AIEEE Solved Paper - 2011

Mathmatics

MATHEMATICS

61. Let α, β be real and z be a complex number. If $z^2 + \alpha z + \beta = 0$ has two distinct roots on the line Re z = 1, then it is necessary that:

(1) $\beta \in (0, 1)$ (2) $\beta \in (-1, 0)$
(3) $|\beta| = 1$ (4) $\beta \in (1, \infty)$

Key: (4)

Sol.: Let roots be 1 + ia and 1 - ia

So (1 + ia) + (1 - ia) = $-\alpha$

and (1 + ia) (1 - ia) = β

$\Rightarrow \beta = 1 + a^2$

$\Rightarrow \beta \in (1, \infty)$

62. The value of $\int_0^1 \frac{8\log(1+x)}{1+x^2}dx$ is

(1) $\pi \log 2$ (2) $\frac{\pi}{8}\log 2$
(3) $\frac{\pi}{2}\log 2$ (4) $\log 2$

Key: (1)

Sol.: $I = \int_0^1 \frac{8\log(1+x)}{1+x^2}dx$

Let $x = \tan\theta \Rightarrow dx = \sec^2\theta\, d\theta$

$I = \int_0^{\pi/4} 8\log(1+\tan\theta)\,d\theta$

$I = 8\int_0^{\pi/4} \log\left(1+\tan\left(\frac{\pi}{4}-\theta\right)\right)d\theta$

$= 8\int_0^{\pi/4} \log\left(\frac{2}{1+\tan\theta}\right)d\theta$

$= 8\left[\int_0^{\pi/4} \left(\log 2 - \log(1+\tan\theta)\right)d\theta\right]$

$I = 4\int_0^{\pi/4} \log 2\, d\theta = \pi\log 2$

63. $\frac{d^2x}{dy^2}$ equals

(1) $\left(\frac{d^2y}{dx^2}\right)^{-1}$ (2) $-\left(\frac{d^2y}{dx^2}\right)^{-1}\left(\frac{dy}{dx}\right)^{-3}$
(3) $\left(\frac{d^2y}{dx^2}\right)\left(\frac{dy}{dx}\right)^{-2}$ (4) $-\left(\frac{d^2y}{dx^2}\right)\left(\frac{dy}{dx}\right)^{-3}$

Key: (4)

Sol.: $\frac{d^2x}{dy^2} = \frac{d}{dy}\left(\frac{dx}{dy}\right) = \frac{d}{dy}\left(\left(\frac{dy}{dx}\right)^{-1}\right)$

$= \frac{d}{dx}\left(\left(\frac{dy}{dx}\right)^{-1}\right)\ \frac{dy}{dx}^{-1}\left(\quad\right)$

$= -\left(\frac{d^2y}{dx^2}\right) \cdot \left(\frac{dy}{dx}\right)^{-3}$

64. Let I be the purchase value of an equipment and V(t) be the value after it has been used for t years. The value V(t) depreciates at a rate given by differential equation $\frac{dV(t)}{dt} = -k(T-t)$, where k > 0 is a constant and T is the total life in years of the equipment. Then the scrap value V(T) of the equipment is

(1) $T^2 - \frac{1}{k}$ (2) $I - \frac{kT^2}{2}$
(3) $I - \frac{k(T-t)^2}{2}$ (4) e^{-kT}

Key (2)

Sol.: $\frac{dV(t)}{dt} = -k\,(T-t)$

$V(t) = \frac{k(T-t)^2}{2} + c$

at t = 0, V(t) = I $\Rightarrow V(t) = I + \frac{k}{2}(t^2 - 2tT)$

$V(T) = I + \frac{k}{2}(T^2 - 2T^2)$

$= I - \frac{K}{2}T^2$

65. The coefficient of x^7 in the expansion of $(1 - x - x^2 + x^3)^6$ is

(1) 144 (2) - 132
(3) - 144 (4) 132

Key: (3)

