MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

ANNUAL EXAMINATION QUESTIONS PAPER-2016 (NORTH) (WITH ANSWERS)

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 $H \times G$.

3. Convert 315° radians.

4. Find the multiplicative inverse of 1+i.

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

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

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

8. Evaluate : $\lim_{x \to 0} x \sec x$.

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

10. Describe the sample space for the indicated experiments

A coin is tossed 3 times

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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 $\left(\dfrac{x}{3} + 1, y - \dfrac{2}{3} \right) = \left(\dfrac{5}{3}, \dfrac{1}{3} \right)$, find the values of x and y.

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

5. Find the value of $\cos 15°$.

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

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

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.

9. Find the angle between the lines $\sqrt{3}x + y = 1$ and $x + \sqrt{3}y = 1$

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 : $\lim\limits_{x \to 0} \left[\dfrac{(x+1)^5 - 1}{x} \right]$.

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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.

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)

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.

2. Let $f(x) = x^2$ and $g(x) = 2x + 1$ be two real values functions, find

$(f + g)(x)$

3. Let $f(x) = x^2$ and $g(x) = 2x + 1$ be two real values functions, find

$(f - g)(x)$

4. Let $f(x) = x^2$ and $g(x) = 2x + 1$ be two real values functions, find

$(fg)(x)$.

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

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

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

8. In how many of distinct permutations of the letters in the word

MISSISSIPPI do the 4 I's not some together?

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

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

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12. Find the eccenticity and length of latus rectum of the hyperbola

$4x^2 - 9y^2 = 36$.

13. Differentiate of $\cot x$ w.r.t. X from first principles

14. Verify by the method of contradiction that $\sqrt{7}$ is irrational number

15. 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

16. A committee of two persons is selected from two men and two women. What is the probability that the committee will have :

One man?

17. 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

18. A fair die is thrown. Describe the following events.

A: a number less than 4

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19. A fair die is thrown. Describe the following events.

B: a number greater than 7

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20. A fair die is thrown. Describe the following events.

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.

2. Prove that : $\dfrac{\sin 5x - 2\sin 3x + \sin x}{\cos 5x - \cos x} = \tan x$

3.

$$\dfrac{1}{1.2} + \dfrac{1}{2.3} + \dfrac{1}{3.4} + \dots\dots\dots\dots + \dfrac{1}{n(n+1)} = \dfrac{n}{n+1} \quad \forall n \in N.$$

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

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.

No girl?

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

exactly three girls?

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

At least three girls?

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

9. Derive the expression for the length of the perpendicular drawn from the point (x_1, y_1) yo the line $ax + by + c = 0$

10. 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).

11. Prove that $\lim\limits_{\theta \to 0} \dfrac{\sin \theta}{\theta} = 1.$

12. Find the mean deviation from the mean for the following data :

Classes	0--10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequencies	6	8	14	16	4	2

Part E

1. Prove that $\cos 2x = \cos^2 x - \sin^2 x.$

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

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

4. If $y = \dfrac{\sin x + \cos x}{\sin x - \cos x}$ find $\dfrac{dy}{dx}$.