu = \cos\theta$

Ans. 1

Sol.



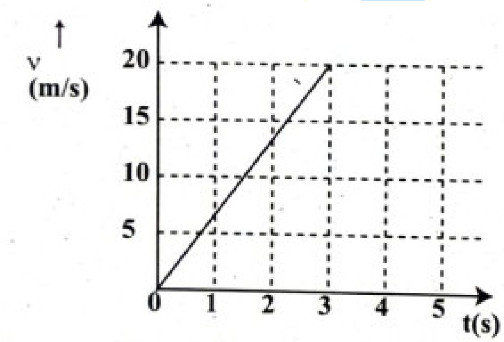
$T\sin\theta = Mg$

$T\cos\theta = \mu Mg$

$\dfrac{T\cos\theta}{T\sin\theta} = \dfrac{\mu Mg}{Mg} = \mu$

$\cot\theta = \mu$

30. A block of certain mass is placed on a rough floor. The coefficients of static and kinetic friction between the block and the floor are 0.4 and 0.25 respectively. A constant horizontal force $F = 20N$ acts on it so that the velocity of the block varies with time according to the following graph. The mass of the block is nearly (Take $g \simeq 10\ ms^{-2}$)



1) 4.4 kg   2) 1.2 kg   3) 1.0 kg   4) 2.2 kg

Ans. 4

Sol. $\mu_s = 0.4$

$\mu_k = 0.25$

Acceleration $= \dfrac{Y_2 - Y_1}{X_2 - X_1} = \dfrac{20}{3}$

$F = ma + \mu mg$

$m = \dfrac{F}{\mu g + a} = 2.18 \simeq 2.2kg$

31. A body of mass 0.25 kg travels along a straight line from $x = 0$ to $x = 2$ m with a speed $\upsilon = kx^{3/2}$ where $k = 2$ SI units. The work done by the net force during this displacement is

1) 8 J   2) 16 J   3) 32 J   4) 4 J

Ans. 4

Sol. $V = k x^{\frac{3}{2}}$

$W = \Delta K.E = \dfrac{1}{2}MV^2$

$W = \dfrac{1}{2}M.K^2x^3$

$= \dfrac{1}{2}\times 0.25 \times 4\left[2^3\right]$

$= 0.5 \times 8 = 4J$

32. During an elastic collision between two bodies, which of the following statements are correct?

I. The initial kinetic energy is equal to the final kinetic energy of the system.

II. The linear momentum is conserved.

III. The kinetic energy during Δt (the collision time) is not conserved.

1) II and III only   2) I and III only

3) I, II and III   4) I and II only

Ans. 3

Sol. Conceptual

33. Three particles of mass 1 kg, 2 kg and 3 kg are placed at the vertices A, B and C respectively of an equilateral triangle ABC of side 1 m. The centre of mass of the system from vertex A (located at origin) is

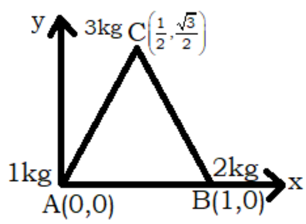
1) $\left(\dfrac{7}{12}, \dfrac{3\sqrt{3}}{12}\right)$ 2) $\left(\dfrac{9}{12}, \dfrac{3\sqrt{3}}{12}\right)$

3) $\left(\dfrac{7}{12}, \dfrac{6+3\sqrt{3}}{12}\right)$ 4) $(0,0)$

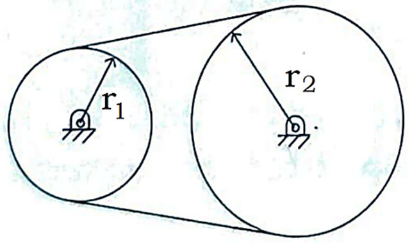
Ans. 1

Sol. $x_{cm} = \dfrac{m_1x_1 + m_2x_2 + m_3x_3}{m_1 + m_2 + m_3} = \dfrac{7}{12}m$

$y_{cm} = \dfrac{m_1y_1 + m_2y_2 + m_3y_3}{m_1 + m_2 + m_3} = \dfrac{3\sqrt{3}}{12}m$



34. Two fly wheels are connected by a non-slipping belt as shown in the figure.
$I_1 = 4\ kg\ m^2, r_1 = 20\ cm$, $I_2 = 20\ kg\ m^2$ and $r_2 = 30\ cm$. A torque of 10 Nm is applied on the smaller wheel. Then match the entries of column I with appropriate entries of column II.



