NTA JEE Mains Apr 2026 Paper I

Section : **Mathematics Section A**

Q.1 Let f be a real polynomial of degree n such that $f(x) = f'(x)f''(x)$, for all $x \in \mathbb{R}$. If $f(0) = 0$, then $36\left(f'(2) + f''(2) + \int_0^2 f(x)dx\right)$ is equal to:

Options
1. 42
2. 46
3. 56
4. 66

Question Type : **MCQ**
Question ID : **695278242**
Option 1 ID : **695278830**
Option 2 ID : **695278831**
Option 3 ID : **695278832**
Option 4 ID : **695278833**
Status : **Answered**
Chosen Option : **3**

Q.2 Let $S = \left\{A = \begin{bmatrix} a & b \\ c & d \end{bmatrix} : a, b, c, d \in \{0, 1, 2, 3, 4\} \text{ and } A^2 - 4A + 3I = 0\right\}$ be a set of 2×2 matrices. Then the number of matrices in S, for which the sum of the diagonal elements is equal to 4, is:

Options
1. 19
2. 20
3. 17
4. 21

Question Type : **MCQ**
Question ID : **695278230**
Option 1 ID : **695278785**
Option 2 ID : **695278782**
Option 3 ID : **695278783**
Option 4 ID : **695278784**
Status : **Answered**
Chosen Option : **3**

Q.3 The square of the distance of the point $(-2, -8, 6)$ from the line $\frac{x-1}{1}=\frac{y-1}{2}=\frac{z}{-1}$ along the line $\frac{x+5}{1}=\frac{y+5}{-1}=\frac{z}{2}$ is equal to:

Options
1. 8
2. 3
3. 6
4. 12

Question Type : **MCQ**
Question ID : **695278240**
Option 1 ID : **695278824**
Option 2 ID : **695278822**
Option 3 ID : **695278823**
Option 4 ID : **695278825**
Status : **Not Answered**
Chosen Option : **--**

Q.4 Suppose that the mean and median of the non-negative numbers $21, 8, 17, a, 51, 103, b, 13, 67, (a > b)$, are 40 and 21, respectively. If the mean deviation about the median is 26, then $2a$ is equal to:

Options
1. 131
2. 161
3. 109
4. 117

Question Type : **MCQ**
Question ID : **695278235**
Option 1 ID : **695278805**
Option 2 ID : **695278804**
Option 3 ID : **695278802**
Option 4 ID : **695278803**
Status : **Not Answered**
Chosen Option : **--**

Q.5 Suppose that two chords, drawn from the point (1, 2) on the circle $x^2 + y^2 + x - 3y = 0$ are bisected by the y-axis. If the other ends of these chords are R and S, and the mid point of the line segment RS is (α, β), then $6(\alpha + \beta)$ is equal to:

Options

1. 4
2. 6
3. 1
4. 3

Question Type : **MCQ**
Question ID : **695278238**
Option 1 ID : **695278816**
Option 2 ID : **695278817**
Option 3 ID : **695278814**
Option 4 ID : **695278815**
Status : **Not Answered**
Chosen Option : **--**

Q.6 The area of the region $\{(x, y): y \le \pi - |x|, y \le |x \sin x|, y \ge 0\}$ is:

Options

1. $2 + \frac{\pi^2}{4}$
2. $1 + \frac{\pi^2}{8}$
3. $4 + \frac{\pi^2}{2}$
4. $\frac{\pi^2}{8} - 1$

Question Type : **MCQ**
Question ID : **695278243**
Option 1 ID : **695278835**
Option 2 ID : **695278834**
Option 3 ID : **695278837**
Option 4 ID : **695278836**
Status : **Answered**
Chosen Option : **2**

Q.7 Let $\int_{-2}^{2}\left(|\sin x|+[x\sin x]\right)dx = 2(3-\cos 2)+\beta$, where $[\cdot]$ is the greatest integer function. Then $\beta \sin\left(\frac{\beta}{2}\right)$ equals:

Options
1. 1
2. 4
3. 2
4. 8

Question Type : **MCQ**
Question ID : **695278244**
Option 1 ID : **695278838**
Option 2 ID : **695278840**
Option 3 ID : **695278839**
Option 4 ID : **695278841**
Status : **Not Answered**
Chosen Option : **--**

Q.8 The number of functions $f: \{1, 2, 3, 4\} \to \{a, b, c\}$, which are not onto, is:

Options
1. 35
2. 45
3. 48
4. 51

Question Type : **MCQ**
Question ID : **695278229**
Option 1 ID : **695278781**
Option 2 ID : **695278779**
Option 3 ID : **695278778**
Option 4 ID : **695278780**
Status : **Answered**
Chosen Option : **1**

Q.9 Let the smallest value of $k \in \mathbb{N}$, for which the coefficient of x^3 in $(1+x)^3+(1+x)^4+(1+x)^5+\ldots+(1+x)^{99}+(1+kx)^{100}$, $x \neq 0$, is $\left(43n+\frac{101}{4}\right)\left({}^{100}C_3\right)$ for some $n \in \mathbb{N}$, be p. Then the value of $p+n$ is:

Options
1. 10
2. 11
3. 12
4. 13

Question Type : **MCQ**
Question ID : **695278234**
Option 1 ID : **695278798**
Option 2 ID : **695278799**
Option 3 ID : **695278800**
Option 4 ID : **695278801**
Status : **Not Answered**
Chosen Option : **--**

Q.10 Let $[\cdot]$ denote the greatest integer function. If the domain of the function $f(x)=\cos^{-1}\left(\frac{4x+2[x]}{3}\right)$ is $[\alpha, \beta]$, then $12(\alpha+\beta)$ is equal to:

Options
1. 9
2. 6
3. 8
4. 4

Question Type : **MCQ**
Question ID : **695278226**
Option 1 ID : **695278768**
Option 2 ID : **695278766**
Option 3 ID : **695278767**
Option 4 ID : **695278769**
Status : **Not Answered**
Chosen Option : **--**

Q.11 Let z be a complex number such that $|z+2| = |z-2|$ and $\arg\left(\frac{z+3}{z-i}\right) = \frac{\pi}{4}$. Then $|z|^2$ is equal to:

Options

1. 5
2. 1
3. 4
4. 9

Question Type : **MCQ**
Question ID : **695278228**
Option 1 ID : **695278776**
Option 2 ID : **695278777**
Option 3 ID : **695278775**
Option 4 ID : **695278774**
Status : **Not Answered**
Chosen Option : **--**

