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125 Questions

Que. 1 If $f(x) = \frac{\cos^2 x}{1+\sin^2 x}$, then the value $f\left(\frac{\pi}{4}\right) - 3f'\left(\frac{\pi}{4}\right)$ is

1. 0
2. 1
3. 3
4. 4

Correct Option - **3**

Que. 2 If a, b, c are three non-coplanar vectors, such that $\left[\vec{b} \times \vec{c}, \vec{c} \times \vec{a}, \vec{a} \times \vec{b}\right] = 2\left[\vec{a}, \vec{b}, \vec{c}\right]$, then the value of $[\vec{a}, \vec{b}, \vec{c}]$is equal to

1. 0
2. 1
3. 2
4. 4

Correct Option - **3**

Que. 3 Mohan is father of 3 children with atleast one boy. The probability that he has 2 boys and 1 girl is

1. 1/2
2. 1/3
3. 1/4
4. 2/3

Correct Option - **2**

Que. 4 If sum of n terms of an arithmetical progression is $5n^2 - 3n$, then its p^{th} term is.

1. 10p + 8
2. 10p - 8
3. 10p + 3
4. 10p - 3

Correct Option - **2**

Que. 5

If each force $\vec{F_1} + \vec{F_2}$ and $\vec{F_1} - \vec{F_2}$ has magnitude $\sqrt{\vec{F_1^2} + \vec{F_2^1}}$ then the angle between $\vec{F_1}$ and $\vec{F_2}$ is

1. 90°
2. 60°
3. 45°
4. 0°

Correct Option - **1**

Que. 6 Which of the following series converges?

I. $\sum_{n=1}^{\infty} \frac{3+\cos n}{e^n}$

II. $\sum_{n=1}^{\infty} \cos\left(\frac{1}{n}\right)$

1. I only
2. II only
3. I and II both
4. neither I no II

Correct Option - **1**

Que. 7 If three forces, acting at a point, be in equilibrium then each force is proportional to the sine of the angle between the other two. This theorem is called

1. Law of triangle of forces
2. Law of parallelogram of forces
3. Lami's theorem
4. Trigonometrical theorem

Correct Option - **3**

Que. 8 A sum of money doubles itself in 4 years at compound interest. It will amount to 8 times to itself at the same rate of interest in time

1. 12 years
2. 16 years
3. 18 years
4. 24 years

Correct Option - **1**

Que. 9 Which one of the following is true?

1. mean = 3 median - 2 mode
2. median = 3 mode - 2 mean
3. mode = 2 median - 3 mean
4. mode = 3 median - 2 mean

Correct Option - **4**

Que. 10 If the geometric mean of two numbers is 6.0 and the arithmetic mean is 6.5, then the difference of squares of these numbers is

1. 65
2. 120
3. 130
4. 140

Correct Option - **1**

Que. 11 The smallest number among the numbers 2^{250}, 3^{150}, 5^{100}, 4^{200} is

1. 4^{200}
2. 5^{100}
3. 3^{150}
4. 2^{250}

Correct Option - **2**

Que. 12 If a:$b = \frac{2}{9} : \frac{1}{3}$, b : c = $\frac{2}{7} : \frac{5}{14}$ and $d : c = \frac{7}{10} : \frac{3}{5}$, then a : b : c : d = ?

1. 2 : 3 : 5 : 7
2. 3 : 15 : 7 : 40
3. 16 :24 : 30 : 35
4. 18 : 24 : 30 : 49

Correct Option - **3**

Que. 13 If ${}^{9}P_5 + 5.\ {}^{9}P_4 = {}^{10}P_r$, then the value of r is

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

Correct Option - **3**

Que. 14 The value of the determinant

$$\begin{vmatrix} -a^2 & ab & ac \\ ab & -b^2 & bc \\ ac & bc & -c^2 \end{vmatrix}$$

1. 0
2. $-(a^2 + b^2 + c^2)$
3. $4a^2 b^2 c^2$
4. $2(ac + bc + ca)$

Correct Option - **3**

Que. 15 Sum of the series $\frac{1}{2!} + \frac{1}{4!} + \frac{1}{6!} + \ldots\ldots\ldots$

1. $\frac{(e+1)^2}{2e}$
2. $\frac{(e-1)^2}{2e}$
3. $\frac{\left(e^2-1\right)}{2e}$
4. $\frac{e^2+1}{2e}$

Correct Option - **2**

Que. 16 If the mapping f and g are given by

f = {(1, 2), {3, 5), (4, 1)}

g = {(2, 3), {5, 1), (1, 3)}

then gof is

1. {(2, 5), (5, 2), (1, 5)}
2. {(1, 2), (3, 5), (4, 1)}
3. {(1, 3), (3, 1), (4, 3)}
4. {(2, 3), (5, 1), (1, 3)}

Correct Option - **3**

Que. 17 In how many ways the letter of the word BALLOON be arranged so that two L do not come together?

