MODEL PAPER - 5

MATHEMATICS

1. If z satisfies the equation $|z| - z = 1 + 2i$, then z is equal to *(Complex Numbers)*
1) $\frac{3}{2} + 2i$ 2) $\frac{3}{2} - 2i$ 3) $2 - \frac{3i}{2}$ 4) $2 + \frac{3i}{2}$

2. If f is a function such that f(0) = 2, f (1) = 3, f(x + 2) = 2f(x) - f(x + 1) for $x \geq 0$ then f(4) is equal to *(Functions)*
1) - 3 2) 13 3) - 7 4) 17

3. The chances of defective screws in three boxes A, B, C are $\frac{1}{5}, \frac{1}{6}, \frac{1}{7}$ respectively. A box is selected at random and a screw is drawn from it at random and is found to be defective. Then the probability that it came from box A is *(Probability)*
1) $\frac{16}{29}$ 2) $\frac{1}{15}$ 3) $\frac{27}{59}$ 4) $\frac{42}{107}$

4. The equation $\lambda x^2 + 4xy + y^2 + \lambda x + 3y + 2 = 0$ represents a parabola, then λ is *(Parabola)*
1) 3 2) 1 3) 2 4) 4

5. If $x = \sec\theta - \cos\theta$, $y = \sec^n\theta - \cos^n\theta$, then $(x^2 + 4)\left(\frac{dy}{dx}\right)^2 =$ *(Differentiation)*
1) $n^2 (y^2 - 4)$ 2) $n^2 (4 - y^2)$ 3) $n^2 (y^2 + 4)$ 4) $n^2 (y^2 + 1)$

6. $\lim_{x \to 0} \left\{\frac{1 + \tan x}{1 + \sin x}\right\}^{\operatorname{cosec} x} =$ *(Limits)*
1) $\frac{1}{e}$ 2) 1 3) 3 4) e^2

7. If A(3, 5), B(-5, -4), C(7, 10) are the vertices of a parallelogram, taken in order, then the coordinates of the fourth vertex are *(2D)*
1) (10, 19) 2) (15, 19) 3) (19, 10) 4) (19, 15)

8. If P = (1, 0), Q = (-1, 0) and R = (2, 0) are three given points, then the locus of a point S satisfying the relation $SQ^2 + SR^2 = 2SP^2$ is *(Locus)*
1) a straight line parallel to x-axis 2) a circle through origin
3) a circle with centre at the origin 4) a straight line parallel to y-axis

9. The angle of rotation of axes to remove xy term in $2xy + a^2 = 0$ is *(Transformation)*
1) $\frac{\pi}{6}$ 2) $\frac{\pi}{4}$ 3) $\frac{\pi}{3}$ 4) $\frac{\pi}{2}$

10. The quadrilateral formed by the lines x - y + 2 = 0, x + y = 0, x - y - 4 = 0, x + y - 12 = 0 is *(Straight Lines)*
1) parallelogram 2) rectangle 3) rhombus 4) square

11. The image of (2, 3) with respect to y-axis is collinear with (-1, -1) and (-4, λ) then λ = *(Straight Lines)*
1) - 11 2) - 12 3) 11 4) 12

12. The equations of the sides AB, BC and CA of the triangle ABC are y - x = 2, x + 2y = 1 and 3x + y + 5 = 0 respectively. The equation of the altitude through B is *(Straight Lines)*
1) x - 3y + 1 = 0 2) x - 3y + 4 = 0 3) 3x - y + 2 = 0 4) x + 3y - 4 = 0

13. The equation of the pair of straight lines perpendicular to the pair $2x^2 + 5xy + 2y^2 + 10x + 5y = 0$ and passing through the origin is *(Pair of Straight Lines)*
1) $2x^2 + 5xy + 2y^2 = 0$ 2) $2x^2 - 3xy + y^2 = 0$ 3) $2x^2 + 3xy + y^2 = 0$ 4) $2x^2 - 5xy + 2y^2 = 0$

14. If p_1, p_2, p_3 are the product of perpendiculars from (0, 0) to xy + x + y + 1 = 0, $x^2 - y^2 + 2x + 1 = 0$, $2x^2 + 3xy + 2y^2 + 3x + y + 1 = 0$ respectively then ascending order of p_1, p_2, p_3 is *(Pair of Straight Lines)*
1) p_1, p_2, p_3 2) p_3, p_2, p_1 3) p_2, p_3, p_1 4) p_1, p_3, p_2

