MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

PUE WEBSITE MODEL QUESTION PAPER - 8

Part A

1. Given that the number of subsets of a set . A is 16. Find th number of elements in A.

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2. If $\tan x = \frac{3}{4}$ and x lies in the third quadrant , find sin x.

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3. Find the modulus of $\frac{1+i}{1-i}$

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4. Find n if $.^{n}C_{9} = .^{n}C_{5}$.

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5. Find 20th term of G.P. $\frac{5}{2}, \frac{5}{4}, \frac{5}{8} - - - - - .$

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6. Find the distance between $3x + 4y + 5 = 0$ and $6x + 8y + 2 = 0$

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7. Given $f(x) = \begin{cases} \frac{x}{|x|} \\ 2 \\ x \neq 0 \\ x = 0 \end{cases}$ find $\lim_{x \to 0} f(x)$

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8. write the negation of 'For all $a, b \in I, a - b \in I'$.

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9. A letter is chosen at random from the word "ASSASSINATION" . Find the probability that letter is vowel.

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10. Let A = { 2, 3, 4} and R be relation on A defined by

$R = \{(x, y)(x, y \in A, x$ divides y } , find R.

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Part 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. 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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4. The difference btween two acute angles of a right angled triangle is $3\frac{\pi}{10}$ radians. Express the angles in degrees.

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5. Find $\sin.\frac{x}{2}$ if $\tan x = -\frac{4}{3}$ x lies in second quadrant.

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

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7. $CV = 60, \sigma = 21$?

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8. Write the inverse , converse of 'If a parallelogram is a square , then it is a rhombus.

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9. On her vacations Veena visits cities A,B C and D in random order . What is the probability that she visits A before B ?

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10. In a triangle ABC with vertices $A(2, 3), B(4, -1)$ and $C(1, 2)$. Find the length of the altitude from the vertex A .

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11. Represent the complex number $z = 1 + i$ in polar form.

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12. Obtain all paris of consecutive odd natural numbers such that in such that in each pair both are more than 50 and their sum is less than 120.

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13. A line cuts of equal intercepts on the coordinate axes. Find the angle made by the line with the positive x - axis.

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14. If the origin is the centroid of the triangle PQR with vertices $P(2a, 4, 6) Q(-4, 3b, -10)$ and $R(8, 14, 2c)$ then find the values of a , b , c .

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Part C

1. Out of a group of 200 students (who know at least one language), 100 students know English , 80 students know Kannada, 70 students know . Hindi . If 40 students know all the three languages . Find the number of students who know exactly two languages.

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2. Let $R: Z \to Z$ be a relation defined by $R = \{(a, b) : a, b, \in Z, a - b \in z)$. Show that

(i) $\forall a \in Z, (a, a) \in R$

(ii) $(a, b) \in R \Rightarrow (b, a) \in R$

(iii) $(a, b) \in R \Rightarrow (b, c) \in R \Rightarrow (a, c) \in R$

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3. Prove that $(\cos x + \cos y)^2 + (\sin x - \sin y)^2 = 4\cos^2\left(\frac{x+y}{2}\right)$

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4. Solve $\sqrt{2}x^2 + x + \sqrt{2} = 0$

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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. If $x + iy = \frac{2+i}{2-i}$ then prove taht $x^2 + y^2 = 1$

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

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8. $8, A_1, A_2, A_3, 24.$

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9. A committee of two persons is selected from two men and two women.How many ways can it be done when committee contains at least one man.

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10. A committee of two persons is selected from two men and two women.How many ways can it be done when committee contains at most one man

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

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12. A parabola with vertex at origin has its focus at the center of $x^2 + y^2 - 10x + 9 = 0$ Find its directrix and latus rectum.

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

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15. Two students Anil and Sunil appear in an examination. The probability that Anil will qualify in the examination is 0.05 and that Sunil Will qualify is 0.10. The probability that both will qualify in the examination is 0.02 find the probability that Anil and Sunil Will not qualify in the examination.

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Part D

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

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

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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. 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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5. State and prove the Pythagoras theorem.

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6. 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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7. Derive a formula for the angle between two lines with slopes m_1 and m_2. Hence the slopes of the lines which make an angle $\frac{\pi}{4}$ with the line $x - 2y + 5 = 0$

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

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9. Solve graphically $2x + y \geq 6$

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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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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 of the series $1^2 + (1^2 + 2^2) + (1^2 + 2^2 + 3^2) + \ldots .$

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3. An ellipse is the set of all points in a plane the sun of whose distance from two fixed points in the plane is a constant ?

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4. Find $\frac{dy}{dx}$ if $y = \frac{x^5 - \cos x}{\sin x}$

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