1. 1260
2. 360
3. 900
4. 1060

Correct Option - **3**

Que. 18 The sequence $\left\{\frac{\sin\frac{nx}{2}}{n}\right\}^{\infty}$ converges to

1. 0
2. 1
3. π
4. -1

Correct Option - **1**

Que. 19 The value of $\frac{\sin 75^\circ - \sin 15^\circ}{cos75^\circ + cos15^\circ}$ is

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

Correct Option - **3**

Que. 20 The value of $\sin(\cot^{-1}(\tan(\cos^{-1} x)))$

1. 3
2. $\sqrt{1-x^2}$
3. π
4. x

Correct Option - **4**

Que. 21 If A + iB = tan (x + iy), then the value of tan 2x is?

1. $\frac{2A}{1+A^2+B^2}$
2. $\frac{2A}{1-A^2+B^2}$

3. $\frac{2A}{1-A^2-B^2}$
4. None of these

Correct Option - **3**

Que. 22 If cos (A + B) = $\frac{3}{5}$ and sin (A - B) = $\frac{5}{13}$, where $0 \leq A, B \leq \frac{\pi}{4}$, then tan 2B is equal to

1. $\frac{11}{34}$
2. $\frac{21}{56}$
3. $\frac{33}{56}$
4. 1

Correct Option - **3**

Que. 23 AB is a chord of a circle and AOC is its diameter such that ∠ACB = 50°, if AT is tangent to the circel at the point A, then ∠BAT is equal to

1. 50°
2. 60°
3. 65°
4. None of these

Correct Option - **1**

Que. 24 The curve represented by the equations
x = 3(cost + sint)
y = 4(cost - sint) is

1. A straight line
2. A circle
3. A hyperbola
4. An ellipse

Correct Option - **4**

Que. 25 The equation of sphere is $x^2 + y^2 + z^2 - x + z - 2 = 0$, its radius is

1. $\frac{\sqrt{5}}{2}$
2. $\sqrt{\frac{5}{2}}$

3. $\frac{5}{\sqrt{2}}$
4. 5

Correct Option - **2**

Que. 26 If the straight line x cosα + y sinα = p is tangent to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$. then

1. $p^2 = \frac{a^2b^2}{4}$
2. $p^2 = a^2 \cos^2 \alpha - b^2 \sin^2 \alpha$
3. $p^2 = a^2 \cos^2 \alpha + b^2 \sin^2$
4. None of these

Correct Option - **3**

Que. 27 Lines x = ay + b, z = cy + d

and x = a'y + b', z = c'y + d'

are perpendicular, if

1. aa' + cc' + 1 = 0
2. aa' + cc' - 1 = 0
3. ac + a'c' -1 = 0
4. ac + a'c' + 1 = 0

Correct Option - **1**

Que. 28 If $2x - y = 5$, then $(2x - 3)^3 - (y + 2)^3$ is equal to

1. 0
2. 25
3. 40
4. 125

Correct Option - **1**

Que. 29 The angle of intersection of the curves $y = 4 - x^2$ and $y = x^2$ is

1. $tan^{-1}(\frac{4\sqrt{2}}{7})$
2. $tan^{-1}(\frac{2}{7})$
3. $tan^{-1}(\frac{3\sqrt{2}}{7})$

4. $\frac{\pi}{2}$

Correct Option - **1**

Que. 30 The area of the region bounded by the curves $y^2 = x$ and $x^2 = y$ is

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

Correct Option - **1**

Que. 31 $\frac{d}{dx}(tan(cos^{-1}x))^2$ is equal to

1. $-2/x^3$
2. $2/x^3$
3. $\frac{\sqrt{1-x^2}}{x}$
4. $-\frac{x}{\sqrt{1-x^2}}$

Correct Option - **1**

Que. 32 $\sqrt{3+2\sqrt{2}} - \sqrt{3-2\sqrt{2}}$ is equal to

1. 1
2. $\sqrt{3}+1$
3. $\sqrt{3}-1$
4. 2

Correct Option - **4**

Que. 33 Which one of the following is not true?