Sol.: $(1 - x + x^2 + x^3)^6 = (1 - x)^6 (1 - x^2)^6$

$= (1 - 6x + 15x^2 - 20x^3 + 15x^4 - 6x^5 + x^6)$

$x(1 - 6x^2 + 15x^4 - 20x^6 + 15x^8 - 6x^{10} + x^{12})$

coefficient of x^7 = (-6) (-20) + (-20) (15) + (-6) (-6)

= 120 - 300 + 36

= -144

66. For $x \in \left(0, \frac{5\pi}{2}\right)$, define $f(x) = \int_0^x \sqrt{t}\ \sin t\ dt$. Then f has

(1) local maximum at π and 2π

(2) local minimum at π and 2π

(3) local minimum at π and local maximum at 2π

(4) local maximum at π and local minimum at 2π

Key: (4)

Sol.: $f(x) = \int_0^x \sqrt{t}\sin t\, dt$

$f'(x) = \sqrt{x}\ \sin x$

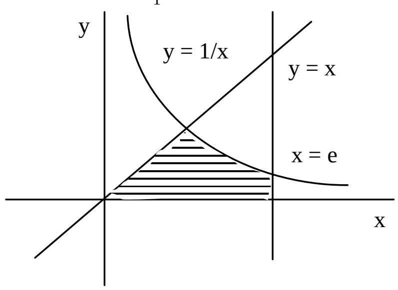
+	−	+	
0	π	2π	$5\pi/2$

f(x) has local maximum at π and local minima at 2π

67. The area of the region enclosed by the curves y = x, x = e, y = 1/x and the positive x-axis is
(1) 1/2 square units (2) 1 square units
(3) 3/2 square units (4) 5/2 square units

Key: (3)

Sol.: Area = 1/2 + $\int_1^e \frac{1}{x}dx$

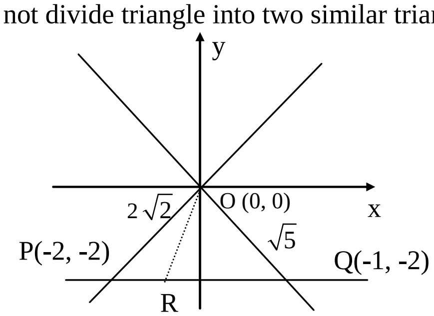


$= \frac{1}{2} + \ln|x|\Big|_1^e = \frac{3}{2}$

68. The line L_1 : y - x = 0 and L_2 : 2x + y = 0 intersect the line L_3 : y + 2 = 0 at P and Q respectively. The bisector of the acute angle between L_1 and L_2 intersects L_3 at R.
Statement-1:
The ratio PR : RQ equals $2\sqrt{2} : \sqrt{5}$
Statement-2:
In any triangle bisector of an angle divides the triangle into two similar triangles.
(1) Statement-1 is true, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.
(2) Statement-1 is true, Statement-2 is true, Statement-2 is not a correct explanation for Statement-1.
(3) Statement-1 is true, Statement-2 is false.
(4) Statement-1 is false, Statement-2 is true.

Key: (3)

Sol.: In ΔOPQ angle bisector of O divides PQ in the ratio of OP : OQ which is $2\sqrt{2} : \sqrt{5}$ but it does not divide triangle into two similar triangles.



69. The values of p and q for which the function

$$f(x) = \begin{cases} \frac{\sin(p+1)x + \sin x}{x} & , \quad x < 0 \\ q & , \quad x = 0 \\ \frac{\sqrt{x + x^2} - \sqrt{x}}{x^{3/2}} & , \quad x > 0 \end{cases}$$ is

continuous for all x in R, are
(1) $p = \frac{1}{2}, q = -\frac{3}{2}$ (2) $p = \frac{5}{2}, q = \frac{1}{2}$
(3) $p = -\frac{3}{2}, q = \frac{1}{2}$ (4) $p = \frac{1}{2}, q = \frac{3}{2}$

Key: (3)

Sol.: $$f(x) = \begin{cases} \frac{\sin(p+1)x + \sin x}{x} & , \quad x < 0 \\ q & , \quad x = 0 \\ \frac{\sqrt{x + x^2} - \sqrt{x}}{x^{3/2}} & , \quad x > 0 \end{cases}$$