15. The hormonic conjugate of (2, 3, 4) w.r. to the points (3, -2, 2), (6, -17, -4) is *(3D)*
1) $\left(\frac{18}{5}, -5, \frac{4}{5}\right)$ 2) (11, -16, 2) 3) $\left(\frac{1}{2}, \frac{1}{3}, \frac{1}{4}\right)$ 4) (0, 0, 0)

16. If a line makes angles $\alpha, \beta, \gamma, \delta$ with four diagonals of a cube, then $\cos^2\alpha + \cos^2\beta + \cos^2\gamma + \cos^2\delta$ will be *(Direction Cosine)*
1) 4/3 2) 3/4 3) 1/4 4) 1/2

17. If (2, 3, -1) is the foot of the perpendicular from (4, 2, 1) to a plane, the equation of the plane is *(Plane)*
1) 2x - y - 2z - 3 = 0 2) 2x + y - 2z - 9 = 0 3) 2x + y + 2z - 5 = 0 4) 2x - y + 2z + 1 = 0

18. $\lim_{x \to 0}\left(\frac{\sin^{-1} x - x}{x^3 \cos x}\right) =$ *(Limits)*
1) 1/2 2) 1/3 3) 1/6 4) 1/12

19. $\lim_{x \to 0} \frac{\int_0^{x^2} \cos t^2 dt}{x \sin x} =$ *(Limits)*
1) -1 2) 1 3) 2 4) -2

20. If f(x) = $(x + 1)^{\cot x}$ be continuous at x = 0, then f(0) is equal to ***(Continuity)***
1) 0 2) - e 3) e 4) e^{-1}

21. $\frac{d}{dx}\left[\left(\frac{\tan^2 2x - \tan^2 x}{1-\tan^2 2x.\tan^2 x}\right)\cot 3x\right] =$ ***(Differentiation)***
1) tan2x.tanx 2) tan3x.tanx 3) $\sec^2 x$ 4) secx.tanx

22. If $x = \frac{1-\sqrt{y}}{1+\sqrt{y}} \Rightarrow \frac{dy}{dx}$ is equal to ***(Differentiation)***
1) $\frac{4}{(x+1)^2}$ 2) $\frac{4(x-1)}{(x+1)^3}$ 3) $\frac{x-1}{(x+1)^3}$ 4) $\frac{4}{(x+1)^3}$

23. There is an error of $\pm$ 0.04 cm in the measurement of the diameter of a sphere. When the radius is 10 cm, the percentage error in the volume of the sphere is
(Error)
1) $\pm$ 1.2 2) $\pm$ 10 3) $\pm$ 0.8 4) $\pm$ 0.6

24. The coordinates of the point on the curve $y = x^2 - 3x + 2$ where the tangent is perpendicular to the straight line y = x are ***(Tangents & Normals)***
1) (0, 2) 2) (1, 0) 3) (-1, 6) 4) (2, -2)

25. A point on the parabola $y^2 = 18x$ at which the ordinate increases at twice the rate of the abscissa is ***(Parabola)***
1) (2, 4) 2) (2, -4) 3) $\left(\frac{-9}{8}, \frac{9}{2}\right)$ 4) $\left(\frac{9}{8}, \frac{9}{2}\right)$

26. In the mean value theorem f(b) - f(a) = (b - a) $f'(c)$, if a = 4, b = 9 and f(x) = $\sqrt{x}$, then the value of c is ***(Mean Value Theorem)***
1) 8.00 2) 5.25 3) 2.5 4) 6.25

27. If (x) = $\cot^{-1} x + x$ increases in the interval ***(Maxima & Minima)***
1) $(1, \infty)$ 2) $(-1, \infty)$ 3) $(-\infty, \infty)$ 4) $(0, \infty)$

28. The maximum value of the function $x^3 - 18x^2 + 96x + 4$ is ***(Maxima & Minima)***
1) 164 2) 8 3) 4 4) 708

29. Tangents are drawn from the point (17, 7) to the circle $x^2 + y^2 = 169$ ***(Circles)***
Assertion(A): The tangents are mutually perpendicular
Reason(R): The locus of the points from which mutually perpendicular tangents can be drawn to the given circle is $x^2 + y^2 = 338$
The true statements are:
1) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**
2) Both **(A)** and **(R)** are true and **(R)** is not the correct explanation of **(A)**
3) **(A)** is true and **(R)** is false 4) **(A)** is false and **(R)** is true