1. $|\vec{a}| = |\vec{b}| \Rightarrow \vec{a} = \vec{b}$
2. $\left|\vec{a} \times \vec{b}\right|^2 = (\vec{a})^2(\vec{b})^2 - (\vec{a}.\vec{b})^2$
3. $\vec{a} \times (\vec{b} \,.\, \vec{c})$

4. If the adjacent sides of a parallelogram are represented by the vectors $\vec{a}$ and $\vec{b}$ respectively, then its area is $|\vec{a} \times \vec{b}|$

Correct Option - **1**

Que. 34 A particle is projected with velocity u at an inclination θ with the horizontal. Then Maximum height (H) attained is

1. $\frac{u^2 sin^2\theta}{g}$
2. $\frac{2u^2 sin^2\theta}{g}$
3. $\frac{u^2 sin^2\theta}{2g}$
4. $\frac{u^2 sin2\theta}{g}$

Correct Option - **3**

Que. 35 If $\begin{vmatrix} x+2 & 2 & 2 \\ 2 & x+2 & 2 \\ 2 & 2 & x+2 \end{vmatrix} = 0$, then values of x satisfying this equation are

1. 0, -2, -6
2. 0, -1, -2
3. 0, 0, -2
4. 0, 0, -6

Correct Option - **4**

Que. 36 Series $\sum_{n=1}^{\infty} \left(\left(\frac{n+1}{n} \right)^{n+1} - \frac{n+1}{n} \right)^{-n}$ is

1. divergent
2. convergent
3. oscillates finitely
4. oscillates infinitely

Correct Option - **2**

Que. 37 $10^2 + 11^2 + 12^2 + ... + 19^2$ is equal to

1. 1580
2. 2010

3. 2121
4. 2185

Correct Option - **4**

Que. 38 The resultant force of two forces P and Q is R. If Q is doubled, R is doubled and if Q is reversed, R is again doubled. Then which one is the true relation?

1. $\frac{P}{\sqrt{2}} = \frac{Q}{\sqrt{3}} = \frac{R}{\sqrt{2}}$
2. $\frac{P}{1} = \frac{Q}{2} = \frac{R}{1}$
3. $\frac{P}{\sqrt{3}} = \frac{Q}{\sqrt{2}} = \frac{R}{\sqrt{2}}$
4. $\frac{P}{1} = \frac{Q}{1} = \frac{R}{\sqrt{2}}$

Correct Option - **1**

Que. 39 The compound interest on Rs. 8,000 @ 10% per annum for 1.5 years, if the interest is calculated half yearly is

1. Rs. 9,261
2. Rs. 860
3. Rs. 961
4. Rs. 1,261

Correct Option - **4**

Que. 40 If the mean of 10 observations $x_1, x_2, x_3, \ldots x_{10}$ is 20, then mean of $x_1 + 2, x_2 + 4, x_3 + 6, \ldots x_{10} + 20$ is

1. 24
2. 28
3. 31
4. 32

Correct Option - **3**

Que. 41 For showing the growth of population for the last 8 years, the best diagram is

1. pie
2. histogram
3. scatter plot
4. simple bar diagram

Correct Option - **4**

Que. 42 If non - zero a, b, c are such that a + b + c = 0, then the value of $\frac{a^2}{bc} + \frac{b^2}{ac} + \frac{c^2}{ab}$ is

1. 3
2. 2
3. -3
4. 0

Correct Option - **1**

Que. 43 If $x + \frac{1}{x} = \sqrt{3}$, then the value of $x^{18} + x^{12} + x^6 + 1$ is

1. 0
2. 1
3. 2
4. 3

Correct Option - **1**

Que. 44 Factorisation of $x^3 - y^3$ is

1. $(x + y)(x^2 - xy + y^2)$
2. $(x - y)(x^2 - xy + y^2)$
3. $(x - y)(x^2 - xy - y^2)$
4. $(x - y)(x^2 + xy + y^2)$

Correct Option - **4**

Que. 45 The roots of the equation $x^3 - 12x^2 + 39x - 28 = 0$ are in A. P., the common difference is