$\lim_{x \to 0^-} f(x) = \lim_{x \to 0^+} \frac{\sin(p+1)x + \sin x}{x} = p + 2$

$\lim_{x \to 0^+} f(x) = \frac{1}{2} \Rightarrow p + 2 = q = \frac{1}{2}$

$\Rightarrow p = -\frac{3}{2}, q = \frac{1}{2}$

70. If the angle between the line $x = \frac{y-1}{2} = \frac{z-3}{\lambda}$ and the plane x + 2y + 3z = 4 is $\cos^{-1}\left(\sqrt{\frac{5}{14}}\right)$, then λ equals
(1) 2/3 (2) 3/2
(3) 2/5 (4) 5/3

Key: (1)

Sol.: $\frac{x-0}{1} = \frac{y-1}{2} = \frac{z-3}{\lambda}$
x + 2y + 3z = 4
Angle between the line and plane will be

$\theta = \sin^{-1}\left(\frac{1.1 + 2.2 + \lambda.3}{\sqrt{1+4+\lambda^2}\sqrt{1+4+9}}\right) = \sin^{-1}\frac{5+3\lambda}{\sqrt{14}\sqrt{5+\lambda^2}}$

$= \cos^{-1}\left(\sqrt{1 - \frac{(5+3\lambda)^2}{14(5+\lambda^2)}}\right) = \cos^{-1}\left(\sqrt{\frac{5}{14}}\right)$

(given)
$\Rightarrow \lambda = 2/3$.

71. The domain of the function $f(x) = \frac{1}{\sqrt{|x| - x}}$ is
(1) $(-\infty, \infty)$ (2) $(0, \infty)$
(3) $(-\infty, 0)$ (4) $(-\infty, \infty) - \{0\}$

Key: (3)

Sol.: $f(x) = \dfrac{1}{\sqrt{|x| - x}}$

$f(x)$ is define if $|x| - x > 0$

$\Rightarrow |x| > x$

$\Rightarrow x < 0$

So domain of $f(x)$ is $(-\infty, 0)$.

72. The shortest distance between line $y - x = 1$ and curve $x = y^2$ is

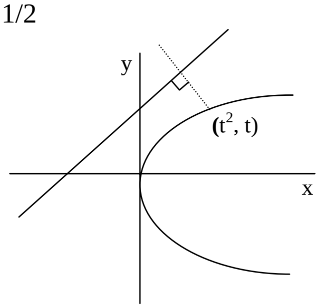
(1) $\dfrac{\sqrt{3}}{4}$ (2) $\dfrac{3\sqrt{2}}{8}$

(3) $\dfrac{8}{3\sqrt{2}}$ (4) $\dfrac{4}{\sqrt{3}}$

Key: (2)

Sol.: Shortest distance between two curve occurred along the common normal, so $-2t = -1$

$\Rightarrow t = 1/2$



So shortest distance between them is $\dfrac{3\sqrt{2}}{8}$

73. A man saves Rs. 200 in each of the first three months of his service. In each of the subsequent months his saving increases by Rs. 40 more than the saving of immediately previous month. His total saving from the start of service will be Rs. 11040 after.

(1) 18 months (2) 19 months

(3) 20 months (4) 21 months

Key: (4)

Sol.: Let it happened after m months

$2 \times 300 + \dfrac{m-3}{2}\,(2 \times 240 + (m - 4) \times 40))$

$= 11040$

$\Rightarrow m^2 + 5m - 546 = 0$

$\Rightarrow (m + 26)(m - 21) = 0 \Rightarrow m = 21.$

74. Consider the following statements

P: Suman is brilliant

Q : Suman is rich

R: Suman is honest

The negation of the statement Suman is brilliant and dishonest if and only if Suman is rich can be expressed as

(1) $\sim P \wedge (Q \leftrightarrow \sim R)$ (2) $\sim (Q \leftrightarrow (P \wedge \sim R))$