I	Quantities	II	Their numerical values (in SI units)
(a)	Angular acceleration of smaller wheel	(i)	$\frac{5}{3}$
(b)	Torque on the larger wheel	(ii)	$\frac{100}{3}$
(c)	Angular acceleration of larger wheel	(iii)	$\frac{5}{2}$

1) a-ii, b-iii, c-i
2) a -iii, b-i, c-ii
3) a-ii, b-i, c-iii
4) a-iii, b-ii, c-i

Ans. 4

Sol. $r_1\omega_1 = r_2\omega_2$

$r_1\alpha_1 = r_2\alpha_2$

$10 = 4\alpha_1$

$\alpha_1 = \frac{5}{2}$

$\alpha_2 = \frac{5}{3}$ radian/sec²

$\tau_2 = 20 \times \frac{5}{3} = \frac{100}{3} N-m$

35. If r_p, v_p, L_p and r_a, v_a, L_a are radii, velocities and angular momenta of a planet at perihelion and aphelion of its elliptical orbit around the Sun respectively, then
1) $r_p > r_a, v_p > v_a, L_a > L_p$
2) $r_p < r_a, v_p > v_a, L_a = L_p$
3) $r_p > r_a, v_p < v_a, L_a = L_p$
4) $r_p < r_a, v_p < v_a, L_a < L_p$

Ans. 2

Sol. Conceptual

36. The total energy of a satellite in a circular orbit at a distance $(R+h)$ from the center of the Earth varies as
[R is the radius of the Eart and h is the height of the orbit from Earth's surface]
1) $-\frac{1}{(R+h)}$
2) $\frac{1}{(R+h)^2}$
3) $-\frac{1}{(R+h)^2}$
4) $\frac{1}{(R+h)}$

Ans. 1

Sol. $E = -\frac{GMm}{2(R+h)}$

37. Two wires A and B are made of same material. Their diameters are in the ratio of 1 : 2 and lengths are in the ratio of 1 : 3 . If they are stretched by the same force, then increase in their lengths will be in the ratio of
1) 3 : 4
2) 2 : 3
3) 3 : 2
4) 4 : 3

Ans. 4

Sol. $Y = \frac{F\ell}{Ae}$

$e \propto \frac{\ell}{A} \propto \frac{\ell}{D^2} \Rightarrow \frac{e_1}{e_2} = \frac{\ell_1}{\ell_2}\frac{D_2^2}{D_1^2} = \frac{1}{3} \times \frac{4}{1} = 4:3$

38. A horizontal pipe carries water in a streamlined flow. At a point along the pipe, where the cross-sectional area is $10\ cm^2$, the velocity of water is $1\ ms^{-1}$ and the pressure is 2000 Pa . What is the pressure of water at another point where the cross-sectional area is $5\ cm^2$?
[Density of water $= 1000 kgm^{-3}$]
1) 300 Pa
2) 400 Pa
3) 500 Pa
4) 200 Pa

Ans. 3

Sol. $A_1V_1 = A_2V_2$

$10 \times 1 = 5 \times V_2$

$V_2 = 2 m/s$

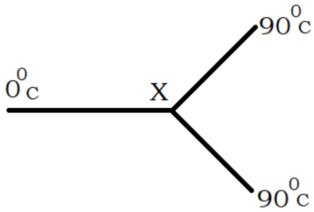
$P_1 - P_2 = \frac{1}{2}\rho\left(V_2^2 - V_1^2\right)$