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

Correct Option - **2**

Que. 46 If $A = \begin{bmatrix} coshx & sinhx \\ -sinhx & coshx \end{bmatrix}$, then trace (A^2) is equal to

1. 2
2. -2
3. cosh 2x
4. sinh 2x

Correct Option - **1**

Que. 47 If x - 1 and x + 3 are the two factors of $x^3 + ax + b$, then remaining factor is

1. x + 2
2. x - 2
3. x - 3
4. x + 1

Correct Option - **2**

Que. 48 If A is an open set and B is a closed set, then B - A is

1. Open set
2. Closed set
3. Both open and closed set
4. None of these

Correct Option - **2**

Que. 49 $\lim_{y \to a} (\sin\frac{y-a}{2} \tan\frac{\pi y}{2a})$ is equal to

1. 0
2. 1
3. $\frac{\pi}{a}$
4. $-\frac{a}{\pi}$

Correct Option - **4**

Que. 50 The value of sin 18° is

1. $\frac{\sqrt{5}-1}{4}$
2. $\frac{\sqrt{5}+1}{4}$
3. $\frac{\sqrt{5}-1}{2}$
4. $\frac{\sqrt{5}+1}{2}$

Correct Option - **1**

Que. 51 If $\sin^2(x + iy) = A + iB$, then value of A is

1. $\frac{1}{2}(1 + cos2x\ cosh\ 2y)$
2. $\frac{1}{2}(1 - cos2x\ cosh\ 2y)$
3. $\frac{1}{2}(sin2x\ sinh\ 2y)$
4. $-\frac{1}{2}(sin2x\ sinh\ 2y)$

Correct Option - **2**

Que. 52 The general solution of sinx + cosx = 1 is given by

1. $x = 2n\pi$
2. $x = 2n\pi + \frac{\pi}{2}$
3. $x = n\pi + (-1)^n\frac{\pi}{4} - \frac{\pi}{4}$
4. None of these

Correct Option - **3**

Que. 53 In an equilateral triangle, the ratio of the radius of circumcircle to that of incircle is

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

Correct Option - **4**

Que. 54 The tangent at a point C of a circle and diameter AB when extended intersect at D, if $\angle DCA = 110°$, then $\angle CBA$ is equal to

1. 60°
2. 70°
3. 55°
4. 110°

Correct Option - **2**

Que. 55 The equation of a normal to the parabola $y^2 = 4x$ which passes through the point (6, 0) is

1. y + 2x = 12
2. y - 2x = 12
3. y + 2x = 6

4. $y - 2x = 6$

Correct Option - **1**

Que. 56 The equation $6x^2 - 5xy - 6y^2 + 14x + 5y + 4 = 0$ represents

1. A circle
2. A hyperbola
3. An ellipse
4. A pair of perpendicular straight lines

Correct Option - **4**

Que. 57 The conic $x^2 + xy + 2y^2 + x + y = 1$ is

1. an ellipse
2. a hyperbola
3. a parabola
4. a pair of straight lines

Correct Option - **1**

Que. 58 If y-axis is generator line of the cone $ax^2 + by^2 + cz^2 + 2fyz + 2gzx + 2hxy = 0$, then value of b is equal to

1. 1
2. -1
3. 0
4. None of these

Correct Option - **3**

Que. 59 The second degree equation $2x^2 + 2y^2 - 2x - 6y + 5 = 0$ represents

1. a circle
2. an ellipse
3. a point
4. none of the above

Correct Option - **3**

Que. 60 The equation of the normal at the point (1, 1) on the curve $2y + x^2 = 3$ is

1. $x + y = 0$
2. $x + y + 1 = 0$
3. $x - y = 0$

4. $x - y = 1$

Correct Option - **3**

Que. 61 The value of $\int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \frac{dx}{\sin^2 x \cos^2 x}$ is

1. 1
2. 0
3. $\frac{2}{\sqrt{3}}$
4. $\frac{1}{\sqrt{3}}$

Correct Option - **3**

Que. 62 $\int_{-1}^{2} x|x|\,dx$ is equal to

1. 0
2. 2/3
3. 5/3
4. 7/3

Correct Option - **4**

Que. 63 H.C.F. of $x^3 - x^2 + 4x - 4$ and $x^6 - 1$ is

1. $x + 1$
2. $x - 1$
3. $x^2 - 1$
4. $x^3 - 1$

Correct Option - **2**

Que. 64 The value of 'a' such that the vector $2\hat{i} - \hat{j} + \hat{k}$, $\hat{i} + 2\hat{j} - 3\hat{k}$ and $3\hat{i} + a\hat{j} + 5\hat{k}$ are coplanar, is