30. A point (α, β) lies on a circle $x^2 + y^2 = 1$, then locus of the point $(3\alpha + 2, \beta)$ is
(Circles)
1) a straight line 2) an ellipse 3) a parabola 4) a circle

31. The equation of circle passing through the intersection of the circles $x^2 + y^2 = 4$ and $x^2 + y^2 - 2x - 2y + 1 = 0$ whose centre is at a distance $2\sqrt{2}$ from the origin is
(Circles)
1) $x^2 + y^2 + 4x + 4y + 4 = 0$ 2) $x^2 + y^2 - 4x - 4y + 8 = 0$
3) $x^2 + y^2 + x + y + 4 = 0$ 4) $x^2 + y^2 + 4x + 4y - 14 = 0$

32. If the line x - ay + 6 = 0 touches the ellipse $x^2 + 2y^2 = 4$ then the value of a is ***(Ellipse)***
1) $\pm$ 1 2) $\pm$ 4 3) $\pm$ 2 4) 0

33. The coordinates of a point P on the ellipse $4x^2 + 9y^2 = 36$ such that the area of the ΔPSS' = $\sqrt{10}$, S and S' being foci is ***(Ellipse)***
1) $\left(\pm 2, \pm\frac{3}{\sqrt{2}}\right)$ 2) $(\pm\sqrt{2}, \pm 2)$ 3) $\left(\pm\frac{3}{\sqrt{2}}, \pm\sqrt{2}\right)$ 4) $(\pm 1, \sqrt{2})$

34. If any point on a hyperbola is $(3\tan\phi, 2\sec\phi)$ then the eccentricity of the hyperbola is
(Hyperbola)
1) $\frac{\sqrt{13}}{2}$ 2) $\frac{\sqrt{13}}{3}$ 3) $\sqrt{13}$ 4) $\frac{\sqrt{7}}{2}$

35. $\int \frac{dx}{\cos^3 x\sqrt{2\sin 2x}} =$ ***(Integration)***
1) $\sqrt{\tan x} + \frac{\tan^{5/2} x}{5} + C$ 2) $\sqrt{\tan x} + \frac{2}{5}\tan^{5/2} x + C$
3) $2\sqrt{\tan x} + \frac{2}{5}\tan^{5/2} x + C$ 4) $2\sqrt{\tan x} - \frac{2}{5}\tan^{5/2} x + C$

36. $\int\left(\frac{x+2}{x+4}\right)^2 e^x\,dx =$ ***(Integration)***

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

37. $\int_0^1 x\left|x-\frac{1}{2}\right| dx =$ ***(Definite Integration)***

1) 1/3 2) 1/4 3) 1/8 4) 1/2

38. $\int_8^{15}\frac{dx}{(x+3)\sqrt{x+1}} =$ ***(Definite Integration)***

1) $\sqrt{2}Cot^{-1}\left(7\sqrt{2}\right)$ 2) $\log\left(\frac{4}{5}\right)$ 3) $\sqrt{2}Tan^{-1}\left(7\sqrt{2}\right)$ 4) $\sqrt{2}Tan^{-1}\left(\sqrt{2}\right)$

39. $\lim_{n\to\infty}\left[\frac{n}{1^2+n^2}+\frac{n}{2^2+n^2}+\frac{n}{3^2+n^2}+....+\frac{n}{n^2+n^2}\right]=$ ***(Definite Integration)***

1) log2 2) 0 3) 1 4) $\frac{\pi}{4}$

40. If the area bounded by the parabola $y = 2 - x^2$ and the line x + y = 0 is A sq. units, then A equals ***(Areas)***

1) 1/2 2) 1/3 3) 2/9 4) 9/2

41. The solution of the differential equation $\frac{dy}{dx}$ = y tan x - 2 sin x is ***(Differentiation Equations)***

1) ysin x = sin 2x + c 2) ycos x = $\frac{1}{2}$sin 2x + c 3) ycos x = - sin 2x + c 4) ycos x = $\frac{1}{2}$cos 2x + c

42. The general solution of the differential eqation $\frac{dy}{dx}+\sin\left(\frac{x+y}{2}\right)=\sin\left(\frac{x-y}{2}\right)$ is ***(Differentiation Equations)***

1) log tan $\left(\frac{y}{2}\right)$ = c - 2sin x 2) log tan $\left(\frac{y}{4}\right)$ = c - 2sin$\left(\frac{x}{2}\right)$

