MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

MOCK QUESTION PAPER - 5

Part A

1. If $X = \{a, b, c, d\}, Y = \{f, b, d, g\}$ Find Y-X ?

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2. If A={-1,1}, find $A \times A \times A$.

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3. Convert 240° into radian measure.

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4. Simplify :$i^9 + i^{19}$?

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5. If ${}^nC_8 = {}^nC_2$ find the value of 'n'.

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6. If n^{th} term of the sequences is$a_n = (-1)^{n-1}5^{n+1}$, Find a_3 ?

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7. Find the value of x for which the points (x,-1) (2,1) and (4,5) are collinear

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8. Evaluate $\lim_{x \to 0} \frac{ax+b}{cx+1}$

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9. Write the negation of the statement .'The sum of 3 and 4 is 9' ?

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10. Given P(A) $= \frac{3}{5}$ and $P(B) = \frac{1}{5}$. Find P(A or B), if A & B are mutually exclusive events.

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Part B

1. In a committee, 50 people speak French 20 speak Spanish and 10 speak both Spanish and French. How many speak at

least on of the these two languages ?

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2. If A={3,5,7,9,11},B={7,9,11,13},C={11,13,15} and $D = \{15, 17\}$, find

$A \cap (B \cup C)$

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3. If $\left(\frac{x}{3} + 1, y - \frac{2}{3}\right) = \left(\frac{5}{3}, \frac{1}{3}\right)$, find the values of x and y.

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4. Prove that $\frac{\cos 7x + \cos 5x}{\sin 7x - \sin 5x} = \cot x$?

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5. $\cos 4x = 1 - 8\sin^2 x \cos^2 x$

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6. Solve $x^2 + 3x + 9 = 0$

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7. Solve $\frac{3(x-2)}{5} \leq \frac{5(2-x)}{3}$

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8. The vertices of $\triangle PQR$ are P(2,1),Q(-2,3) and R(4,5). Find the equation of the median through the vertex R.

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9. Find the angle between the lines $\sqrt{3}x + y = 1$ and $x + \sqrt{3}y = 1$

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10. Three vertices of a parallelogram ABCD are A(3,-1,2) ,B(1,2,-4) and C(-1,1,2) .find the co-ordinates of the fourth vertex ?

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11. Find the derivative of $f(x) = 1 + x + x^2 + x^3 + .. + x^{50}$ at x=1 ?

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12. Write the converse and contrapositive of the statement

" If x is a prime number then x is odd "

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13. Find the variance of the following data 6,7,10,12,13,4,8,12 ?

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14. A letter is chosen at random from the word 'ASSASSINATION' Find the probability that latter is a vowel (ii) a consonant

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Part C

1. Let U={1,2,3,4,5,6}, A={2,3},B={3,4,5}. Prove that $(A \cup B)' = A' \cap B'$

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2. Let $f(x) = x^2, g(x) = 2x + 1$ be two functions. Then find

(i) (f + g) (x) (ii) (f - g) (x) (iii) (fg) (x)

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3. Find the value of $\tan\left(\frac{\pi}{8}\right)$?

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4. Convert the complex number $-\frac{16}{1 + i\sqrt{3}}$ into polar form.

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5. If $(x+iy)^3 = u+iv$,then show that $\frac{u}{x}+\frac{v}{y}=4(x^2-y^2)$?

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6. How many words with or without meaning each of 3 vowels and 2 consonants can be formed from the letters of the word INVOLUTE.

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7. Find the middle term in the expansion of $\left(\frac{x}{3}+9y\right)^{10}$

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8. If the sum of three numbers in A.P is24 and their product is 440,find the numbers?

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9. Find the sum of the series, $7, 77, 777, 7777, \ldots\ldots\ldots\ldots$ to n tems.

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10. Find the equation of the parabola that satisfies the given conditions :

Vertex $(0, 0)$, passing through $(5, 2)$ and symmetric with respect to y-axis.

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11. Differentiate of $\sin x$ w.r.t. x from first principles

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12. Verify by the method of contradiction that $\sqrt{7}$ is irrational number

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13. 4 cards are drawn from a pack of 52 cards .What is the probability of obtaining 3 diamonds and a spade ?

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14. A die has faces each with number '1' three faces each with number'2' and one face with number '3' .If die is rolled once,determine (i) P(2) (ii) P(1 or 3) (iii) P(not 3) ?

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Part D

1. Define modulus function, draw the graph of it, write its domain and range.

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2. Prove that

$$\cos^2 x + \cos^2\left(x + \frac{\pi}{3}\right) + \cos^2\left(x - \frac{\pi}{3}\right) = \frac{3}{2}$$

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3.

$$1^2 + 2^2 + 3^2 + \ldots\ldots\ldots + n^2 = \frac{n(n+1)(2n+1)}{6} \forall n \in N.$$

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4. Solve the following system of inequalities graphically

$x + 2y \leq 8, 2x + y \leq 8, x \geq 0, y \geq 0.$

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5. A committee of 7 has to be formed from 9 boys and 4 girls. In how many ways can this be done when the committee consists of

(i) exactly 3 girls

(ii) atleast 3 girls?

(iii) atmost 3 girls?

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6. State and prove Bionomial theorem for any positive integer n.

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7. Derive the expression for the length of the perpendicular drawn from the point (x_1, y_1) yo the line $ax + by + c = 0$

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8. Derive the formula to find the co-ordinates of a point which divide the line joining the points $A(x_1, y_1, z_1)$ and $B(x_2, y_2, z_2)$internally in the ratio $m : n$.

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9. Prove that $\lim_{x \to 0} \left(\frac{\sin x}{x} = 1 \right)$?

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10. Find the mean deviation about the mean for the following data.

Marks obtained	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80
Number of students	2	3	8	14	8	3	2

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Part E

1. To

$\cos(A + B) = \cos x . \cos y - \sin x \sin$ and hence find $\cos 75^\circ$

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2. Find the sum to n terms series $1^2 + (1^2 + 2^2)(1^2 + 2^2 + 3^2) + \ldots\ldots$

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3. Define hyperbola as a set of points derive its equation in the form $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

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4. If $y = \frac{\sin x + \cos x}{\sin x - \cos x}$ find $\left(\frac{dy}{dx}\right)$?

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