$P_2 = P_1 - \frac{1}{2}\rho\left(V_2^2 - V_1^2\right)$

$P_2 = 2000 - \frac{1}{2} \times 1000 \times \left(2^2 - 1^2\right)$

$P_2 = 2000 - 1500 = 500 Pa$

39. Three metal rods of the same material and identical in all respects are joined as shown in the figure. The temperatures at the ends of these rods are maintained as indicated. Assuming no heat energy loss occurs through the curved surfaces of the rods, the temperature at the junction x is



1) $60^\circ C$ 2) $30^\circ C$ 3) $20^\circ C$ 4) $45^\circ C$

Ans. 1

Sol. $\theta - 0 + \theta - 90 + \theta - 90 = 0$

$3\theta - 180 = 0$

$\theta = 60^0 C$

40. A gas is taken from state A to state B along two different paths 1 and 2. The heat absorbed and work done by the system along these two paths are Q_1 and Q_2 and W_1 and W_2 respectively. Then

1) $W_1 = W_2$ 2) $Q_1 - W_1 = Q_2 - W_2$

3) $Q_1 + W_1 = Q_2 + W_2$ 4) $Q_1 = Q_2$

Ans. 2

Sol. ΔU is independent of the path

$\Delta U_1 = \Delta U_2$

$Q_1 - w_1 = Q_2 - w_2$

41. At $27^\circ C$ temperature, the mean kinetic energy of the atoms of an ideal gas is E_1. If the temperature is increased to $327^\circ C$, then the mean kinetic energy of the atoms will be

1) $\frac{E_1}{\sqrt{2}}$ 2) $\sqrt{2}E_1$ 3) $2E_1$ 4) $\frac{E_1}{2}$

Ans. 3

Sol. $T_1 = 27 + 273 = 300K$

$E_1 = E$

$T_2 = 327 + 273 = 600K$

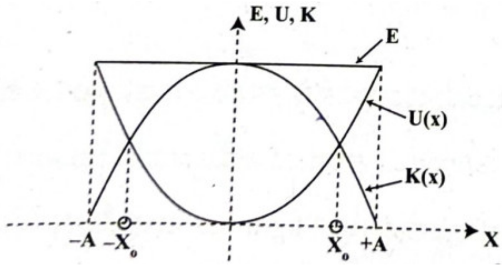
$E_2 = ?$

$KE \propto T$

$\Rightarrow \frac{E_1}{E_2} = \frac{T_1}{T_2} = \frac{300}{600} = \frac{1}{2}$

$\therefore E_2 = 2E_1$

42. The variations of kinetic energy $K(x)$, potential energy $U(x)$ and total energy as a function of displacement of a particle in SHM is as shown in the figure. The value of $|x_0|$ is



1) 2 A 2) $\frac{A}{\sqrt{2}}$ 3) $\sqrt{2}$ A 4) $\frac{A}{2}$

Ans. 2

Sol. PE = KE

$\frac{1}{2}m\omega^2x^2 = \frac{1}{2}m\omega^2\left(A^2 - x^2\right)$

$2x^2 = A^2$

$x = \frac{A}{\sqrt{2}}$

43. The angle between the particle velocity and wave velocity in a transverse wave is [except when the particle passes through the mean position]

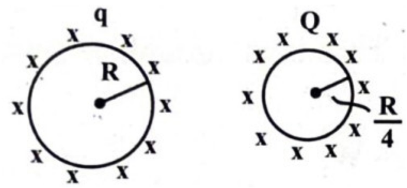
1) $\frac{\pi}{4}$ radian 2) $\frac{\pi}{2}$ radian

3) π radian 4) Zero radian

Ans. 2

Sol. From definition of transverse wave

44. A metallic sphere of radius R carrying a charge q is kept at certain distance from another metallic sphere of radius $R/4$ carrying a charge Q. What is the electric flux at any point inside the metallic sphere of radius R due to the sphere of radius $R/4$?