3) log tan $\left(\frac{y}{2}+\frac{\pi}{4}\right)$ = c - 2sin x 4) log tan $\left(\frac{y}{4}+\frac{\pi}{4}\right)$ = c - 2sin$\left(\frac{x}{2}\right)$

43. A function $f : R^+ \to R$ defined by $f(x) = x^2$ is ***(Functions)***

1) onto but not one - one 2) one - one and onto both

3) neither one - one nor onto 4) one - one but not onto

44. If f(x) = sin $\left[\log\left(\frac{\sqrt{4-x^2}}{1-x}\right)\right]$ then the domain of f is ***(Functions)***

1) (-2, ∞) 2) (-2, 1) 3) [-2, 1] 4) (-2, -1)

45. $\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)$.........$\left(1-\frac{1}{n}\right)$ = (where $n \geq 2$) ***(Mathmatical Induction)***

1) $\frac{1}{n^2}$ 2) $\frac{1}{n^3}$ 3) $\frac{2}{n}$ 4) $\frac{1}{n}$

46. If the vectors form the sides of a triangle, then they are ***(Vectors)***

1) linearly independent 2) linearly dependent

3) collinear 4) the sides of an equilateral triangle

47. If the vectors $2\hat{i}-3\hat{j}+4\hat{k}, \hat{i}+2\hat{j}-\hat{k}$ and $\lambda\hat{i}-\hat{j}+2\hat{k}$ are coplanar, then λ = ***(Vectors)***

1) 0 2) $\frac{5}{8}$ 3) $\frac{8}{5}$ 4) 1

48. If $\vec{a}=\hat{j}-\hat{k}, \vec{c}=\hat{i}+\hat{j}+\hat{k}$ are given vectors, then a vector $\vec{b}$ satisfies $\left(\vec{a}x\vec{b}\right)+\vec{c}=\vec{0}$ and $\vec{a}.\vec{b}$ = 3is ***(Vectors)***

1) $\hat{i}+\hat{j}+2\hat{k}$ 2) $\hat{i}+\hat{j}-2\hat{k}$ 3) $-\hat{i}+\hat{j}-2\hat{k}$ 4) $\hat{i}-\hat{j}+2\hat{k}$

49. If $\bar{a}+2\bar{b}+4\bar{c}=\bar{0}$ and $\left(\bar{a}\,x\,\bar{b}\right)+\left(\bar{b}\,x\,\bar{c}\right)+\left(\bar{c}\,x\,\bar{a}\right)=\lambda\left(\bar{b}\,x\,\bar{c}\right)$, then λ =

Vectors)

1) 4 2) 7 3) 8 4) 9

50. If the position vectors of A, B and C are respectively $2\bar{i}-\bar{j}+\bar{k}$, $\bar{i}-3\bar{j}-5\bar{k}$ and $3\bar{i}-4\bar{j}-4\bar{k}$, then $\cos^2 A$ =

1) 0 2) $\frac{6}{41}$ 3) $\frac{35}{41}$ 4) $\frac{25}{41}$ ***(Vectors)***

51. Arrange the following descending order of their values ***(Vectors)***

A) $\left[\bar{i}\,x\,\bar{j}\ \ \bar{j}\,x\bar{k}\ \ \bar{k}\,x\,\bar{i}\right]$ B) $\left[\bar{i}+\bar{j}\ \ \bar{j}+\bar{k}\ \ \bar{k}+\bar{i}\right]$ C) $\left(\bar{i}\,x\,\bar{j}\right).\left(\bar{j}\,x\,\bar{k}\right)$ D) $\left(\bar{k}\,x\,\bar{j}\right).\left(\bar{j}\,x\,\bar{k}\right)$

1) B, A, C, D 2) B, A, D, C 3) D, C, B, A 4) B, C, A, D

52. If A = $\begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$, I is the unit matrix of order 2 and a, b are arbitrary constants, then $(aI + bA)^2$ = *(Matrices)*
1) $a^2I + abA$ 2) $a^2I + 2abA$ 3) $a^2I + b^2A$ 4) $a^2I + bA$

53. A = $\frac{1}{3}\begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ -2 & 2 & -1 \end{bmatrix}$ then A^{-1} = *(Matrices)*
1) A^T 2) $2A^T$ 3) $3A^T$ 4) $4A^T$