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

Correct Option - **4**

Que. 65 A particle is projected in vertically upward direction, If after t_1 and t_2 time, its height is h, then h is equal to

1. $\frac{1}{2}gt_1t_2$
2. $g\sqrt{t_1t_2}$
3. $2g(t_1 + t_2)$
4. none of these

Correct Option - **1**

Que. 66 If $A = \begin{bmatrix} 1 & 3+x & 2 \\ 1-x & 2 & y+1 \\ 2 & 5-y & 3 \end{bmatrix}$ is a symmetric matrix, then 3x + y is equal to?

1. -1
2. 0
3. 1
4. none of these

Correct Option - **1**

Que. 67 If in any projectile maximum height is equal to horizontal range, then the angle of projection is

1. $tan^{-1}\frac{1}{4}$
2. $tan^{-1}\frac{1}{2}$
3. $tan^{-1}2$
4. $tan^{-1}4$

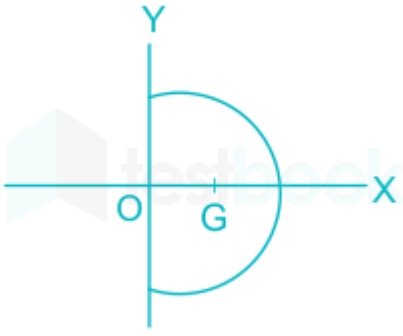
Correct Option - **4**

Que. 68 If ω is a complex cube root of unit, then $1 + \omega + \omega^2 + ... + \omega^{100}$ is equal to

1. 0
2. $1 + \omega$
3. $1 - \omega$
4. ω

Correct Option - **2**

Que. 69 The center of gravity of the semi-circular disc of radius 'a' is



1. $\left(\frac{2a}{\pi}, 0\right)$
2. $\left(\frac{3a}{4\pi}, 0\right)$
3. $\left(\frac{4a}{3\pi}, 0\right)$
4. $\left(\frac{a}{2}, \frac{a}{2}\right)$

Correct Option - **3**

Que. 70 When a train travels with speed $\left(\frac{3}{5}\right)^{th}$ of its normal speed. it reaches its destination 4 hours late. what is the time taken by the train in travelling this distance with its normal speed ?

1. 3 hours
2. 6 hours
3. 4 hours
4. 5 hours

Correct Option - **2**

Que. 71 A 75 meter long train is moving at 20 km/hr. It will cross a man standing on the platform in time

1. 12 seconds
2. 14 seconds
3. 13.5 seconds
4. 15.5 seconds

Correct Option - **3**

Que. 72 Three dice are thrown randomly. The probability of coming 3 in at least one die is

1. 180/216

2. 91/216
3. 5/216
4. 125/216

Correct Option - **2**

Que. 73 If the algebraic sum of the deviations of 10 observations measured from 15 is 7, then the mean is

1. 105
2. 70
3. 15.7
4. 16.7

Correct Option - **3**

Que. 74 The equations $2x - ky + 7 = 0$ and $6x - 12y + 15 = 0$ have no solution for

1. $k = -4$
2. $k = 4$
3. $k = 1$
4. $k = -1$

Correct Option - **2**

Que. 75 If $a + b + c = 5$ and $ab + bc + ca = 10$, then the value of $a^3 + b^3 + c^3 - 3abc$ is

1. -25
2. 25
3. 0
4. 75

Correct Option - **1**

Que. 76 If $\log_x 4 + \log_x 16 + \log_x 64 = 12$, the value of x is

1. 2
2. 4
3. 5
4. 10

Correct Option - **1**

Que. 77 If a, b, c are in A. P. and x, y, z are in G. P., then the value of $x^{b-c} y^{c-a} z^{a-b}$ is

1. 0

2. 1
3. 2
4. -1

Correct Option - **2**

Que. 78 $\frac{1}{\log_2 x}+\frac{1}{\log_3 x}+\frac{1}{\log_4 x}+\ldots.+\frac{1}{\log_{50} x}, x \neq 1$ is equal to