(3) $\sim Q \leftrightarrow \sim P \wedge R$ (4) $\sim (P \wedge \sim R) \leftrightarrow Q$

Key: (2)

Sol.: Suman is brilliant and dishonest if and only if Suman is rich is expressed as

$Q \leftrightarrow (P \wedge \sim R)$

Negation of it will be $\sim(Q \leftrightarrow (P \wedge \sim R))$

75. If $\omega\ (\neq 1)$ is a cube root of unity, and $(1 + \omega)^7 = A + B\omega$. Then (A, B) equals:

(1) (0, 1) (2) (1, 1)

(3) (1, 0) (4) (-1, 1)

Key: (2)

Sol.: $(1 + \omega)^7 = A + B\omega$

$(-\omega^2)^7 = A + B\omega$

$-\omega^2 = A + B\omega$

$1 + \omega = A + B\omega$

$\Rightarrow A = 1, B = 1.$

76. If $\vec{a} = \dfrac{1}{\sqrt{10}}\left(3\hat{i} + \hat{k}\right)$ and

$\vec{b} = \dfrac{1}{7}\left(2\hat{i} + 3\hat{j}\ \ 6\hat{k}\right)$, then the value of

$\left(2\vec{a} - \vec{b}\right).\left[\left(\vec{a} \times \vec{b}\right)\ \ \left(\vec{a}\ \ 2\vec{b}\right)\right]$ is $\times$ $+$

(1) - 5 (2) -3

(3) 5 (4) 3

Key: (1)

Sol.: $\left(2\bar{a} - \bar{b}\right).\left(\left(\bar{a} \times \bar{b}\right)\ \ \left(\bar{a}\ \ 2\bar{b}\right)\right)$ $\times$ $+$

$= \left(2\bar{a} - \bar{b}\right).\left(\left(\bar{a} \times \bar{b}\right) \times \bar{a}\ \ 2\left(\bar{a} + \bar{b}\right)\ \ \bar{b}\right) \times$ $\times$

$= \left(2\bar{a} - \bar{b}\right)\left((\bar{a}.\bar{a})\bar{b} - (\bar{a}.\bar{b})\bar{a}\ \ 2(\bar{a}.\bar{b})\bar{b}\ \ 2(\bar{b}.\bar{b})\bar{a}\right)$ $+$ $-$

$= \left(2\bar{a} - \bar{b}\right)\left(\bar{b} - 0\ \ 0\ \ 2\bar{a}\right)$ $+$ $-$

$= -4\bar{a}.\bar{a} - \bar{b}.\bar{b} = -5$.

77. If $\dfrac{dy}{dx} = y + 3 > 0$ and $y(0) = 2$, then $y(\ln 2)$ is equal to

(1) 7 (2) 5

(3) 13 (4) -2

Key: (1)

Sol.: $\dfrac{dy}{dx} = y + 3$

$\dfrac{dy}{y+3} = dx$

On integrating

$\ln|y + 3| = x + c$

$\Rightarrow \ln(y + 3) = x + c$

Since $y(0) = 2$

$\Rightarrow c = \ln 5$

$\ln(y + 3) = x + \ln 5$

put $x = \ln 2$

$y = 7$.

78. Equation of the ellipse whose axes are the axes of coordinates and which passes through the point (-3, 1) and has eccentricity $\sqrt{2/5}$ is

(1) $3x^2 + 5y^2 - 32 = 0$

(2) $5x^2 + 3y^2 - 48 = 0$
(3) $3x^2 + 5y^2 - 15 = 0$
(4) $5x^2 + 3y^2 - 32 = 0$

Key: (1)

Sol.: Let the ellipse be $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

It passes through (-3, 1) so $\frac{9}{a^2}+\frac{1}{b^2}=1$ ... (i)

Also, $b^2 = a^2 (1 - 2/5)$

$\Rightarrow 5b^2 = 3a^2$ ... (ii)

Solving we get $a^2 = \frac{32}{3}$, $b^2 = \frac{32}{5}$

So, the ellipse is $3x^2 + 5y^2 = 32$.

