



## MATHS

### BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

#### ANNUAL EXAMINATION QUESTION PAPER - 1

##### Section A

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

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2. Write the power set of the set  $A = \{a, b\}$

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3. Express  $\frac{5\pi^c}{3}$  in degree measure ?

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4. Write  $(1-i) - (-1+i6)$  in the form of  $a+ib$  ?

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5. Find 'n' if  ${}^nC_7 = {}^nC_6$ ?

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6. Find the tenth term of G.P . 5, 25, 125\_\_\_ ?

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7. Write the slope of the line  $3x+2y+1 = 0$  ?

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8. Evaluate :  $\lim_{x \rightarrow 2} \frac{x^4 - 16}{x - 2}$  ?

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9. Write the converse and contrapositive of " if a number is divisible by 9 then its is divisible by 3"

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

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1. If  $A \times B = \{(a, 1)(a, 2)(a, 3)(b, 1)(b, 2)(b, 3)\}$  find the sets A and B and hence find  $B \times A$ .

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2. If  $U = \{x : x \leq 10, x \in \mathbb{N}\}$   $A = \{x : x \in \mathbb{N}, x \text{ is prime}\}$   $B = \{x : x \in \mathbb{N}, x \text{ is even}\}$  write  $A \cap B$  in roster form.

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3. Find the range of the functions  $f(x) = \sqrt{x - 3}$ .

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4. A wheel makes 360 revolutions in one minute. Through how many radians does it turn in one second?

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5. If  $\sin A = \frac{3}{5}$  and A is in I quadrant then find  $\sin 2A$ .

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6. Write the multiplicative inverse of  $2 - 3i$  ?

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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  $30^\circ$  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 P(- 2 , 3, 5) , Q (1, 2, 3) and R(7, 0, -1) are collinear.

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11. Evaluate  $\lim_{x \rightarrow 0} \left( \frac{1 - \cos x}{x} \right)$  ?

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12. Find the component statements of the compound statement "All integers are positive or negative" ?

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13. Write the mean of the given data : 6,7,10,12,13,4,8,12 ?

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

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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. 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.  $\sin x + \sin 3x + \sin 5x = 0$



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4. Express  $1 + i\sqrt{3}$  in polar form



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

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6. Find  $r$ , if  $5 \times {}^4P_r = 6 \times {}^5P_{r-1}$ .

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7. Find the coefficient of  $x^6y^3$  in the expansion of  $(x + 2y)^9$

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8. The sum of first three terms of a G.P is  $\frac{39}{10}$  and their product is 1. Find the common ratio and the terms.

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9. Insert 3 arithmetic means between 8 and 24.

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10. Find the centre and radius of the circle  $x^2 + y^2 + 8x + 10y - 8 = 0$

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11. Compute the derivative of  $\sin x$  using first principal method ?

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

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13. If  $E$  and  $F$  are two events such that  $P(E) = \frac{1}{4}$ ,  $P(F) = \frac{1}{2}$  and  $P(E \text{ and } F) = \frac{1}{8}$ . Find  $P(\text{not } E \text{ and not } F)$



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14. 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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## Section D

1. Define a modulus function . Draw its graph. Also write down its domain and range.



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2. Prove that  $\frac{\sin 9x + \sin 7x + \sin 3x + \sin 5x}{\cos 9x + \cos 7x + \cos 3x + \cos 5x} = \tan 6x$  ?

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

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4. Solve the following system of inequalities graphically

$$2x + y > -4, x + y \leq 3, 2x - 3y \leq 6,$$

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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. If  $p$  is the length of perpendicular from origin to the line whose intercepts on the axes are 'a' and 'b' then prove that  $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$ .

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8. Derive section formula in three dimensions for internal division . Also find the co-ordinates of the midpoint of the line joining the points  $P(x_1, y_1, z_1)$  and  $Q(x_2, y_2, z_2)$  ?

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9. Prove that  $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$ .

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

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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## Section E

1. prove that  $\cos(A + B) = \cos A \cos B - \sin A \sin B$

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2. Find the sum to n terms of the series  $5 + 11 + 19 + 29 + 41 + \dots$

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3. Derive the equation of the ellipse in the form  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ .

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

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