54. If A = $\begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$ and $A + A^T = I$, then the value of α is *(Matrices)*
1) $\frac{3\pi}{2}$ 2) π 3) $\frac{\pi}{3}$ 4) $\frac{\pi}{6}$

55. The value of k so that the system of linear equations x - y + 2z = 0, kx - y + z = 0, 3x + y - 3z = 0 does not possess a unique solution is *(Matrices)*
1) 4 2) 5 3) 0 4) 3

56. If $\sin\theta + \cos\theta = h$ then the quadratic equation having $\sin\theta$ and $\cos\theta$ as its roots is *(Quadratic Expressions)*
1) $x^2 - hx + (h^2 - 1) = 0$ 2) $2x^2 - 2hx + (h^2 - 1) = 0$ 3) $x^2 - hx + 2(h^2 - 1) = 0$ 4) $x^2 - 2hx + (h^2 - 1) = 0$

57. $\sum_{r=1}^{9} \sin^2\left(\frac{r\pi}{18}\right) =$ *(Trignomentry)*
1) 4 2) 5 3) 3 4) 6

58. If $\alpha + \beta - \gamma = \pi$ then $\sin^2\alpha + \sin^2\beta - \sin^2\gamma$ = *(Trignomentry)*
1) $2\sin\alpha \sin\beta \sin\gamma$ 2) $2\cos\alpha \sin\beta \cos\gamma$ 3) $2\sin\alpha \sin\beta \cos\gamma$ 4) $2\sin\alpha \cos\beta \cos\gamma$

59. The period of $\sin(\pi x/2) + \cos(\pi x/3)$ is *(Trignomentry)*
1) 4 2) 6 3) 12 4) 24

60. Number of solutions of the equation $8\tan^2\theta + 9 = 6\sec\theta$ in $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ is *(Trignomentry Equations)*
1) 2 2) 4 3) 0 4) 1

61. $\cos^{-1}\frac{63}{65} + 2\tan^{-1}\frac{1}{5} = \sin^{-1} x \Rightarrow x =$ *(Inverse Trignomentry)*
1) $\frac{3}{5}$ 2) $\frac{2}{5}$ 3) $\frac{4}{5}$ 4) $\frac{1}{5}$

62. If $\sinh^{-1}(2) + \sinh^{-1}(3) = \alpha$, then $\sinh\alpha$ = *(Hyperbola)*
1) $2\sqrt{5} + 3\sqrt{10}$ 2) $2\sqrt{10} + 3\sqrt{5}$ 3) $2\sqrt{10} + 2\sqrt{5}$ 4) $3\sqrt{10} + 3\sqrt{5}$

63. If in triangle ABC, $\left(1 - \frac{3r_1}{r_2}\right)\left(1 - \frac{3r_1}{r_3}\right) = 4$ where r_1, r_2, r_3 are ex-radii, then *(Properties of Triangles)*
1) A = $\frac{\pi}{2}$ 2) B = $\frac{\pi}{2}$ 3) C = $\frac{\pi}{2}$ 4) A = $\frac{\pi}{3}$

64. Given an isosceles triangle, whose one angle is 120^0 and radius of it's incircle is $\sqrt{3}$, then the area of the triangle in sq. units is *(Properties of Triangles)*
1) $7 + 12\sqrt{3}$ 2) $12 + 7\sqrt{3}$ 3) $12 - 7\sqrt{3}$ 4) $4 + 2\sqrt{3}$

65. If the area of the triangle on the complex plane formed by the points z, z + iz and iz is 50 then |z| is *(Complex Numbers)*
1) 10 2) 15 3) 1 4) 5

66. If 1, α, α^2, ..., α^{n-1} be the n^{th} roots of unity and p, k $\in$ N and p = kn, then $1^p + \alpha^p + (\alpha^2)^p + (\alpha^3)^p + ... + (\alpha^{n-1})^p$ = *(De-Moiver's Theorem)*
1) 0 2) n 3) p 4) kn

67. The values of k for which the equations $x^2 - kx - 21 = 0$ and $x^2 - 3kx + 35 = 0$ will have a common root, are *(Quadratic Expressions)*
1) k = $\pm$ 4 2) k = $\pm$ 1 3) k = $\pm$ 3 4) k = $\pm$ 2

68. If the difference between the roots of the equation $x^2 + kx + 1 = 0$ is less than $\sqrt{5}$, then k$\in$ *(Quadratic Expressions)*
1) $(3, \infty)$ 2) $(-\infty, -3)$ 3) $(-3, -2) \cup (2, 3)$ 4) $(0, \infty)$