Q.12 Let $y = y(x)$ be the solution of the differential equation $\frac{dy}{dx} = (1+x+x^2)(1-y+y^2)$, $y(0) = \frac{1}{2}$. Then $(2y(1) - 1)$ is equal to

Options

1. $\sqrt{3}\tan\left(\frac{11\sqrt{3}}{12}\right)$
2. $\sqrt{3}\tan\left(\frac{11\sqrt{3}}{6}\right)$
3. $\frac{\sqrt{3}}{2}\tan\left(\frac{11\sqrt{3}}{12}\right)$
4. $\frac{\sqrt{3}}{2}\tan\left(\frac{11\sqrt{3}}{6}\right)$

Question Type : **MCQ**
Question ID : **695278245**
Option 1 ID : **695278844**
Option 2 ID : **695278842**
Option 3 ID : **695278843**
Option 4 ID : **695278845**
Status : **Not Answered**
Chosen Option : **--**

Q.13 If the set of all solutions of $|x^2 + x - 9| = |x| + |x^2 - 9|$ is $[\alpha, \beta] \cup [\gamma, \infty)$, then $(\alpha^2 + \beta^2 + \gamma^2)$ is equal to:

Options
1. 9
2. 18
3. 72
4. 36

Question Type : **MCQ**
Question ID : **695278227**
Option 1 ID : **695278770**
Option 2 ID : **695278771**
Option 3 ID : **695278773**
Option 4 ID : **695278772**
Status : **Answered**
Chosen Option : **3**

Q.14 The first term of an A.P. of 30 non-negative terms is $\frac{10}{3}$. If the sum of this A.P. is the cube of its last term, then its common difference is:

Options
1. $\frac{25}{83}$
2. $\frac{5}{87}$
3. $\frac{5}{29}$
4. $\frac{15}{29}$

Question Type : **MCQ**
Question ID : **695278232**
Option 1 ID : **695278791**
Option 2 ID : **695278790**
Option 3 ID : **695278793**
Option 4 ID : **695278792**
Status : **Answered**
Chosen Option : **2**

Q.15 The number of ways, of forming a queue of 4 boys and 3 girls such that all the girls are not together, is:

Options
1. 3050
2. 5040
3. 4320
4. 3410

Question Type : **MCQ**
Question ID : **695278233**
Option 1 ID : **695278795**
Option 2 ID : **695278794**
Option 3 ID : **695278797**
Option 4 ID : **695278796**
Status : **Not Answered**
Chosen Option : **--**

Q.16 Let the line $L_1 : x + 3 = 0$ intersect the lines $L_2 : x - y = 0$ and $L_3 : 3x + y = 0$ at the points A and B, respectively. Let the bisector of the obtuse angle between the lines L_2 and L_3 intersect the line L_1 at the point C. Then $BC^2 : AC^2$ is equal to:

Options
1. 5:1
2. 2:3
3. 3:2
4. 1:5

Question Type : **MCQ**
Question ID : **695278236**
Option 1 ID : **695278806**
Option 2 ID : **695278808**
Option 3 ID : **695278809**
Option 4 ID : **695278807**
Status : **Not Answered**
Chosen Option : **--**

Q.17

If $y = \tan^{-1}\left(\frac{3\cos x - 4\sin x}{4\cos x + 3\sin x}\right) + 2\tan^{-1}\left(\frac{x}{1+\sqrt{1-x^2}}\right)$, then $\frac{dy}{dx}$ at $x = \frac{\sqrt{3}}{2}$ is equal to:

Options

1. 2
2. -1
3. 3
4. 1

Question Type : **MCQ**
Question ID : **695278241**
Option 1 ID : **695278829**
Option 2 ID : **695278827**
Option 3 ID : **695278826**
Option 4 ID : **695278828**
Status : **Not Answered**
Chosen Option : **--**

Q.18

Let $A = \begin{bmatrix} 1 & 1 & 2 \\ -2 & 0 & 1 \\ 1 & 3 & 5 \end{bmatrix}$. Then the sum of all elements of the matrix $adj(adj\ (2(adjA)^{-1}))$ is equal to:

Options

1. -4
2. 4
3. -3
4. 3

Question Type : **MCQ**
Question ID : **695278231**
Option 1 ID : **695278788**
Option 2 ID : **695278787**
Option 3 ID : **695278789**
Option 4 ID : **695278786**
Status : **Not Answered**
Chosen Option : **--**

Q.19 Let the vertex A of a triangle ABC be (1, 2), and the mid-point of the side AB be (5, −1). If the centroid of this triangle is (3, 4) and its circumcenter is (α, β), then $21(\alpha + \beta)$ is equal to:

Options
1. 403
2. 309
3. 497
4. 524

Question Type : **MCQ**
Question ID : **695278237**
Option 1 ID : **695278811**
Option 2 ID : **695278810**
Option 3 ID : **695278812**
Option 4 ID : **695278813**
Status : **Answered**
Chosen Option : **3**

Q.20 A line with direction ratios 1, −1, 2 intersects the lines $\frac{x}{2} = \frac{y}{3} = \frac{z+1}{3}$ and $\frac{x+1}{-1} = \frac{y-2}{1} = \frac{z}{4}$ at the points P and Q, respectively. If the length of the line segment PQ is α, then $225\alpha^2$ is equal to:

Options
1. 1014
2. 1204
3. 1024
4. 1104

Question Type : **MCQ**
Question ID : **695278239**
Option 1 ID : **695278819**
Option 2 ID : **695278821**
Option 3 ID : **695278818**
Option 4 ID : **695278820**
Status : **Not Answered**
Chosen Option : **--**

Section : **Mathematics Section B**

Q.21 If $A = \frac{\sin 3^\circ}{\cos 9^\circ} + \frac{\sin 9^\circ}{\cos 27^\circ} + \frac{\sin 27^\circ}{\cos 81^\circ}$ and $B = \tan 81^\circ - \tan 3^\circ$, then $\frac{B}{A}$ is equal to _____.

