MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

MOCK QUESTION PAPER - 2

Part A

1. Define power set of a Set.

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2. If G={7,8} and H={5,4,2}, find $G \times H$ and $H \times G$.

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3. Convert 315° radians.

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4. Find the multiplicative inverse of 1+i.

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

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6. Write the first term of the sequence, whose nth term is $a_n = \frac{n}{n+1}$.

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7. Reduce $3x + 2y - 12 = 0$ into intercept form.

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8. Evaluate $\lim_{x \to 0} (x \sec x)$?

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9. Write the negation of the statement " The number 2 is greater then 7"

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10. Describe the sample space for the indicated experiments

A coin is tossed 3 times

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Part B

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

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2. 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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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. Find the angle in radians through which a pendulum swings if its lengts is 75 cm and the tip describes an are of length 10 cm

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5. Find the value of $\cos 15^\circ$.

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6. Express $\left(\frac{1}{3}+3i\right)^3$ in the form a+ib.

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7. Solve $3(1-x) < 2(x+4)$ and show the graph of the solution on number line.

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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. Given that P(3,2,-4),Q(5,4,-6) and R(9,8,-10) are collinear. Find the ratio in which Q divides PR.

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11. Evaluate : $\lim_{x \to 0} \left[\frac{(x+1)^5 - 1}{x} \right]$.

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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. A and B are events such that P(A) =0.42,P(B) =0.48 and P(A and B) =0.16 Determine (i) P(not A) ,(ii) P(not B) ,(iii) P (A or B)

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Part C

1. In a survey of 400 students in a school, 100 were listed as taking apple juice, 150 as taking orange juice and 75 were listed as taking both apple as well as orange juice. Find how many students were taking neither apple juice nor orange juice.

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

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

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

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6. In how many of distinct permutations of the letters in the word MISSISSIPPI do the 4 I's not some together?

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7. Find $(a+b)^4-(a-b)^4$.Hence evaluate $(\sqrt{3}+\sqrt{2})^4-(\sqrt{3}-\sqrt{2})^4$.

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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. 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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10. Find the eccenticity and length of latus rectum of the hyperbola $4x^2 - 9y^2 = 36.$

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11. Differentiate of $\cos x$ 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. A commiittee of two persons is selected from two men and two women.What is the probability that the committee will have (i) no

man ?(ii) one man ? (iii) two man ?

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14. A fair die is thrown .Describe the following events ?

(i) A : a number less than 4

(ii) B : a number greater than 7

(iii) C: a multiple of 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 : $\frac{\sin 5x - 2\sin 3x + \sin x}{\cos 5x - \cos x} = \tan x$

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3.

$$\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \ldots\ldots\ldots\ldots\ldots + \frac{1}{n(n+1)} = \frac{n}{n+1} \forall n \in N.$$

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4. Solve graphically the system of linear inequalities $4x + 3y \leq 60, y \geq 2x, x \geq 3, x, y \geq 0.$

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5. A group consists of 4 girls and 7 boys .In how ways can a team of 5 members be selected ,if the team has ?

(i) no girl

(ii) atleast one boy and one girl ?

(iii) at least three girls ?

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

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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 geometrically $\lim_{\theta \to 0} \frac{\sin \theta}{\theta} = 1$ ($\theta$is measured in radians)?

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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. Prove that geometrically that $\cos(x+y) = \cos x.\cos y - \sin x.\sin y$ and hence show that $\cos 2x = \cos^2 x - \sin^2 x.$

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

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

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