MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

ANNUAL EXAMINATION QUESTION PAPER - 2017 (SOUTH) (WITH ANSWERS)

Part A I Answer All The Questions

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 (x - 1, y + 3) = (2, x + 4) Find the values of x and y .

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

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4. Find the multiplicative inverse of $\sqrt{5}+3i$

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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 slope of the line $x-y+2=0$

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7. Write the negation of the statement " $\sqrt{7}$ is rational".

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

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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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Part B Ii Answer Any Ten Questions

1. If X and Y are two sets such that X $\cup Y$ has 18 elements, X has 8 elements and Y has 15 elements how many elements does X $\cap Y$ have ?

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2. If A={-1,1}, find $A \times A \times A$.

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3. Let $f(x) = \sqrt{x}$ and $g(x) = x$ find (i) (f + g) x

(ii) (fg) x

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4. The minute hand of a clock is 2.1cm long. How far does its tip move is 20 minute. $\left(\text{use}\pi = \frac{22}{7}\right)$

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5. Find the general solutions of $2\cos^2 x - 3\sin x = 0$

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6. Evaluate : $\lim_{x \to 1} \frac{x^{15} - 1}{x^{10} - 1}$

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7. Find the mean deviation about the median for the following data

3, 9, 5, 3, 12, 10, 18, 4, 7, 19, 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. Find the distance between $3x + 4y + 5 = 0$ and $6x + 8y + 2 = 0$

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12. Solve $4x + 3 < 6x + 7$

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13. Show that the points P(- 2 , 3, 5) , Q (1, 2, 3) and R(7, 0, -1) are collinear.

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

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

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3. $\tan 4x = \dfrac{4\tan x\left(1-\tan^2 x\right)}{1-6\tan^2 x+\tan^4 x}$

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4. If $x+iy=\sqrt{\dfrac{a+ib}{c+id}}$ Prove that $x^2+y^2=\sqrt{\dfrac{a^2+b^2}{c^2+d^2}}$

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

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

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7. 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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8. Find the foci and eccentricity of ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$

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9. How many terms of AP - $6 - 11/2, \ -5...$ are needed to give the sum - 25 ?

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

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

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13. A committee of two persons is selected from two men and two women.What is the probability that the committee will have (i) no men (ii)two men

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

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Part D Iv Answer Any Six Questions

1. Prove that $\lim_{x \to 0} \left(\frac{\sin x}{x} \right) = 1$ (x being in radians) and hence Show that $\lim (x \to 0) \left(\frac{\tan x}{x} \right) = 1$.

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2.

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

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3. Define modulus function, draw the graph of it, write its domain and range.

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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 Bionomial theorem for any positive integer n.

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6. 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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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. Prove that:

$$\frac{\cos 4x + \cos 3x + \cos 2x}{\sin 4x + \sin 3x + \sin 2x} = \cot 3x$$

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9. Solve graphically

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

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

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of girls	6	8	14	16	4	2

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Part E Answer Any One Question

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 to n terms series

$1^2 + (1^2 + 2^2)(1^2 + 2^2 + 3^2) + \ldots\ldots$

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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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