Given Answer : **--**

Question Type : **SA**
Question ID : **695278248**
Status : **Not Answered**

Q.22 Consider the parabola $P: y^2 = 4kx$ and the ellipse $E: \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$. Let the line segment joining the points of intersection of P and E, be their latus rectums. If the eccentricity of E is e, then $e^2 + 2\sqrt{2}$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **695278247**
Status : **Not Answered**

Q.23 The number of points, at which the function $f(x) = \max\{6x, 2+3x^2\} + |x-1|\cos\left|x^2 - \frac{1}{4}\right|$, $x \in (-\pi, \pi)$, is not differentiable, is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **695278250**
Status : **Not Answered**

Q.24 Let $\overrightarrow{a_k} = (\tan\theta_k)\hat{i} + \hat{j}$ and $\overrightarrow{b_k} = \hat{i} - (\cot\theta_k)\hat{j}$, where $\theta_k = \frac{2^{k-1}\pi}{2^n + 1}$, for some $n \in \mathbb{N}$, $n > 5$. Then the value of $\frac{\sum_{k=1}^{n} |\overrightarrow{a_k}|^2}{\sum_{k=1}^{n} |\overrightarrow{b_k}|^2}$ is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **695278249**
Status : **Not Answered**

Q.25 A coin is tossed 8 times. If the probability that exactly 4 heads appear in the first six tosses and exactly 3 heads appear in the last five tosses is p, then $96p$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **695278246**
Status : **Not Answered**

Section : **Physics Section A**

Q.26 Two nuclei of mass number 3 combine with another nucleus of mass number 4 to yield a nucleus of mass number 10. If the binding energy per nucleon for the mass numbers 3, 4 and 10 are 5.6 MeV, 7.4 MeV and 6.1 MeV, respectively, then in the process, ΔMc^2 = _____MeV.

Options
1. 4.3
2. 7.9
3. 2.2
4. 6.9

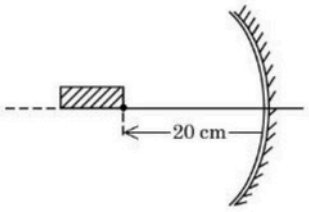
Question Type : **MCQ**
Question ID : **695278254**
Option 1 ID : **695278866**
Option 2 ID : **695278864**
Option 3 ID : **695278865**
Option 4 ID : **695278863**
Status : **Answered**
Chosen Option : **3**

Q.27 In a screw gauge when the circular scale is given five complete rotations it moves linearly by 2.5 mm. If the circular scale has 100 divisions, the least count of screw gauge is _____ mm.

Options
1. 5×10^{-2}
2. 1×10^{-2}
3. 5×10^{-3}
4. 1×10^{-3}

Question Type : **MCQ**
Question ID : **695278251**
Option 1 ID : **695278853**
Option 2 ID : **695278851**
Option 3 ID : **695278854**
Option 4 ID : **695278852**
Status : **Answered**
Chosen Option : **1**

Q.28 A rod of length 10 cm lies along the principle axis of a concave mirror of focal length 10 cm as shown in figure. The length of the image is _____ cm.



Options
1. 5
2. 7.5
3. 7
4. 2.5

Question Type : **MCQ**
Question ID : **695278264**
Option 1 ID : **695278904**
Option 2 ID : **695278905**
Option 3 ID : **695278906**
Option 4 ID : **695278903**
Status : **Answered**
Chosen Option : **1**

Q.29 A solid sphere of mass M and radius R is divided into two unequal parts. The smaller part having mass $M/8$ is converted into a sphere of radius r and the larger part is converted into a circular disc of thickness t and radius $2R$. If I_1 is moment of inertia of a sphere having radius r about an axis through its centre and I_2 is the moment of inertia of a disc about its diameter, the ratio of their moment of inertia I_2/I_1 = _____.

Options
1. 35
2. 210
3. 140
4. 70

Question Type : **MCQ**
Question ID : **695278255**
Option 1 ID : **695278867**
Option 2 ID : **695278870**
Option 3 ID : **695278869**
Option 4 ID : **695278868**
Status : **Answered**
Chosen Option : **3**

Q.30 An insulated wire is wound so that it forms a flat coil with $N = 200$ turns. The radius of the innermost turn is $r_1 = 3$ cm, and of the outermost turn $r_2 = 6$ cm. If 20 mA current flows in it then the magnetic moment will be $\alpha \times 10^{-2}$ A.m^2. The value of α is_____.

Options
1. 2.64
2. 1.2
3. 4.4
4. 3.25

Question Type : **MCQ**
Question ID : **695278266**
Option 1 ID : **695278912**
Option 2 ID : **695278914**
Option 3 ID : **695278911**
Option 4 ID : **695278913**
Status : **Answered**
Chosen Option : **2**

Q.31 A telescope with objective diameter R is used to observe a distant star emitting light of wavelength 500 nm, at a resolution of 5×10^{-7} radian. The value of R is _____ cm.

Options
1. 305
2. 244
3. 122
4. 61

Question Type : **MCQ**
Question ID : **695278269**
Option 1 ID : **695278926**
Option 2 ID : **695278925**
Option 3 ID : **695278924**
Option 4 ID : **695278923**
Status : **Answered**
Chosen Option : **2**

Q.32 A voltmeter with internal resistance of $x\ \Omega$ can be used to measure upto 20 V. In order to increase its measuring range to 30 V, the required modification is to_____.

Options

1. connect resistor of $\frac{x}{2}\Omega$, in series with voltmeter.
2. connect a resistor of $x\ \Omega$ in series with voltmeter.
3. connect resistor of $2x\ \Omega$ in parallel to voltmeter.
4. connect resistor of $\frac{x}{2}\Omega$, in parallel to voltmeter.

Question Type : **MCQ**
Question ID : **695278262**
Option 1 ID : **695278895**
Option 2 ID : **695278897**
Option 3 ID : **695278898**
Option 4 ID : **695278896**
Status : **Not Answered**
Chosen Option : **--**

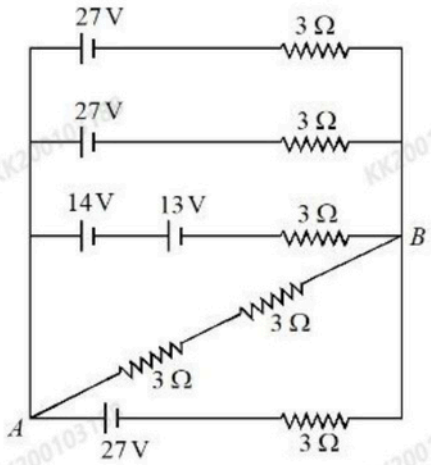
Q.33 The time taken by a block of mass m to slide down from the highest point to the lowest point on a rough inclined plane is 50 % more compared to the time taken by the same block on identical inclined smooth plane. Both inclined planes are at 45° with the horizontal. The coefficient of kinetic friction between the rough inclined surface and block is _____.