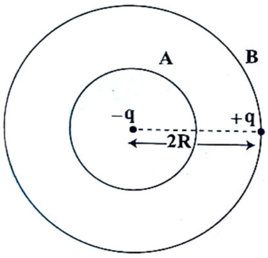


1) $\frac{Q}{\varepsilon_0} - \frac{q}{\varepsilon_0}$ 2) Zero 3) $\frac{q}{\varepsilon_0} - \frac{Q}{\varepsilon_0}$ 4) $\frac{Q}{\varepsilon_0}$

Ans. 2

Sol. From Gauss law

45. You are given a dipole of charge +q and −q separated by a distance 2R. A sphere 'A' of radius 'R' passes through the centre of the dipole as shown below and another sphere 'B' of radius '2R' passes through the charge +q. Then the electric flux through the sphere A is



1) q/ε_0 2) Zero 3) $2q/\varepsilon_0$ 4) $-q/\varepsilon_0$

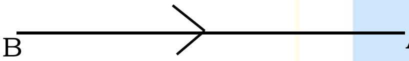
Ans. 4

Sol. $\phi = \frac{-q}{\varepsilon_0}$ (flux is inwards)

46. A potential at a point A is -3 V and that at another point B is 5V. What is the work done in carrying a charges of 5 m C from B to A?

1) -0.04 J 2) -0.4 J 3) -4 J 4) -40 J

Ans. 1

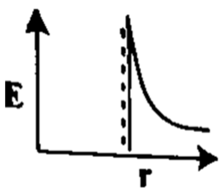
Sol. B  A

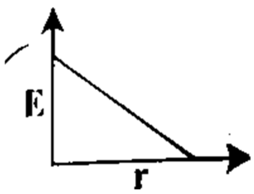
$W_{B\to A} = (V_A - V_B)q$

$= (-3-5)\times 5\times 10^{-3}$

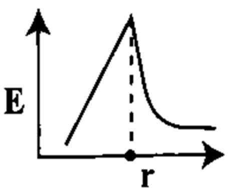
$= -0.04$ J

47. Charges are uniformly spread on the surface of a conducting sphere. The electric field from the centre of sphere to a point outside the sphere varies with distance r from the centre as

1) 

2) 

3) 

4) 

Ans. 1

Sol. $E_{in} = 0$

$E_{out} \propto \frac{1}{r}$

48. Match column -I with Column -II related to an electric dipole of dipole moment $\vec{P}$ that is placed in a uniform electric field $\vec{E}$

Column -I Angle between $\vec{P}$ and $\vec{E}$	Column-II Potential energy of the dipole
a) 180^0	i) -pE
b) 120^0	ii) pE
c) 90^0	iii) $\frac{1}{2}$pE
	iv) Zero

1) a-i, b-ii, c-iii 2) a-ii, b-iii, c-i
3) a-ii, b-i, c-iv 4) a-ii, b-iii, c-iv

Ans. 4

Sol. $U = -PE\cos\theta$

a) $\theta = 180^0 \Rightarrow \cos 180^0 = -1 \Rightarrow U = PE$

b) $\theta = 120^0 \Rightarrow \cos 120^0 = -\left(\frac{1}{2}\right) \Rightarrow U = \frac{PE}{2}$

c) $\theta = 90^0 \Rightarrow \cos 90^0 = 0 \Rightarrow U = 0$

49. Which of the following statements is not true?

1) Work done to move a charge on an equipotential surface is not zero

2) Equipotential surfaces are the surfaces where the potential is constant

3) Equipotential surfaces for a uniform electric field are parallel and equidistant from each other.