1. $\frac{50}{\log_{50} x}$
2. $\frac{49}{\log_{49} x}$
3. $\frac{1}{\log_{50!} x}$
4. $\frac{1}{\log_{49!} x}$

Correct Option - **3**

Que. 79 If G is a group of even order, then an element $a \neq e$, satisfying

1. $a^2 = e$
2. $a^3 = e$
3. $a^5 = e$
4. $a^7 = e$

Correct Option - **1**

Que. 80 $\lim\limits_{x \to 1} \frac{1-\sqrt{x}}{\cos^{-1} x}$ is equal to

1. 0
2. $\frac{1}{2}$
3. $\frac{1}{4}$
4. 1

Correct Option - **1**

Que. 81 The value of $\sum\limits_{r=1}^{9} \sin^2\left(\frac{r\pi}{18}\right)$ is

1. 1

2. 0
3. 5
4. π

Correct Option - **3**

Que. 82 In the equation

$$\cos^{-1}\left(\frac{1-a^2}{1+a^2}\right) - \cos^{-1}\left(\frac{1-b^2}{1+b^2}\right) = 2\tan^{-1}x$$

value of x is

1. $\frac{a+b}{1+ab}$
2. $\frac{a-b}{1+ab}$
3. $\frac{a-b}{1-ab}$
4. None of the above

Correct Option - **2**

Que. 83 The polar form of -1 - √(-3) is

1. $2(\cos\frac{2\pi}{3} - i\sin\frac{2\pi}{3})$
2. $2(\cos\frac{\pi}{3} + i\sin\frac{\pi}{3})$
3. $2(\cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3})$
4. $2(\cos\frac{\pi}{3} - i\sin\frac{\pi}{3})$

Correct Option - **1**

Que. 84 If the side of a right angle triangle are a, ar, ar^2 ($r < 1$), then r^2 is equal to

1. $\frac{\sqrt{5}-1}{2}$
2. $\frac{\sqrt{5}+1}{2}$
3. $\sqrt{5} - 1$
4. $\sqrt{5} + 1$

Correct Option - **1**

Que. 85 If f(x) = cos hx + sin hx, then which one of the following is correct?

1. f(x) f(y) = f(x) + f(y)
2. f(x) f(y) = f(xy)
3. f(x) f(y) = f(x + y)
4. $f(x)f(y) = f(\frac{x}{y})$

Correct Option **- 3**

Que. 86 The equation of the base of an equilateral triangle is x + y = 1 and its vertex is (1, -1), length of its side is

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

Correct Option **- 3**

Que. 87 If a straight line makes angles α, β and γ with the co-ordinate axes, then $\sin^2\alpha + \sin^2\beta + \sin^2\gamma$ is equal to

1. 0
2. 1
3. 2
4. None of these

Correct Option **- 3**

Que. 88 If the equation

$3x^2 + 7xy + 2y^2 + 5x + 5y + k = 0$

represents a pair of straight lines, then the value of k is

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

Correct Option **- 2**

Que. 89 The number of spheres that can be made to pass through the three given points (1, 0, 0), (0, 1, 0) and (0, 0, 1) is

1. 1
2. 2
3. 3
4. Infinite

Correct Option - **4**

Que. 90 The length of the common chord of two circles of radii 15 cm and 20 cm, whose centres are 25 cm apart, is (in cm)

1. 10
2. 12
3. 20
4. 24

Correct Option - **4**

Que. 91 $\lim_{n\to\infty}\left(1-\frac{1}{2n}\right)^{n+1}$ is equal to

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

Correct Option - **2**

Que. 92 The derivative of the function y = 3|x| + 1 at the point x = 0 is

1. 3
2. -3
3. 0
4. not existing

Correct Option - **4**

Que. 93 The area enclosed between the curves $y = \sin x, y = \cos x, 0 \le x \le \frac{\pi}{2}$ is

1. $\sqrt{2}-1$
2. $\sqrt{2}+1$
3. $2(\sqrt{2}-1)$

4. $2(\sqrt{2}+1)$

Correct Option - **3**

Que. 94 If y(x) is a solution of the differential equation $\frac{dy}{dx} + 4xy = x^3, y(0) = 0$ then $\lim_{x \to 0} y(x)$ is