Options

1. 3/4
2. 4/9
3. 2/3
4. 5/9

Question Type : **MCQ**
Question ID : **695278253**
Option 1 ID : **695278859**
Option 2 ID : **695278862**
Option 3 ID : **695278860**
Option 4 ID : **695278861**
Status : **Answered**
Chosen Option : **3**

Q.34 The voltage and the current between A and B points shown in the circuit are_____.



Options
1. 27 V, 4 A
2. 24 V, 4 A
3. 24 V, 12 A
4. 18 V, 12 A

Question Type : **MCQ**
Question ID : **695278268**
Option 1 ID : **695278922**
Option 2 ID : **695278920**
Option 3 ID : **695278919**
Option 4 ID : **695278921**
Status : **Not Answered**
Chosen Option : **--**

Q.35 The increase in the pressure required to decrease the volume (ΔV) of water is 6.3×10^7 N/m^2. The percentage decrease in the volume is _____.
(Bulk modulus of water = 2.1×10^9 N/m^2.)

Options
1. 6 %
2. 4 %
3. 3 %
4. 2 %

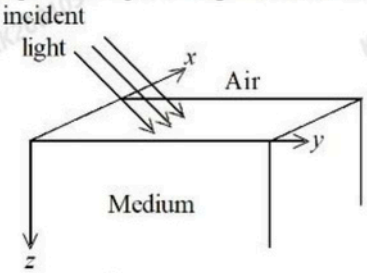
Question Type : **MCQ**
Question ID : **695278252**
Option 1 ID : **695278857**
Option 2 ID : **695278858**
Option 3 ID : **695278856**
Option 4 ID : **695278855**
Status : **Not Answered**
Chosen Option : **--**

Q.36 A parallel plate air capacitor is connected to a battery. The plates are pulled apart at uniform speed v. If x is the separation between the plates at any instant, then the time rate of change of electrostatic energy of the capacitor is proportional to x^{α}, where α is _____.

Options
1. -1
2. 2
3. -2
4. 1

Question Type : **MCQ**
Question ID : **695278265**
Option 1 ID : **695278909**
Option 2 ID : **695278910**
Option 3 ID : **695278907**
Option 4 ID : **695278908**
Status : **Not Answered**
Chosen Option : **--**

Q.37 An unpolarized light is incident on the plane interface of air-dielectric medium shown in figure. If the incident angle is equal to Brewster angle, identify the expression representing reflected wave.



Options
1. $(E_x\hat{j}+E_y\hat{k})\sin\left(ky+kz-\omega t\right)$
2. $(E_x\hat{i}+E_y\hat{j}+E_z\hat{k})\sin\left(kx+ky-kz-\omega t\right)$
3. $(E_x\hat{i}+E_z\hat{k})\sin\left(kx+ky-\omega t\right)$
4. $(E_x\hat{i}+E_y\hat{j})\sin\left(kx-kz-\omega t\right)$

Question Type : **MCQ**
Question ID : **695278270**
Option 1 ID : **695278929**
Option 2 ID : **695278930**
Option 3 ID : **695278928**
Option 4 ID : **695278927**
Status : **Not Answered**
Chosen Option : **--**

Q.38 One gas of n_1 mole of molecules at temperature T_1, volume V_1, and pressure P_1, and another gas of n_2 mole of molecules at temperature T_2, volume V_2, and pressure P_2, are mixed resulting in pressure P and volume V of the mixture. The temperature of the mixture is _____.

Options

1. $T_1 T_2 PV/(T_2 P_1 V_1 + T_1 P_2 V_2)$
2. $(T_1 + T_2)/2$
3. $|T_1 - T_2|/2$
4. $(T_2 P_1 V_1 + T_1 P_2 V_2)/(T_1 T_2 PV)$

Question Type : **MCQ**
Question ID : **695278260**
Option 1 ID : **695278888**
Option 2 ID : **695278887**
Option 3 ID : **695278890**
Option 4 ID : **695278889**
Status : **Answered**
Chosen Option : **1**

Q.39 A string A of length 0.314 m and Young's modulus 2×10^{10} N/m^2 is connected to another string B of length and Young's modulus both twice of those of A. This series combination of strings is then suspended from a rigid support and its free end is fixed to a load of mass 0.8 kg. The net change in length of the combination is _____mm.
(radius of both the strings is 0.2 mm and acceleration due to gravity =10 m/s^2)
(Mass of both strings is to be neglected as compared to the mass of load)

Options

1. 1.9
2. 1
3. 3
4. 2

Question Type : **MCQ**
Question ID : **695278259**
Option 1 ID : **695278885**
Option 2 ID : **695278886**
Option 3 ID : **695278883**
Option 4 ID : **695278884**
Status : **Not Answered**
Chosen Option : **--**

Q.40 The two projectiles are projected with the same initial velocities at the 15° and 30° with respect to the horizontal. The ratio of their ranges is $1:x$. The value of x is

Options

1. $\frac{1}{\sqrt{2}}$
2. $2\sqrt{3}$
3. $\sqrt{3}$
4. $\sqrt{2}$

Question Type : **MCQ**
Question ID : **695278256**
Option 1 ID : **695278874**
Option 2 ID : **695278873**
Option 3 ID : **695278872**
Option 4 ID : **695278871**
Status : **Answered**
Chosen Option : **3**

Q.41 An ideal gas undergoes a process maintaining relation between pressure (P) and volume(V) as $P = P_0\left(1+\left(\frac{V_0}{V}\right)^2\right)^{-1}$, where P_0 and V_0 are constants. If two samples A and B (two moles each) with initial volumes V_0 and $3V_0$ respectively undergo above mentioned process and attain same pressure, then the difference at the temperatures of these samples, $T_B - T_A$ is _____.

