MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

ANNUAL EXAMINATION QUESTION PAPER - 6

Section A

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

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2. If `(x+ 1,y -2) =(3,1) Find the values of x and y .

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3. Convert $\frac{2\pi}{3}$ radians into degree measue ?

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4. Evaluate $7! - 5!$.

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5. Find the 20^{th} term of the G.P $\frac{5}{2}, \frac{5}{4}, \frac{5}{8}, \ldots ?$

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

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7. Find the slope of the time passing through the points (3,-2) and (-1,4)

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8. Evaluate $\lim_{x \to 0} (\text{cosec } x - \cot x)$.

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9. Write the negation of statement $\sqrt{2}$ is not a complex number.

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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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Section B

1. If A and B are two disjoint sets and n (A) = 15 and n (B) = 10 find n $(A \cup B), N(A \cap B)$.

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

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3. Let $A = \{1, 2\}, B = \{3, 4\}$. Write $A \times B$. How many subsets will $A \times B$ have ?

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4. Find the value of $\sin 75^\circ$.

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5. Find the radius of the circle in which a central angle of 60° intercepts an arc of length 37.4 cm (use $\pi = \frac{22}{7}$)

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6. Express $\frac{1+3i}{1-2i}$ in the form $a + ib$.

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7. Solve $7x + 3 < 5x + 9$. Show the graph of the solution on number line.

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8. Find the equation of the line parallel to the line $3x - 4y + 2 = 0$ and passing through the point $(-2, 3)$

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9. Find the distance between the parallel line $(15x + 8y - 34) = 0$ and $(15x + 8y + 31) = 0$?

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10. Find the distance between the points (-3,7,2) and (2,4,-1).

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

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12. Write the contrapositive and converse of the statement. If two lines are parallel, then they do not intersect in the same plane.

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13. Coefficient of variation of distribution are 70 and the standard deviation is 16. What is the arithmetic mean of the distribution

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14. Three coins are tossed once.Find the probability of getting atleast two heads

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Section C

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

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2. Let fg: $R \to R$ be defined respectively by $f(x) = x + 1, g(x) = 2x - 3$. Find f+g, f-g and $\frac{f}{g}$.

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3. Find the general solution of the equation $\sin 2x + \cos x = 0$.

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

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

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6. In how many ways can the letters of the word PERMUTATIONS be arranged if (i) the words start P and end with S (ii) vowel are all together.

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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. Insert five numbers between 8 and 26 such that the resulting sequence is in AP.

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9. In an A.P if m^{th} term is n and n^{th} term is m, where $m \neq n,$ find the p^{th} term .

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10. Find the co-ordinate of the focus ,equation of the directrix and length of the Latus Rectum of the Parabola $\left(y^2 = 8x\right)$?

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11. Find the derivative of sin x with respect to x from 1st principal ?

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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 the evens such that $P(E) = \frac{1}{4}, P(F) = \frac{1}{2}$ and $P(E \text{ and } F) = \frac{1}{7}$. Find (i) P(E or F) (ii) P(not E and not F) ?

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14. A bag contain 9 discs of which 4 are red , 3 are blue and 2 are yellow . The discs are similar in shape and size . A disc is drawn at random from the bag . Calculate the probability that it will be (i) red (ii) yellow (iii) blue ?

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

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3. $1^3 + 2^3 + 3^3 + \ldots\ldots\ldots\ldots + n^3 = \frac{n^2(n+1)^2}{4} \forall n \in N.$

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4. Solve graphically $2x + y \geq 4, x + y \leq 3, 2x - 3y \leq 6x \geq 0, y \geq 0$

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5. A group consists of 4 girls and 7 boys .In how many ways can a team of 5 members be selected , if the term has (i) no girls (ii) atleast one boy and one girl ?

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6. Prove binomial theorem for positive integers

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7. Derive an expression for the co-ordinates of points that divides the linejoining points $A(x_1, y_1, z_1)$ and $B(x_2, y_2, z_2)$ internally in the ratio m:n.Hence find the co-ordinates of midpoint of AB where A=(3,2,1) and B=(7,6,5).

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8. Prove that $\lim_{\theta \to 0} \frac{\sin \theta}{\theta} = 1$, (θ being in radians) and hence show that $\lim_{\theta \to 0} \frac{\tan \theta}{\theta} = 1$?

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9. 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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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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Section E

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. Find the sum of the series $5, 55, 555, 5555, \ldots$ to n terms ?

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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. Find the derivative of $\left(\frac{x^3 - \cos x}{\sin x}\right)$ with respect to x ?

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