79. If the mean deviation about the median of the numbers a, 2a, ... , 50a is 50, then |a| equals

(1) 2 (2) 3
(3) 4 (4) 5

Key: (3)

Sol.: Median is the mean of 25th and 26th observation

$\therefore$ M = $\frac{25a+26a}{2}$ = 25.5 a

M.D (M) = $\frac{\Sigma|x_i - M|}{N}$

$\Rightarrow 50 = \frac{1}{50}$ [2×|a| × (0.5 + 1.5 + 2.5 + ... 24.5)]

$\Rightarrow 2500 = 2|a| \times \frac{25}{2}(25)$

$\Rightarrow |a| = 4$.

80. $\lim_{x\to 2}\left(\frac{\sqrt{1-\cos\{2(x-2)\}}}{x-2}\right)$

(1) does not exist (2) equals $\sqrt{2}$
(3) equals - $\sqrt{2}$ (4) equals $\frac{1}{\sqrt{2}}$

Key: (1)

Sol.: Let x - 2 = t

$\lim_{t\to 0}\frac{\sqrt{1-\cos 2t}}{t}$

$= \lim_{t\to 0}\sqrt{2}\frac{|\sin t|}{t}$

Clearly R.H.L. = $\sqrt{2}$

L.H.L. = - $\sqrt{2}$

Since R.H.L. ≠ L.H.L. So, limit does not exist.

81. Statement-1:
The number of ways of distributing 10 identical balls in 4 distinct boxes such that no box is empty is ${}^9C_3$
Statement-2:
The number of ways of choosing any 3 places from 9 different places is ${}^9C_3$.

(1) Statement-1 is true, Statement-2 is true; Statement-2 is a correct explanation for Statement-1.
(2) Statement-1 is true, Statement-2 is true; Statement-2 is not a correct explanation for Statement-1.
(3) Statement-1 is true, Statement-2 is false
(4) Statement-1 is false, Statement-2 is true.

Key: (1)

Sol.: The number of ways of distributing n identical objects among r persons such that each person gets at least one object is same as the number of ways of selecting (r - 1) places out of (n-1) different places, that is ${}^{n-1}C_{r-1}$.

82. Let R be the set of real numbers.
Statement-1:
A = {(x, y) ∈ R × R : y - x is an integer} is an equivalence relation on R.
B = {(x, y) ∈ R × R : x = αy for some rational number α} is an equivalence relation on R.

(1) Statement-1 is true, Statement-2 is true; Statement-2 is a correct explanation for statement-1.
(2) Statement-1 is true, Statement-2 is true; Statement-2 is not a correct explanation for Statement-1.
(3) Statement-1 is true, Statement-2 is false
(4) Statement-1 is false, Statement-2 is true.

Key: (3)

Sol.: Clearly, A is an equivalence relation but B is not symmetric. So, it is not equivalence.

83. Consider 5 independent Bernoulli's trails each with probability of success p. If the probability of at least one failure is greater than or equal to $\frac{31}{32}$, then p lies in the interval.

(1) $\left(\frac{1}{2},\frac{3}{4}\right]$ (2) $\left(\frac{3}{4},\frac{11}{12}\right]$
(3) $\left[0,\frac{1}{2}\right]$ (4) $\left(\frac{11}{12},1\right]$

Key: (3)

Sol.: P(at least one failure)
= 1 - P (No failure)
= $1 - p^5$

Now $1 - p^5 \geq \frac{31}{32}$

$\Rightarrow p^5 \leq \left(\frac{1}{2}\right)^5$

$\Rightarrow p \leq \frac{1}{2}$

But $p \geq 0$

So, P lies in the interval $[0, \frac{1}{2}]$.

84. The two circles $x^2 + y^2 = ax$ and $x^2 + y^2 = c^2$ $(c > 0)$ touch each other if

(1) $2|a| = c$ (2) $|a| = c$
(3) $a = 2c$ (4) $|a| = 2c$

Key: (2)

Sol.: If the two circles touch each other, then they must touch each other internally.