4) Electric field is always perpendicular to an equipotential surface

Ans. 1

Sol. Properties of equipotential surface

$\Delta v = 0$

$W = (\Delta v)q = 0$

50. Which of the following is a correct statement ?

1) Gauss's law is true for any open surface

2) Gauss's law is not applicable when charge are not symmetrically distributed over a closed surface

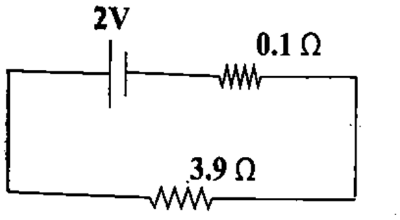
3) Gauss's law does not hold good for a charge situated outside Gaussian surface

4) Gauss's law is true for any closed surface

Ans. 4

Sol. Gauss's law states that electric flux associated with any closed surface is equal to $\frac{1}{\varepsilon_0}$ times of charge enclosed by that surface

51. In the following circuit, the terminal voltage across the cell is



1) 1.68 V
2) 1.95 V
3) 2.71 V
4) 0.52 V

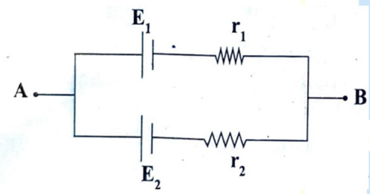
Ans. 2

Sol. $R_{eq} = R + r = 3.9 + 0.1 = 4\Omega$

$$i = \frac{E}{R_eq} = \frac{2}{4} = 0.5\Omega$$

$$V = E - ir$$
$$= 2 - 0.5 \times 0.1$$
$$= 1.95V$$

52. Two cells of emfs E_1 and E_2 and internal resistances r_1 and r_2 $(E_2 > E_1 \text{and } r_2 > r_1)$ respectively, are connected in parallel as shown in figure. The equivalent emf of the combination is E_{eq}. Then



1) $E_1 < E_2 < E_2$ and E_{eq} is nearer E_2
2) $E_{eq} > E_2$
3) $E_{eq} < E_1$
4) $E_1 < E_{eq} < E_2$ and E_{eq} is nearer E_1

Ans. 4

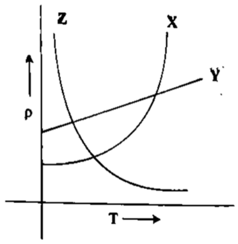
Sol. $$E_{equi} = \frac{E_1 r_2 + E_2 r_1}{r_1 + r_2}$$

Let $E_1 = 10V,\ r_1 = 10\Omega$

Let $E_2 = 20V,\ r_2 = 20\Omega$

$$E_{equi} = \frac{10(20) + 20(10)}{10 + 20} = \frac{400}{30} = 13.3V$$

53. The variations of resistivity ρ with absolute temperature T for three different materials X, Y and Z are shown in the graph below. Identify the materials X, Y and Z.



1) X-copper, Y-semiconductor , Z-nichrome
2) X-semiconductor, Y-nichrome, Z - copper
3) X- nichrome, Y-copper, Z-semiconductor
4) X-copper, Y-nichrome, Z-semiconductor

Ans. 4

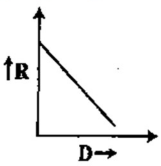
Sol. **Conceptual**

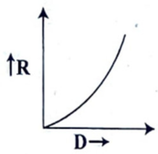
54. Given a current carrying wire of non-uniform cross -section, which of the following is constant throughout the length of wire
1) Drift speed
2) Current and drift speed
3) Current only
4) Current, electric field and drift speed

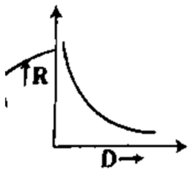
Ans. 3

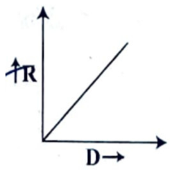
Sol. **Conceptual**

55. The graph between variation of resistance of a metal wire as a function of its diameter keeping other parameters like length and temperature constant is

1) 

2) 

3) 

4) 

Ans. 3

Sol. $$R = \frac{\rho\ell}{A}\left[\therefore A = \frac{\pi d^2}{4}\right]$$

$$R = \frac{4\rho\ell}{\pi d^2}$$

$$R \propto \frac{1}{d^2}$$

56. Two thin long parallel wires separated by a distance 'r' from each in vacuum carry a current of I ampere in opposite directions . Then they will