1. 0
2. -2
3. 1
4. not existing

Correct Option - **1**

Que. 95 Two forces $\bar{F}_1 = \hat{i} - \hat{j} + \hat{k}$ and $\bar{F}_2 = 4\hat{i} + 2\hat{j} + 3\hat{k}$ act on a particle and displace it from the point (0, 1, 2) to (1, -2, 3), then the total work done is

1. 2 unit
2. 6 unit
3. 4 unit
4. 8 unit

Correct Option - **2**

Que. 96 The moment of the force $3\hat{i} + 4\hat{j} - 5\hat{k}$ acting through the point $\hat{i} - 2\hat{j}$ about the point $\hat{i} - \hat{j} + \hat{k}$ is

1. $6\hat{i} + 2\hat{j} - 5\hat{k}$
2. $8\hat{i} + 2\hat{j} - \hat{k}$
3. $9\hat{i} + 3\hat{j} - 8\hat{k}$
4. $9\hat{i} - 3\hat{j} + 3\hat{k}$

Correct Option - **4**

Que. 97 Value of the integral $\int_{-1}^{1} \log\frac{2-x}{2+x} dx$ is

1. 2
2. 1
3. 0
4. $\frac{1}{2}$

Correct Option - **3**

Que. 98 If the foot of the perpendicular drawn from (-2, 1, 0) on a plane is (1, -2, 1), then the equation of the plane is

1. $3x + 3y + z = 10$
2. $3x + 3y - z = 10$
3. $3x - 3y + z = 10$
4. $3x - 3y - z = 10$

Correct Option - **3**

Que. 99 If $\hat{a}$, $\hat{b}$ and $\hat{c}$ are unit vectors and $|\hat{a} + \hat{b}|^2 = |\hat{b} + \hat{c}|^2 = |\hat{c} + \hat{a}|^2 = 8$, then $|2\hat{a} + \hat{b} + \hat{c}|$ is equal to

1. 2
2. 4
3. 6
4. none of the above

Correct Option - **3**

Que. 100 If $f'(x) = g(x)$ and $g'(x) = f(x^2)$, then $f''(x^2)$ is equal to

1. $g(x^2)$
2. $f(x^4)$
3. $f(x^3)$
4. $g(x^4)$

Correct Option - **2**

Que. 101 A and B work together and complete a given work in x days. If A alone completes this work in x + 2 days and B alone completes this work in x + 8 days, then the value of x is

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

Correct Option - **2**

Que. 102 A person travels from A to B at an average speed of x km/hr and returns from B to A at an average speed of y km/hr. His average speed during the total journey, is

1. $\frac{x+y}{2xy}$
2. $\frac{2xy}{x+y}$
3. $\frac{2}{x+y}$
4. $\frac{1}{x} + \frac{1}{y}$

Correct Option - **2**

Que. 103 How much will Rs. 25,000 amount to in 2 years at compound interest, if the rate of interest for successive years be 4% and 5% per year ?

1. Rs. 25,300
2. Rs. 26,300
3. Rs. 27,300
4. Rs. 28,300

Correct Option - **3**

Que. 104 If the median of the distribution 10, 12, 13, 16, x, 20, 25, 30, is 18, then the value of x is

1. 24
2. 22
3. 23
4. 20

Correct Option - **4**

Que. 105 If $x + \frac{9}{x} = 6$, then the value of x

1. 3
2. 12
3. 16
4. 10

Correct Option - **1**

Que. 106 Value of x in the equation $\frac{1}{x-3} - \frac{1}{x+5} = \frac{1}{6}$ are

1. 7, 9
2. -7, 9
3. -7, -9
4. 7, -9

Correct Option - **4**

Que. 107 In the expansion of $\left(3x - \frac{2}{x^2}\right)^{15}$ which term is free from x?

1. 4^{th}

2. 5^{th}
3. 6^{th}
4. 7^{th}

Correct Option - **3**

Que. 108 If $A = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$, then the value of AB is

1. $\begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$
2. $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$
3. $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$
4. $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

Correct Option - **4**

Que. 109 If $|x| < 1$, then $\frac{x^2}{2} + \frac{2x^3}{3} + \frac{3x^4}{4} + \ldots$ is equal to

1. $\frac{x}{1-x} + \log_e(1-x)$
2. $\frac{x}{1+x} + \log_e(1+x)$
3. $\frac{x}{1-x} + \log_e(1+x)$
4. $\frac{x}{1+x} + \log_e(1-x)$

Correct Option - **1**

Que. 110 Given:

Statement A: All cyclic groups are an abelian group.