(R = gas constant)

Options

1. $\frac{7P_0V_0}{6R}$
2. $\frac{11P_0V_0}{10R}$
3. $\frac{13P_0V_0}{11R}$
4. $\frac{9P_0V_0}{8R}$

Question Type : **MCQ**
Question ID : **695278261**
Option 1 ID : **695278893**
Option 2 ID : **695278892**
Option 3 ID : **695278894**
Option 4 ID : **695278891**
Status : **Answered**
Chosen Option : **1**

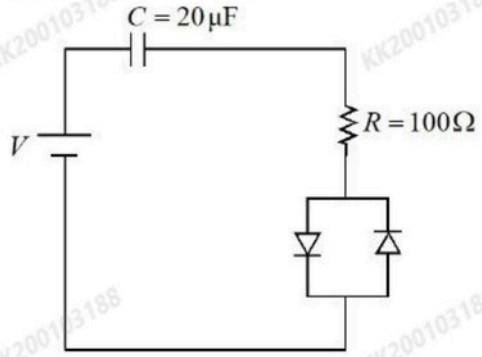
Q.42 A slit of width a is illuminated by light of wavelength λ. The linear separation between 1st and 3rd minima in the diffraction pattern produced on a screen placed at a distance D from the slit system is _____.

Options

1. $1.5\frac{D\lambda}{a}$
2. $3\frac{D\lambda}{a}$
3. $2\frac{D\lambda}{a}$
4. $\frac{D\lambda}{a}$

Question Type : **MCQ**
Question ID : **695278258**
Option 1 ID : **695278880**
Option 2 ID : **695278882**
Option 3 ID : **695278881**
Option 4 ID : **695278879**
Status : **Answered**
Chosen Option : **3**

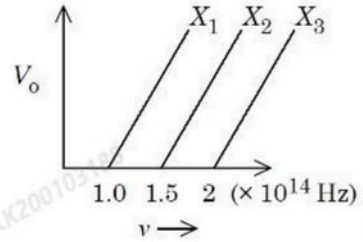
Q.43 Consider a circuit consisting of a capacitor (20 μF), resistor (100 Ω) and two identical diodes as shown in figure. The resistance of diode under forward biasing condition is 10 Ω. The time constant of the circuit is $\alpha \times 10^{-3}$ s. The value of α is _____



Options
1. 2.0
2. 2.2
3. 2.1
4. 2.4

Question Type : **MCQ**
Question ID : **695278267**
Option 1 ID : **695278916**
Option 2 ID : **695278915**
Option 3 ID : **695278917**
Option 4 ID : **695278918**
Status : **Answered**
Chosen Option : **1**

Q.44 The graph shows variation of stopping potential V_o with the frequency v of the incident radiation for three photosensitive metals X_1, X_2 and X_3. Which metal will give out electrons with greater kinetic energy, for the same wavelength of incident radiation?

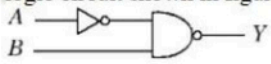


Options

1. X_1
2. X_3
3. X_2
4. All the metals will give out photo electrons with same kinetic energies.

Question Type : **MCQ**
Question ID : **695278257**
Option 1 ID : **695278875**
Option 2 ID : **695278877**
Option 3 ID : **695278876**
Option 4 ID : **695278878**
Status : **Answered**
Chosen Option : **2**

Q.45 Two 4 bits binary numbers, $A = 1101$ and $B = 1010$ are given in the inputs of a logic circuit shown in figure below. The output (Y) will be :



Options

1. $Y = 1101$
2. $Y = 1000$
3. $Y = 0111$
4. $Y = 0010$

Question Type : **MCQ**
Question ID : **695278263**
Option 1 ID : **695278899**
Option 2 ID : **695278902**
Option 3 ID : **695278901**
Option 4 ID : **695278900**
Status : **Answered**
Chosen Option : **3**

Section : **Physics Section B**

Q.46 The velocity of a particle executing simple harmonic motion along x-axis is described as $v^2 = 50 - x^2$, where x represents displacement. If the time period of motion is $\frac{x}{7}$ s, the value of x is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **695278273**
Status : **Not Answered**

Q.47 A 1 kg block subjected to two simultaneous forces $\left(2\hat{i}+3\hat{j}+4\hat{k}\right)$ N and $\left(3\hat{i}-\hat{j}-2\hat{k}\right)$ N is moved a distance of 25 m along $\left(3\hat{i}-4\hat{j}\right)$ direction. The work done in this process is _____J.

Given **225**
Answer :

Question Type : **SA**
Question ID : **695278271**
Status : **Answered**

Q.48 An inductor of 10 mH, capacitor of 0.1 μF and a resistor of 100 Ω are connected in series across an *a.c* power supply 220 V, 70 Hz. The power factor of the given circuit is 0.5. The difference in the inductive reactance and capacitance reactance is $\sqrt{3}\ \alpha\ \Omega$. The value of α is _____.

Given **100**
Answer :

Question Type : **SA**
Question ID : **695278275**
Status : **Answered**

Q.49 The surface tension of a soap solution is 3.5×10^{-2} N/m. The work required to increase the radius of a soap bubble from 1 cm to 2 cm is $\alpha \times 10^{-6}$ J. The value of α is _____.
$(\pi = 22/7)$

Given --
Answer :

Question Type : **SA**
Question ID : **695278272**
Status : **Not Answered**

Q.50 A body of mass 2 kg begins to move under the influence of time dependent force $\vec{F} = \left(2t\,\hat{i} + 6t^2\,\hat{j}\right)$ N, where $\hat{i}$ and $\hat{j}$ are unit vectors along x and y-axis respectively. The power produced by the force at $t = 2$ s is ____W.

Given --
Answer :

Question Type : **SA**
Question ID : **695278274**
Status : **Not Answered**

Section : **Chemistry Section A**

Q.51 Which of the following is correct set of 4 quantum numbers of 19^{th} electron in Chromium (Atomic number = 24) in accordance with Aufbau principle?

Options

1. $n = 4, l = 1, m = 0, s = +\frac{1}{2}$
2. $n = 3, l = 2, m = -2, s = +\frac{1}{2}$
3. $n = 3, l = 2, m = +2, s = +\frac{1}{2}$
4. $n = 4, l = 0, m = 0, s = +\frac{1}{2}$

Question Type : **MCQ**
Question ID : **695278278**
Option 1 ID : **695278946**
Option 2 ID : **695278945**
Option 3 ID : **695278944**
Option 4 ID : **695278947**
Status : **Answered**
Chosen Option : **1**

Q.52 At T(K), the equilibrium constant of $A_2(g) + B_2(g) \rightleftharpoons C(g)$ is 2.7×10^{-5}. What is the equilibrium constant for $\frac{1}{3}A_2(g) + \frac{1}{3}B_2(g) \rightleftharpoons \frac{1}{3}C(g)$ at the same temperature?

