MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

ANNUAL EXAMINATION QUESTION PAPER - 2019 (SOUTH) (WITH ANSWERS)

Part A I Answer All The Questions

1. Write the set $(x : x \in R \& -4 < x \leq 6)$ as an interval.

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2. Let A={1,2} and B={3,4}. Find the number of relations from A to B.

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3. Convert $\left(\frac{7\pi}{6}\right)^{e}$ into degrees.

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4. Find the conjugate of $\sqrt{3i} - 1$

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5. Find 'n' if $''C_7 = ''C_6$.

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6. Find the slope of the line $\frac{x}{3} + \frac{y}{2} = 1$

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7. Evaluate $\lim_{x \to 0} \frac{\cos x}{\pi - x}$

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8. Write the negation of "For every real number x,x is less than x +1 . "

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9. If $\frac{2}{11}$ is the probability of an event.What is the probability the event 'not A '

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Part B Ii Answer Any Ten Questions

1. If

$U = \{x : x \leq 10, \mathrm{x} \in N\} A = \{x : \mathrm{x} \in N, x \text{ is prime}\} B = \{x : \mathrm{x} \in N, x \text{ is}$

write $A \cap B$ in roster form.

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2. If

$U = \{x : x \leq 10, \mathrm{x} \in N\} A = \{x : \mathrm{x} \in N, x \text{ is prime}\} B = \{x : \mathrm{x} \in N, x \text{ is}$

write $A \cap B$ in roster form.

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3. If X and Y are two sets such that n (X) =17,n (Y) =23, and n $(X \cup Y) = 38$ find n$(X \cap Y)$

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4. The cartesian product $A \times A$ has 9 elements among which are found $(-1, 0, \&, 0, 1)$. Find the set A and the remaining elements of $A \times A$.

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5. If sin $A = \frac{3}{5}$ and A is in I quadrant then find sin2 A .

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6. Express $i^{18} + \left(\frac{1}{i}\right)^{25}$ in a + ib form.

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7. Solve $3x - 2 < 2x + 1$. Show the graph of the solution on number line.

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8. Find the equation of the straight line intersecting y - axis at a distance of 2 units above the origin & making an angle 30° with the positive direction of x-axis .

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9. Find the angle between the lines $y - \sqrt{3}x - 5 = 0$ and $\sqrt{3}y - x + 6 = 0$

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10. Show that the points (2, 3, 4), (-1, -2, 1), (5, 8, 7) are collinear.

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11. Evaluate $\lim_{x \to 3} \frac{x - 3}{x^2 - 5x + 6}$.

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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. The coefficient of variation for a distribution is 60 and standard deviation is 21. Find the arithmetic mean.

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14. 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 C Iii Answer Any Ten Questions

1. In a survey of 600 students in a school, 150 students were found to be taking tea and 225 taking coffee, 100 were taking both tea and coffee. Find how many students were taking neither tea nor coffee ?

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2. Solve $2\cos^2 x + 3\sin x = 0$

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3. Express $\frac{-1+i}{\sqrt{2}}$ in the polar form.

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4. Solve the equation $x^2 + \frac{x}{\sqrt{2}} + 1 = 0$

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5. How many words, with or without meaning can be made from the letters of the word MONDAY, assuming that no letter is repeated, if.

(i) 4 leters are used at a time,

(ii) all letters are used at a time

(iii) all letters are used but first letter is a vowel ?

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6. Find the term independent of x in the expansion of $\left(\frac{3}{2}x^2 - \frac{1}{3x}\right)$.

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7. The sum of first three of a G.P is $\frac{13}{12}$ and their product is -1 . Find the common ratio and the terms.

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8. Insert 3 arithmetic means between 8 & 24 .

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9. Find the equation of the parabola with vertex at the origin axis along x-axis and pass-ing through the point (2, 3) also find its focus.

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10. Differentiate of $\cos x$ w.r.t. x from first principles

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11. Verify by the method of contradiction that $\sqrt{2}$ is irrational .

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12. One card is drawn from a well shuffled deck of 52 cards. If each outcome is equally likely, calculate the probability that the card will be (a) a diamond (b) not a diamond (c) a black card.

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13. A fair coin with 1 marked on one face and 6 on the other and a fair die are both tossed Find the probability that the sum of numbers that turn up is (i) 3 (ii) 12

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Part D Iv Answer Any Six Questions

1. Draw the graph of the signum function write its domain and range.

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2. Prove that: $\frac{\cos 4x + \cos 3x + \cos 2x}{\sin 4x + \sin 3x + \sin 2x} = \cot 3x$

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

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4. Solve the following system of inequations in 2 variables graphically: $x + 2y \geq 20, 3x + y \leq 15$

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5. A group consists of 7 boys and 5 girls . Find the number of ways in which a team of 5 members can be selected so as to have atleast one boy and girl.

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6. State and prove Binomial theorem for a positive integer index.

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7. Find the co-ordinates of the foot of the perpendicular from the point $(-1, 3)$ to the line $3x - 4y - 16 = 0$

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8. Prove that $\lim_{\theta \to 0} \frac{\sin\theta}{\theta} = 1.$

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9. 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 Answer Any Ony Questions

1. (a)Derive geometrically that $\cos(x+y) = \cos x \cos y - \sin x \sin y$ .Hence deduce the valueof $\cos 75^\circ$

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2. (b) Find the derivative of $\frac{x^5 - \cos x}{\sin x}$ with respect to x.

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3. Define ellipse and derive its equation in the form $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1(a > b)$.

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4. Find the sum to n terms of the series $3 \times 8 + 6 \times 11 + 9 \times 14 + \ldots\ldots$.

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