Statement B: The order of the cyclic group is the same as the order of its generator.

1. A and B are false
2. A is true, B is false
3. B is true, A is false
4. A and B both are true

Correct Option - **4**

Que. 111 If $f(x) = \frac{x^2-3x+2}{x^2-2x}$, $x \neq 2$ is defined and function f(x) be continuous at x = 2, then the value of f(2) is

1. 0
2. 1/2
3. 1
4. 3/4

Correct Option - **2**

Que. 112 The function f(x) is defined by $f(x) = \begin{cases} \frac{|x|}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$ then, at x = 0 it is

1. Continuous
2. Discontinuous at x = 0 and has discontinuity of first kind
3. Discontinuous at x = 0 and has removable discontinuity
4. Discontinuous at x = 0 and has discontinuity of second kind

Correct Option - **2**

Que. 113 The value of $\cot\left(cosec^{-1}\frac{5}{3} + \tan^{-1}\frac{2}{3}\right)$

1. 5/17
2. 3/17
3. 4/17
4. 6/17

Correct Option - **4**

Que. 114 If r_1, r_2, r_3 are ex-radii and r the in-radius of triangle ABC and $r_1 = r + r_2 + r_3$, then triangle ABC is

1. Isoscales triangle
2. Equilateral triangle
3. Right angled triangle
4. None of these

Correct Option - **3**

Que. 115 If $\sin\theta \cos\theta = 1/2$, then the value of $\sin^6\theta + \cos^6\theta$ is

1. 1/2
2. 3/2
3. 1
4. 1/4

Correct Option - **4**

Que. 116 If ω is cube root of unity, then $(3 + \omega + 3\omega^2)^6$ is equal to

1. 32
2. 64
3. 128
4. 16

Correct Option - **2**

Que. 117 If AB is diameter of the circle $x^2 + y^2 + 2x + 4y - 3 = 0$. If co-ordinates of A are (1, 0), then co-ordinates of B are

1. (-3, 1)
2. (-3, 2)
3. (-3, 3)
4. (-3, -4)

Correct Option - **4**

Que. 118 The eccentricity of the ellipse, whose latus rectum is half of its minor axis is

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

Correct Option - **2**

Que. 119 The angle between the straight lines represented by the equation $y^2 - xy - 6x^2 = 0$ is

1. 30°
2. 60°
3. 45°
4. 65°

Correct Option - **3**

Que. 120 In the conic $\frac{l}{r} = 1 + e\cos\theta$, the sum of the reciprocals of the segments of any focal chord is

1. 1/l
2. 3/l
3. 4/l
4. 2/l

Correct Option - **4**

Que. 121 The co-ordinates of the mid points of sides of a triangle are (5, 2), (3, 3) and (2, 2). What is co-ordinates of its centroid is

1. $\left(\frac{7}{3}, \frac{10}{3}\right)$
2. $\left(\frac{10}{3}, \frac{7}{3}\right)$
3. $\left(\frac{7}{3}, \frac{2}{3}\right)$
4. $\left(\frac{2}{3}, \frac{7}{3}\right)$

Correct Option - **2**

Que. 122 In a geometric progression, first term is 7, the last term is 448 and the sum is 889. The common ratio of the geometric progression is

1. 3/2
2. 2
3. 3
4. 3.5

Correct Option - **2**

Que. 123 The value of $\int_0^{\frac{\pi}{2}} \frac{\sin x dx}{\sin x + \cos x}$

1. 1
2. π/2
3. π/4

4. $\pi/6$

Correct Option **- 3**

Que. 124 The solution of the differential equation $\left(x + 2y^3\right)\frac{dy}{dx} = y$ is

1. $x = y^3 - cy^2$
2. $x = y^3 + cy$
3. $y = x^3 + cx$
4. $y = x^3 - cx^2$

Correct Option **- 2**

Que. 125 Solution of the differential equation $(1 + 3x)dy - (1 - 3y)dx = 0$, $y(1) = 0$ is

1. $x + y + 3xy = 1$
2. $x - y + 3xy = 1$
3. $x - y - 3xy = 1$
4. $x + y - 3xy = 1$

Correct Option **- 3**