1) Attract each other with a force per unit length of $\frac{\mu_0 I^2}{2\pi r}$

2) Repel each other with a force per unit length of $\frac{\mu_0 I^2}{2\pi r}$

3) Repel each other with a force per unit length of $\frac{\mu_0 I^2}{2\pi r^2}$

4) Attract each other with a force per unit length of $\frac{\mu_0 I^2}{2\pi r^2}$

Ans. 2

Sol. $\frac{F}{\ell} = \frac{\mu_0 i_1 i_2}{2\pi r}$

$\frac{F}{\ell} = \frac{\mu_0 I^2}{2\pi r}$ [Repel each other]

57. A solenoid is 1 m long and 4 cm in diameter. It has five layers of windings of 1000 turns each and carries a current of 7A. The magnetic field at the centre of the solenoid is

1) 0.4396×10^{-5} T 2) 4.396×10^{-2} T

3) 43.96×10^{-2} T 4) 439.6 T

Ans. 2

Sol. $B = \mu_0 n i$

$B = 4\pi \times 10^{-7} \times 5 \times 1000 \times 7$

$B = 4.396 \times 10^{-2}$ T

58. Two similar galvanometers are converted into an ammeter and a milliammeter. The shunt resistance of ammeter as compared to the shunt resistance of milliammeter will be

1) Zero 2) More 3) Less 4) Equal

Ans. 3

Sol. The shunt of milliammeter will be of larger resistance, because a large part of main current will pass through the coil of the galvanometer which will work as small range ammeter

59. Which of the following statements is true in respect of diamagnetic substances?

1) They are feebly attracted by magnets

2) Permeability is greater than 1000

3) Susceptibility decreases with temperature

4) Susceptibility is small and negative

Ans. 4

Sol. susceptibility is small and negative

60. Identify the correct statement

1) A current carrying conductor produces an electric field around it

2) A straight current carrying conductor has circular magnetic field lines around it.

3) The direction of magnetic field due to a current element is given by Flemings Left Hand Rule

4) The magnetic field inside a solenoid is non-uniform

Ans. 2

Sol. A straight current carrying conductor has a circular magnetic field lines around it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NEET-2021 | KIMS, HUBLI
636 MARKS
DILEEP KUMAR PAGI
NEET-2024 | GIMS - GADAG
635 MARKS
ADARSH KAMAGOUDA
NEET-2024 | KIMS - BANGALORE
635 MARKS
RAKSHA H N
NEET-2023 | MMCRI, MYSORE
635 MARKS
PRABHURAJ MAHADEV M
NEET-2022 | BMC, BANGALORE
635 MARKS
AVINASH FAKEERAPPA Y
NEET-2022 | BMC, BANGALORE
635 MARKS
RAKESH M
NEET-2022 | MMCRI, MYSORE
635 MARKS
SURAJ B N MALALI
NEET-2024 | BMC - BANGALORE
633 MARKS
BANUSREE S
NEET-2024 | DR. BRAMC - BANGALORE
633 MARKS
MOHAMMAD ZAID
NEET-2021 | SABVIMS, BENGALURU
633 MARKS
ARJUN P J
NEET-2024 | CIMS - CHAMARAJANAGAR
632 MARKS
DAYENDRA A PATEL
NEET-2024 | GIMS - GADAG
632 MARKS
DARSHAN R MURAGUNDI
NEET-2024 | GIMS - GADAG
632 MARKS
VIKASGOUDA KUSHAL GOUDA PATIL
NEET-2024 | ESIMC - GULBARGA
632 MARKS
VAJRA
NEET-2024 | GMC - MAHABUBNAGAR
632 MARKS
GUJJULA HARSHITHA
NEET-2024 | NIMS - HYDERABAD
632 MARKS
VYKUNTAM SAI SATHVIKA
NEET-2022 | MMCRI, MYSORE
632 MARKS
MALLIKARJUNA B V
NEET-2024 | KIMS - UTTARA KANNADA
631 MARKS
KUSHI B M
NEET-2024 | CIMS - CHIKKABALLAPURA
631 MARKS
ANUSHREE M
NEET-2023 | KIMS, HUBLI
631 MARKS
SHIVAKUMAR NEELAKANTH H
NEET-2022 | KIMS, HUBLI
631 MARKS
SHRISHAIL SANASANI
NEET-2022 | KIMS, HUBLI
631 MARKS
SUJEET M ATHANI
NEET-2021 | SABVIMS, BENGALURU
631 MARKS
CHARITHA P S
NEET-2021 | CIMS, CHIKKAMAGALURU
630 MARKS
AMITH
NEET-2021 | GIMS, GADAG
630 MARKS
G SHASHANK
NEET-2021 | HIMS, HAVERI
630 MARKS
NISARGA T
NEET-2021 | KIMS, KOPPAL
630 MARKS
AMOGH B KOVALLI
NEET-2022 | JSSMC, MYSORE
630 MARKS
SHIVADEEP SS
NEET-2022 | MMCRI, MYSORE
630 MARKS
PANKAJ BASANAGOUD P
NEET-2021 | BMC, BENGALURU
630 MARKS
ARCHANA SUBHASH K
AND MANY MORE...