So, $\frac{|a|}{2} = c - \frac{|a|}{2}$

$\Rightarrow |a| = c$.

85. Let A and B be two symmetric matrices of order 3.

Statement-1:
A(BA) and (AB)A are symmetric matrices.

Statement-2:
AB is symmetric matrix if matrix multiplication of A and B is commutative.

(1) Statement-1 is true, Statement-2 is true; Statement-2 is correct explanation for Statement-1.
(2) Statement-1 is true, Statement-2 is true; Statement-2 is not a correct explanation for Statement-1.
(3) Statement-1 is true, Statement-2 is false.
(4) Statement-1 is false, Statement-2 is true.

Key: (2)

Sol.: Given, $A' = A$
$B' = B$
Now $(A(BA))' = (BA)'A' = (A'B')A' = (AB)A = A(BA)$
Similarly $((AB)A)' = (AB)A$
So, A(BA) and (AB)A are symmetric matrices.
Again $(AB)' = B'A' = BA$
Now if BA = AB, then AB is symmetric matrix.

86. If C and D are two events such that $C \subset D$ and $P(D) \neq 0$, then the correct statement among the following is

(1) $P(C|D) = P(C)$ (2) $P(C|D) \geq P(C)$
(3) $P(C|D) < P(C)$ (4) $P(C|D) = \frac{P(D)}{P(C)}$

Key: (2)

Sol.: $P\left(\frac{C}{D}\right) = \frac{P(C \cap D)}{P(D)} = \frac{P(C)}{P(D)} \geq P(C)$

(Since $0 < P(D) \leq 1$

So, $\frac{P(C)}{P(D)} \geq P(C)$)

87. The vectors $\vec{a}$ and $\vec{b}$ are not perpendicular and $\vec{c}$ and $\vec{d}$ are two vectors satisfying: $\vec{b} \times \vec{c} = \vec{b} \times \vec{d}$ and $\vec{a}.\vec{d} = 0$. Then the vector $\vec{d}$ is equal to

(1) $\vec{b} - \left(\frac{\vec{b}.\vec{c}}{\vec{a}.\vec{b}}\right)\vec{c}$ (2) $\vec{c} + \left(\frac{\vec{a}.\vec{c}}{\vec{a}.\vec{b}}\right)\vec{b}$
(3) $\vec{b} + \left(\frac{\vec{b}.\vec{c}}{\vec{a}.\vec{b}}\right)\vec{c}$ (4) $\vec{c} - \left(\frac{\vec{a}.\vec{c}}{\vec{a}.\vec{b}}\right)\vec{b}$

Key: (4)

Sol.: $\vec{a}.\vec{b} \neq 0$
$\vec{a}.\vec{d} = 0$
$\vec{b} \times \vec{c} = \vec{b} \times \vec{d}$
$\Rightarrow \vec{b} \times (\vec{c} - \vec{d}) = 0$
$\vec{b}$ is parallel to $\vec{c} - \vec{d}$
$\vec{c} - \vec{d} = \lambda \vec{b}$
Taking dot product with $\vec{a}$
$\vec{a}.\vec{c} - 0 = \lambda \vec{a}.\vec{b}$
$\Rightarrow \lambda = \frac{\vec{a}.\vec{c}}{\vec{a}.\vec{b}}$
So, $\vec{d} = \vec{c} - \left(\frac{\vec{a}.\vec{c}}{\vec{a}.\vec{b}}\right)\vec{b}$

88. Statement-1:
The point A(1, 0, 7) is the mirror image of the point B(1, 6, 3) in the line $\frac{x}{1} = \frac{y-1}{2} = \frac{z-2}{3}$

Statement-2:
The line : $\frac{x}{1} = \frac{y-1}{2} = \frac{z-2}{3}$ bisects the line segment joining A(1, 0, 7) and B(1, 6, 3).

(1) Statement-1 is true, Statement-2 is true; Statement-2 is a correct explanation for statement-1.
(2) Statement-1 is true, Statement-2 is true; Statement-2 is not a correct explanation for Statement-1.
(3) Statement-1 is true, Statement-2 is false.
(4) Statement-1 is false, Statement-2 is true.