Options
1. 3×10^{-2}
2. $(2.7 \times 10^{-5})^3$
3. 6×10^{-2}
4. $\sqrt{2.7 \times 10^{-5}}$

Question Type : **MCQ**
Question ID : **695278280**
Option 1 ID : **695278955**
Option 2 ID : **695278952**
Option 3 ID : **695278953**
Option 4 ID : **695278954**
Status : **Answered**
Chosen Option : **1**

Q.53 What is the ratio of wave number of first line (lowest energy line) of Balmer series of H atomic spectrum to first line of its Brackett series?

Options
1. 5:0.81
2. 5:27
3. 5:1
4. 5:1.75

Question Type : **MCQ**
Question ID : **695278277**
Option 1 ID : **695278941**
Option 2 ID : **695278943**
Option 3 ID : **695278940**
Option 4 ID : **695278942**
Status : **Answered**
Chosen Option : **1**

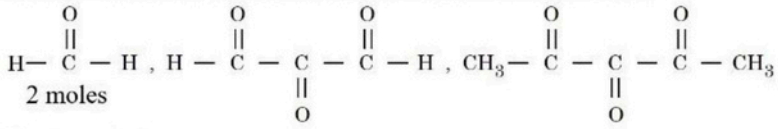
Q.54 Increasing order of electron withdrawing power of following functional groups is:

a. $-CN$
b. $-COOH$
c. $-NO_2$
d. $-I$

Options
1. $c < a < b < d$
2. $c < b < d < a$
3. $a < b < c < d$
4. $d < b < a < c$

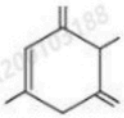
Question Type : **MCQ**
Question ID : **695278288**
Option 1 ID : **695278985**
Option 2 ID : **695278984**
Option 3 ID : **695278987**
Option 4 ID : **695278986**
Status : **Answered**
Chosen Option : **4**

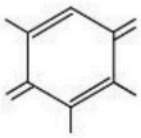
Q.55 An alkene (X) on ozonolysis followed by reduction gives following products.

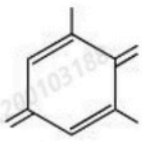


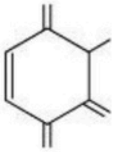
The alkene (X) is:

Options

1. 

2. 

3. 

4. 

Question Type : **MCQ**
Question ID : **695278289**
Option 1 ID : **695278988**
Option 2 ID : **695278990**
Option 3 ID : **695278991**
Option 4 ID : **695278989**
Status : **Not Answered**
Chosen Option : **--**

Q.56 Given below are two statements:

Statement I: The covalency of oxygen is generally two but it can exceed upto four. The oxidation state of oxygen in SO_2 is -2 and in OF_2 it is $+2$.

Statement II: The anomalous behaviour of oxygen when compared to the other elements of group 16 is due to its small size and high electronegativity.

In the light of the above statements, choose the ***correct*** answer from the options given below

Options

1. Both Statement I and Statement II are true
2. Statement I is false but Statement II is true
3. Both Statement I and Statement II are false
4. Statement I is true but Statement II is false

Question Type : **MCQ**
Question ID : **695278284**
Option 1 ID : **695278968**
Option 2 ID : **695278971**
Option 3 ID : **695278969**
Option 4 ID : **695278970**
Status : **Answered**
Chosen Option : **1**

Q.57 **Correct** statements from the following are

A. Potassium dichromate is an oxidising agent and it oxidises $FeSO_4$ to $Fe_2(SO_4)_3$ in acidic medium.
B. Sodium dichromate can be used as primary standard in volumetric estimation.
C. CrO_4^{2-} and $Cr_2O_7^{2-}$ are interconvertible in aqueous solution by varying the pH of the solution.
D. Cr-O-Cr bond angle in $Cr_2O_7^{2-}$ is 126°.

Choose the correct answer from the options given below:

Options

1. A, B and C Only
2. A, C and D Only
3. B and D Only
4. A and C Only

Question Type : **MCQ**
Question ID : **695278286**
Option 1 ID : **695278976**
Option 2 ID : **695278977**
Option 3 ID : **695278979**
Option 4 ID : **695278978**
Status : **Answered**
Chosen Option : **1**

Q.58 Consider the first order reaction R → P.
The fraction of molecules decomposed in the given first order reaction can be expressed as

Options
1. $1 + e^{k_1 t}$
2. $1 + e^{-k_1 t}$
3. $1 - e^{k_1 t}$
4. $1 - e^{-k_1 t}$

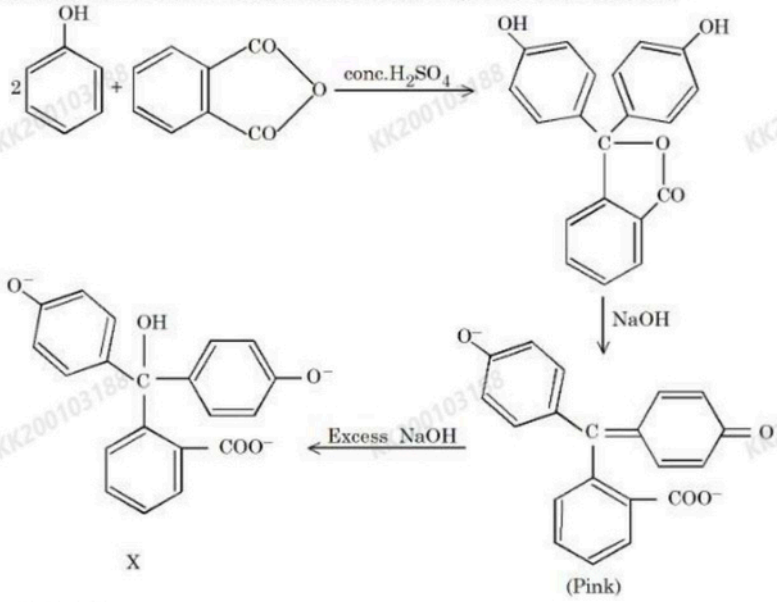
Question Type : **MCQ**
Question ID : **695278282**
Option 1 ID : **695278961**
Option 2 ID : **695278962**
Option 3 ID : **695278960**
Option 4 ID : **695278963**
Status : **Not Answered**
Chosen Option : **--**

Q.59 Number of moles and number of molecules in 1.4187 L of SO_2 at STP respectively are

Options
1. $0.1266;\ 3.812 \times 10^{22}$
2. $0.1266;\ 7.6238 \times 10^{22}$
3. $0.0633;\ 3.812 \times 10^{22}$
4. $0.0633;\ 7.6238 \times 10^{22}$

Question Type : **MCQ**
Question ID : **695278276**
Option 1 ID : **695278936**
Option 2 ID : **695278938**
Option 3 ID : **695278937**
Option 4 ID : **695278939**
Status : **Answered**
Chosen Option : **3**

Q.60 Identify the colour of compound 'X' in the sequence of the reaction.