69. If α, β, γ are the roots of the equation $x^3 + 4x + 1 = 0$, then $(\alpha + \beta)^{-1} + (\beta + \gamma)^{-1} + (\gamma + \alpha)^{-1}$ is equal to *(Theory of Equations)*
1) 2 2) 3 3) 4 4) 5

70. The equation of lowest degree with rational coefficients one of whose roots is $\sqrt{3} - \sqrt{2}$, is *(Theory of Equations)*
1) $x^4 + 10x^2 - 1 = 0$ 2) $x^4 + x^2 - 10 = 0$ 3) $x^4 - 10x^2 - 1 = 0$ 4) $x^4 - 10x^2 + 1 = 0$

71. Number of four digited numbers made by the digits 1, 2, 3, 4, 5 which are not multiples of 3 is *(Permutation & Combination)*
1) 120 2) 96 3) 24 4) 48

72. Total number of books is 2n + 1. One is allowed to select a minimum of the one book and a maximum of n books. If total number of selections is 63, then value of n is *(Permutation & Combination)*
1) 3 2) 6 3) 2 4) 7

73. If the letters of the word 'BRING' are permuted in all possible ways and the words thus formed are arranged in the dictionary order, the 59^{th} word is *(Permutation & Combination)*
1) IGRBN 2) IGRNB 3) IGBNR 4) IGBRN

74. If $(1 + x + x^2)^n = a_0 + a_1x + a_2x^2 + ... + a_{2n}x^{2n}$ then match the list - I to list - II *(Binomial Theorem)*

List - I	**List - II**
I) $a + a + a + ... + a_{2n}$	a) $\frac{1+3^n}{2}$
II) $a_0 - a_1 + a_2 - .... + a_{2n}$	b) $\frac{3^n-1}{2}$
III) $a_0 + a_2 + a_4 + ... + a_{2n}$	c) 1
IV) $a_1 + a_3 + a_5 + ... + a_{2n-1}$	d) 0
	e) 3^n

Then the correct match is
1) I - e, II - c, III - b, IV - a
2) I - e, II - b, III - a, IV - c
3) I - e, II - c, III - a, IV - b
4) I - e, II - c, III - d, IV - b

75. If $S_n = 1 + 2 + 3 + 4 + ... +n$, then $S_1 - S_2x + S_3x^2 - S_4x^3 + ... + (-1)^rS_{r+1}x^r + ... \infty =$ *(Binomial Theorem)*
1) $(1 - x)^{-3}$ 2) $(1 + x)^{-3}$ 3) $(1 - x)^{-1/3}$ 4) $(1 + x)^{-1/3}$

76. Mean deviation from the mean of the data 6, 7, 10, 12, 13, 4, 12, 16 is *(Measure of Dispersion)*
1) 2.75 2) 3 3) 3.5 4) 3.25

77. Observe the following statements: *(Probability)*
I: In a non - leap year the probability of getting 53 Sundays or 53 Tuesdays or 53 Thursdays is 5/7.
II: Three six faced dice are rolled together, then the probability that exactly two of the three numbers are equal, is $\frac{90}{216}$.
Which of the above statement is true?
1) Only I 2) Only II 3) Both I and II 4) Neither I nor II

78. Probability that a student will succeed in IIT entrance test is 0.2 and that he will succeed in Roorkee entrance test is 0.5. If the probability that he will be successful at both the tests is 0.3, then the probability that he does not succeed at both the tests, is *(Probability)*
1) 0.4 2) 0.3 3) 0.2 4) 0.6

79. X be a discrete random variable with probability distribution is as follows *(Random & Variables)*

X = x	0	1	2	3
P(X = x) :	$\frac{1}{3}$	α	$\frac{1}{6}$	β

and mean of X is $\frac{3}{2}$ then the values of α and β are
1) $\frac{1}{3};\frac{1}{6}$ 2) $\frac{1}{2};\frac{1}{3}$ 3) $\frac{1}{3};\frac{1}{2}$ 4) $\frac{1}{6};\frac{1}{3}$

80. If the variance of poisson distribution is 2, then the value of $P(X \geq 1)$ is *(Random & Variables)*
1) $\frac{1}{e^{-2}}$ 2) $e^{-2/3}$ 3) $1 - e^{-2}$ 4) $e^{-2} - 1$