Key: (2)

Sol.: The direction ratio of the line segment joining points A(1, 0, 7) and B(1, 6, 3) is 0, 6, -4.
The direction ratio of the given line is 1, 2, 3.
Clearly $1 \times 0 + 2 \times 6 + 3 \times (-4) = 0$
So, the given line is perpendicular to line AB.
Also , the mid point of A and B is (1, 3, 5) which lies on the given line.
So, the image of B in the given line is A, because the given line is the perpendicular bisector of line segment joining points A and B.

89. If $A = \sin^2 x + \cos^4 x$, then for all real x:

(1) $\frac{3}{4} \le A \le 1$ (2) $\frac{13}{16} \le A \le 1$

(3) $1 \le A \le 2$ (4) $\frac{3}{4} \le A \le \frac{13}{16}$

Key: (1)

Sol.: $A = \sin^2 x + \cos^4 x$

$= \sin^2 x + \cos^2 x. (1 - \sin^2 x)$

$= 1 - \frac{1}{4}\sin^2 2x$

Since; $0 \le \sin^2 2x \le 1$

So, $\frac{3}{4} \le A \le 1.$

90. The number of values of k for which the linear equations

$4x + ky + 2z = 0$
$kx + 4y + z = 0$
$2x + 2y + z = 0$

posses a non-zero solution is:

(1) 3 (2) 2

(3) 1 (4) zero

Key: (2)

Sol.: For the system to have non-zero solution

$$\begin{vmatrix} 4 & k & 2 \\ k & 4 & 1 \\ 2 & 2 & 1 \end{vmatrix} = 0$$

$\Rightarrow k^2 - 6k + 8 = 0$

$\Rightarrow k = 2$ or 4.

Read the following instructions carefully:

1. The candidates should fill in the required particulars on the Test Booklet and Answer Sheet**(Side–1)** with **Blue / Black Ball Point Pen**.
2. For writing / marking particulars on **Side–2** of the Answer Sheet, use **Blue / Black Ball Point Pen only**.
3. The candidates should not write their Roll Numbers anywhere else (except in the specified space) on the Test Booklet / Answer Sheet.
4. Out of the four options given for each question, only one option is the correct answer.
5. For each **incorrect response, one-fourth (1/4)** of the total marks allotted to the question would be deducted from the total score. **No deduction** from the total score, however, will be made **if no response** is indicated for an item in the Answer Sheet.
6. Handle the Test Booklet and Answer Sheet with care, as under no circumstance *(except for discrepancy in Test Booklet Code and Answer Sheet Code), will another set be provided.*
7. The candidates are not allowed to do any rough work or writing work on the Answer Sheet. All calculations / writing work are to be done in the space provided for this purpose in the Test Booklet itself, marked ‘Apace for Rough Work’. This space is given at the bottom of each page and in 3 pages (Page 21 – 23) at the end of the booklet.
8. On completion of the test, the candidates must hand over the Answer Sheet to the Invigilator on duty in the Room / Hall. **However, the candidates are allowed to take away this Test Booklet with them**.
9. Each candidate must show on demand his/her Admit Card to the Invigilator.
10. No candidate, without special permission of the Superintendent or Invigilator, should leave his/her seat.
11. The candidates should be leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and sign the Attendance Sheet again. Cases where a candidate has not signed the Attendance Sheet a second time will be deemed not to have handed over the Answer Sheet and dealt with as an unfair means case. **The candidates are also required to put their left hand THUMB impression in the space provided in the Attendance Sheet**.
12. Use of Electronic / Manual Calculator and any Electronic Item like mobile phone, pager etc. is prohibited.
13. The candidates are governed by all Rules and Regulations of the Board with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of the Board.
14. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.
15. **Candidates are not allowed to carry any textual material, printed or written, bits of papers, pager, mobile phone, electronic device or any other material except the Admit Card inside the examination hall / room.**

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