Options
1. Green
2. Violet
3. Red
4. Colourless

Question Type : **MCQ**
Question ID : **695278295**
Option 1 ID : **6952781013**
Option 2 ID : **6952781012**
Option 3 ID : **6952781014**
Option 4 ID : **6952781015**
Status : **Not Answered**
Chosen Option : **--**

Q.61 Match the **LIST-I** with **LIST-II**

List-I Name of reaction		List-II Reagent or catalyst used	
A.	Finkelstein reaction	I.	SbF_3
B.	Swarts reaction	II.	Na, dry ether
C.	Sandmeyer's reaction	III.	NaI
D.	Fittig reaction	IV.	Cu_2Cl_2

Choose the ***correct*** answer from the options given below:

Options
1. A-III, B-I, C-IV, D-II
2. A-I, B-III, C-II, D-IV
3. A-I, B-IV, C-III, D-II
4. A-IV, B-II, C-I, D-III

Question Type : **MCQ**
Question ID : **695278290**
Option 1 ID : **695278993**
Option 2 ID : **695278995**
Option 3 ID : **695278992**
Option 4 ID : **695278994**
Status : **Answered**
Chosen Option : **1**

Q.62 Given below are two statements:

Statement I: For an ideal gas, heat capacity at constant volume is always greater than the heat capacity at constant pressure.

Statement II: In a constant volume process, no work is produced and all the heat withdrawn goes into the chaotic motion and is reflected by a temperature increase of the ideal gas.

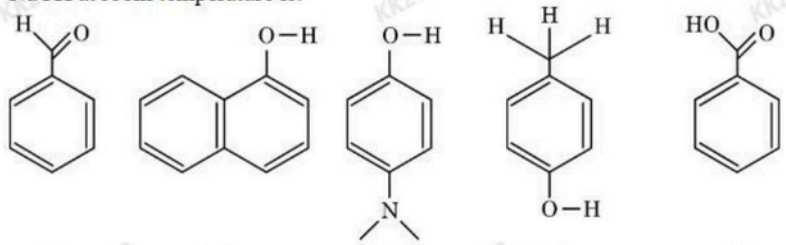
In the light of the above statements, choose the ***correct*** answer from the options given below

Options

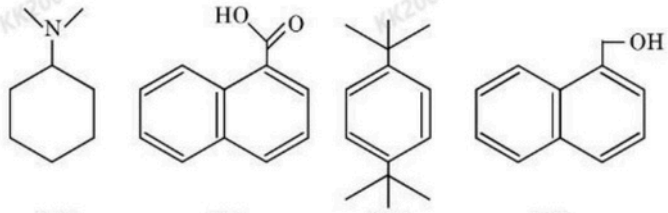
1. Both Statement I and Statement II are false
2. Statement I is true but Statement II is false
3. Statement I is false but Statement II is true
4. Both Statement I and Statement II are true

Question Type : **MCQ**
Question ID : **695278279**
Option 1 ID : **695278949**
Option 2 ID : **695278950**
Option 3 ID : **695278951**
Option 4 ID : **695278948**
Status : **Answered**
Chosen Option : **3**

Q.63 Amongst the following, the total number of compounds soluble in aqueous NaOH at room temperature is:



(I) (II) (III) (IV) (V)



(VI) (VII) (VIII) (IX)

Options
1. 4
2. 5
3. 6
4. 3

Question Type : **MCQ**
Question ID : **695278291**
Option 1 ID : **695278997**
Option 2 ID : **695278996**
Option 3 ID : **695278998**
Option 4 ID : **695278999**
Status : **Not Answered**
Chosen Option : **--**

Q.64 The **correct** statements among the following are,

A. Mo(VI) and W(VI) are less stable than Cr(VI).
B. Ce^{4+} and Tb^{4+} are oxidant while Eu^{2+} and Yb^{2+} are reductant.
C. Cm and Am have seven unpaired electrons.
D. Actinoid contraction is greater from element to element than lanthanoid contraction.

Choose the correct answer from the options given below:

Options
1. A and B Only
2. C and D Only
3. B and D Only
4. A and C Only

Question Type : **MCQ**
Question ID : **695278285**
Option 1 ID : **695278972**
Option 2 ID : **695278973**
Option 3 ID : **695278974**
Option 4 ID : **695278975**
Status : **Not Answered**
Chosen Option : **--**

Q.65 In order to oxidise a mixture of 1 mole each of FeC_2O_4, $Fe_2(C_2O_4)_3$, $FeSO_4$ and $Fe_2(SO_4)_3$ in acidic medium, the number of moles of $KMnO_4$ required is

Options
1. 5
2. 3
3. 7
4. 2

Question Type : **MCQ**
Question ID : **695278281**
Option 1 ID : **695278958**
Option 2 ID : **695278956**
Option 3 ID : **695278959**
Option 4 ID : **695278957**
Status : **Answered**
Chosen Option : **3**

Q.66 Match the **LIST-I** with **LIST-II**

List-I Name of amino acid		List-II One letter symbol/type	
A.	Arginine	I.	D/Non-essential
B.	Aspartic acid	II.	R/Essential
C.	Lysine	III.	E/Non-essential
D.	Glutamic acid	IV.	K/Essential

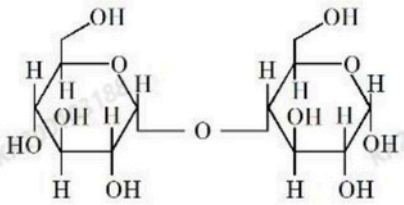
Choose the ***correct*** answer from the options given below:

Options
1. A-II, B-I, C-IV, D-III
2. A-IV, B-III, C-II, D-I
3. A-II, B-IV, C-I, D-III
4. A-III, B-IV, C-I, D-II

Question Type : **MCQ**
Question ID : **695278294**
Option 1 ID : **6952781008**
Option 2 ID : **6952781009**
Option 3 ID : **6952781011**
Option 4 ID : **6952781010**
Status : **Answered**
Chosen Option : **3**

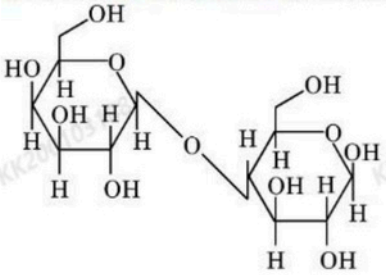
Q.67 Given below are two statements:

Statement I: The structure of Maltose is given below:



Maltose is a non-reducing sugar.

