MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

ANNUAL EXAMINATION QUSTIONS PAPER -2016 (SOUTH) (WITH ANSWERS)

Part A

1. Define power set of a Set.

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2. Let A={1,2} and B={3,4}. Find the number of relations from A to B.

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3. Convert $240°$ into radian measure.

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4. Solve the equation $x^2 + 3 = 0$.

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5. Evaluate $7! - 5!$.

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6. Write first three terms of the sequence $a_n = \dfrac{n-3}{4}$.

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7. Find the slope of the line $3x - 4y + 10 = 0$.

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8. Evaluate $\displaystyle\lim_{x \to 0} \left(\dfrac{\sin ax}{bx} \right)$.

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

10. Describe the sample space for the indicated experiments.

A coin is tossed three times and exactly one head appears.

1. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $A = \{2, 4, 6, 8\}$ and $B = \{2, 3, 5, 7\}$. Verify that : $(A \cup B)' = A' \cap B'$

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2. If X and Y are two such that $n(X) = 17, n(Y) = 23$ and $n(X \cap Y) = 5$, find $n(X \cup Y)$.

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3. Find the domain and range of the following real functions:

(i) $f(x) = -|x|$, (ii) $f(x) = \sqrt{9 - x^2}$

4. Find the value of $\sin 75°$.

5. A wheel makes 360 revolutions in one minute. Through how many radians does it turn in one second?

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

7. Solve $3x - 2 < 2x + 1$. Show the graph of the solution on number line.

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

9. Find the equation of the line through the points (1,-1) and (3,5).

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

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

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. One card is drawn from a well shuffled deck of 52 cards.If each out come is equally likely calculated the

probability that the card will be

(i) a diamond

(ii) not a diamond

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15. One card is drawn from a well shufflied deck of 52 cards.If each out come is equally likely, calculate the probability that card will be

Not an ace.

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Part C

1. In a class of 35 students, 24 like to play cricket and 16 to play football. Also each student like to play atleast one of the two games. How many students like to play both cricket and football ?

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

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

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

5. Find the conjuate of $\dfrac{(3 - 2i)(2 + 3i)}{(1 + 2i)(2 - i)}$.

6. Find r if $.^5 P_r = .^6 P_{r-1}$

7. Using binomial theorem, compute $(98)^5$.

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8. If the sum of a certain numbe of terms of the A.P. 25 ,22 ,19 ...... is 116 . Find the last term .

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9. 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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10. Find the co-ordinates of the foci, eccentricity and length of the latus rectum of the hyperbola $16x^2 - 9y^2 = 144$

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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 $P: \sqrt{5}$ is irrational.

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13. If E and F are events such that $P(E) = \dfrac{1}{4}$, $P(F) = \dfrac{1}{2}$ and $P(E \text{ and } F) = \dfrac{1}{8}$. Find P(E or F).

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

15. A bag contains 9 dics 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 be

Red.

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16. A bag contains 9 dics 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 be

Yellow.

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17. A bag contains 9 dics 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 be

Blue.

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Part D

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

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

3.

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

4. Solve the inequalities graphically,

$x + 2y \le 8, \; 2x + y \le 8, \; x \ge 0, \; y \ge 0.$

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?

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6. A group consists of 4 girls and 7 boys. In how ways can a team of 5 members be selected, if he team has. At least one boy and one girl?

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

At least three grils?

8. State and prove Binomial theorem for all the integers.

9. Derive the equation of a straight line having the intercepts 'a' & 'b' on the X ane Y-axes respectively.

Hence find the equation of the line intercepts -3 and 2 on the X and Y-axes respectively.

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 $\lim_{\theta \to 0} \dfrac{\sin \theta}{\theta} = 1.$

12. 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

Part E

1. Prove that geometrically that

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

2. Find the sum of the series, $7, 77, 777, 7777, \ldots \ldots \ldots$ to n tems.

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 $\dfrac{dy}{dx}$.