INDIVIDUAL ATTENTION, CARING AND MOTIVATION. WEEKLY, CUMMULATIVE AND GRAND TESTS IN THE NEET & JEE PATTERN

II PU SCIENCE ANNUAL EXAM - 2025 TOPPERS


592 MARKS / 600
NEHA DINESH
20259152883


591 MARKS / 600
SYED AKHYAR HUSSAINI
20259229052


590 MARKS
PREETHI S
20259152929


587 MARKS
ANANYA S BELKOTE
20259152711


586 MARKS
MOKSHALAKSHMI J
20259152858


586 MARKS
JAYANTH K S
20259142981


585 MARKS
DEEPAK ROOGI
20259142895


585 MARKS
PRATAP SIMHA N S
20259228895


585 MARKS
SPOORTHI
20259153027


585 MARKS
SHREYA S HARANAL
20259153006


585 MARKS
SUPRITA
20259153038

AND MANY MORE...

JEE MAIN TOPPERS OF DR ACADEMY


NIKHIL R
JEE Adv. SELECTION
IIT DHANBAD - 2022


ISHAQ HAMZA
99.62 PERCENTILE
IISC, BENGALURU - 2022


M SRIRAM SAI SANDEEP
97.77 PERCENTILE
IIIT DHARWAD - 2021


MAKKENA SAI PRAMATHI
97.12 PERCENTILE
NIT PUDUCHERRY - 2023


LIKITH S V
95.69 PERCENTILE
NIT ROURKELA - 2021


SHAILAJA S GIRNI
NIT Surathkal
220310128625 - 2022


VINAYAGOUD KAVADI
NIT Surathkal
230310865486 - 2023


TARUN N
99.09 PERCENTILE
240310757600 - 2024


CHIRANTHAN REDDY V
98.87 PERCENTILE
240310806545 - 2024


ROHITH BIRADAR
97.98 PERCENTILE
220310237864 - 2022


RAKSHA H N
97.18 PERCENTILE
240310289962 - 2024


SHRAVYAA S
97.07 PERCENTILE
230310157233 - 2023

JEE MAIN - 2025 PHASE-I ACHIEVERS

SUBJECTWISE TOP PERCENTILE

PHY 99.67

CHE 99.51

MAT 99.23


98.89
APP.NO. 250310925539
JAYANTH K S


97.67
APP.NO. 250310701826
HARSH B CHOUGALA


97.63
APP.NO. 250310059123
MOKSHALAKSHMI J


97.39
APP.NO. 250310057681
PREETHI S

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