Statement II: The structure of Lactose is given below:



Lactose is a reducing sugar.

In the light of the above statements, choose the ***correct*** answer from the options given below

Options

1. Both Statement I and Statement II are true
2. Statement I is true but Statement II is false
3. Statement I is false but Statement II is true
4. Both Statement I and Statement II are false

Question Type : **MCQ**
Question ID : **695278293**
Option 1 ID : **6952781004**
Option 2 ID : **6952781006**
Option 3 ID : **6952781007**
Option 4 ID : **6952781005**
Status : **Answered**
Chosen Option : **1**

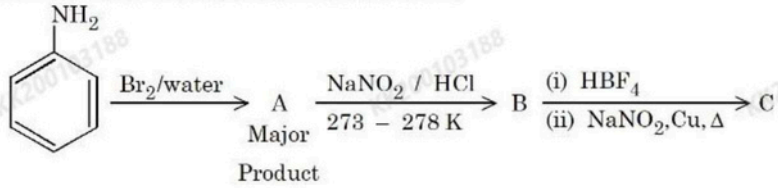
Q.68 A monoatomic anion (A^-) has 45 neutrons and 36 electrons. Atomic mass, group in the periodic table and physical state at room temperature of the element (A) respectively are

Options

1. 80, 17, liquid
2. 81, 15, gas
3. 80, 16, gas
4. 81, 16, solid

Question Type : **MCQ**
Question ID : **695278283**
Option 1 ID : **695278964**
Option 2 ID : **695278967**
Option 3 ID : **695278966**
Option 4 ID : **695278965**
Status : **Answered**
Chosen Option : **4**

Q.69 Product C of the following reaction sequence will be



Options

1. 1-Bromo-4-nitrobenzene
2. 1, 3, 5-Tribromo-2-nitrobenzene
3. 1, 3, 5-Tribromobenzene
4. 4-Bromo-1-nitrobenzene

Question Type : **MCQ**
Question ID : **695278292**
Option 1 ID : **6952781000**
Option 2 ID : **6952781001**
Option 3 ID : **6952781003**
Option 4 ID : **6952781002**
Status : **Answered**
Chosen Option : **2**

Q.70 Match the **LIST-I** with **LIST-II**

List-I Complex ion		List-II Calculated spin only magnetic moment (BM)	
A.	$[Cr(H_2O)_6]^{2+}$	I.	3.87
B.	$[Co(H_2O)_6]^{2+}$	II.	5.92
C.	$[Cu(H_2O)_6]^{2+}$	III.	4.90
D.	$[Mn(H_2O)_6]^{2+}$	IV.	1.73

Choose the ***correct*** answer from the options given below:

Options
1. A-II, B-I, C-III, D-IV
2. A-IV, B-II, C-I, D-III
3. A-I, B-III, C-IV, D-II
4. A-III, B-I, C-IV, D-II

Question Type : **MCQ**
Question ID : **695278287**
Option 1 ID : **695278981**
Option 2 ID : **695278982**
Option 3 ID : **695278980**
Option 4 ID : **695278983**
Status : **Answered**
Chosen Option : **4**

Section : **Chemistry Section B**

Q.71 2.0 g of a bromo hydrocarbon (X) was subjected to Carius analysis, gave 3.36 g of AgBr. The percentage of carbon in the compound (X) is 26.7%. Total number of carbon atoms in the empirical formula for compound (X) is _____.
(Given molar mass in g mol^{-1} H:1, C:12, Br : 80, Ag : 108)

Given --
Answer :

Question Type : **SA**
Question ID : **695278298**
Status : **Not Answered**

Q.72 Consider the following sequence of reactions to give the major product (X)

(i) CH_3Cl / anhydrous $AlCl_3$
(ii) Cl_2 / $FeCl_3$
(iii) $K_2Cr_2O_7$ / H_2SO_4

→ (X) Major Product

P g of the major product (X) formed is reacted with $NaHCO_3$ solution to liberate a gas which occupied 11.2 dm^3 at STP.
P = _____g.
(Given molar mass in g mol^{-1} H:1, C:12, O:16, Cl:35.5)

Given --
Answer :

Question Type : **SA**
Question ID : **695278297**
Status : **Not Answered**

Q.73 The pH of a solution obtained by mixing 5 mL of 0.1 M NH_4OH solution with 250 mL of 0.1 M NH_4Cl solution is _____$\times 10^{-2}$.(Nearest integer)
Given: pK_b (NH_4OH) = 4.74

log 2 = 0.30
log 3 = 0.48
log 5 = 0.70

Given --
Answer :

Question Type : **SA**
Question ID : **695278299**
Status : **Not Answered**

Q.74 A non-volatile, non-electrolyte solid solute when dissolved in 40 g of a solvent, the vapour pressure of the solvent decreased from 760 mm Hg to 750 mm Hg. If the same solution boils at 320 K, then the number of moles of the solvent present in the solution is _____. (Nearest integer)
[Given: boiling point of the pure solvent = 319.5 K,
K_b of the solvent = 0.3 K kg mol^{-1}]

Given --
Answer :

Question Type : **SA**
Question ID : **695278300**
Status : **Not Answered**

Q.75 According to Lewis theory, the total number of σ bond-pairs and lone pair of electrons around the central atom of XeO_6^{4-} ion is _____.

Given Answer : **12**

Question Type : **SA**
Question ID : **695278296**
Status : **Answered**

Exam Summary

B. Tech

Section Name	No. of Questions	Answered	Not Answered	Marked for Review	Answered & Marked for Review	Not Visited
Mathematics Section A	20	7	13	0	0	0
Mathematics Section B	5	0	5	0	0	0
Physics Section A	20	14	6	0	0	0
Physics Section B	5	2	3	0	0	0
Chemistry Section A	20	15	5	0	0	0
Chemistry Section B	5	1	4	0	0	0

"