MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

ANNUAL EXAMINATION QUESTION PAPER - 2018 (NORTH) (WITH ANSWERS)

Part A I Answer All The Questions

1. If $A = \phi$ the empty set, then write the number of elements in P(A).

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2. If A = {1, 2} and B = {3, 4} then write $A \times B$.

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3. Convert 240° into radian measure.

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4. write the additive inverse of the complex number 4-3i

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

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6. If $a_n = \frac{n^2}{2^n}$, then find a_7.

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7. Find the slope of the time passing through the points (3,-2) and (-1,4)

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8. Evaluate $\underset{x-0}{\text{Lim}} \frac{ax+b}{cx+1}$

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

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10. A coin is tossed 3 times and the outcomes are recorded. How many possible outcomes are there ?

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Part B Ii Answer Any Ten Questions

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

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2. If $A = \{1, 2, 3, 4, 5, 6\}$, $B = (2, 4, 6, 8\}$, then find A - B and B - A.

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3. Let A = { 1, 2, 3, 4, 5, 6} . Define a relation R from A to A by R = { (x , y) : y = x + 1} . Depict the relation using an arrow diagram.

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4. Find the radius of the circle in which a central angle of 60° intercepts an arc of length 37.4 cm (use $\pi = \frac{22}{7}$)

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5. Find the value of $\sin\left(\frac{31\pi}{3}\right)$.

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6. Find the modulus and the argument of the complex number $-\sqrt{3} + i$

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7. Solve $7x + 3 < 5x + 9$. Show the graph of the solution on number line.

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8. Find the equation of the line, which makes intercepts -3 and 2 on X and Y-axes respectively.

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9. Find the distance of the point (3,-5) from the line $3x - 4y - 26 = 0$

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10. The centroid of a triangle ABC is at the point (1,1,1) . If the co-ordinates of A and B are (3, -5,7} and (-1,7,6) respectively find the coordinates of the point C .

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11. Evaluate $LT_{x \to 0}\left(\frac{\sin ax}{\sin bx}\right)$.

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12. The coefficient of variation for a distribution is 60 and standard deviation is 21. Find the arithmetic mean.

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13. A and B are two events such that P(A) =0.54,P(B) =0.69 and $P(A \cap B) = 0.35$. Find

$(a)P(A \cup B)(ii)P(A' \cup B')(iii)P(A \cap B')(iv)P(B \cap A')$

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Part C Answer Any Ten Questions

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 ?

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

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5. If $\left(\frac{1+i}{1-i}\right)^{2m} = 1$, then find the least integral value of m.

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

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7. Find the middle term in the expansion of $\left(\frac{x}{3} + 9y\right)^{10}$

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

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10. Find the coordinates of the vertices, length of the latus rectum and eccentricity of the ellipse

$$\frac{x^2}{49} + \frac{y^2}{36} = 1$$

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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 die is thrown once Find the probability that a prime numbers will appear

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14. A die is thrown. Find the probability that

(i) A prime number will appear.

(ii) A number greater than or equal to 3 will appear.

(iii) A number more than 6 will appear.

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15. A die is thrown. Find the probability that

(i) A prime number will appear.

(ii) A number greater than or equal to 3 will appear.

(iii) A number more than 6 will appear.

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16. Out of 100 students,two sections of 40 and 60 are formed.If you and your friend are among the 100 students,what is the probability that

(a) you both enter the same section ?(b) you both enter the different section?

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

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

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19.

$1.2 + 2.3 + 3.4 + \ldots\ldots\ldots\ldots + n(n+1) = \frac{n}{3}(n+1)(n+2)\,\forall n \in N.$

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20. Solve graphically $2x + y \geq 4, x + y \leq 3, 2x - 3y \leq 6x \geq 0, y \geq 0$

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21. What is the number of ways of choosing 4 cards from a pack of 52 cards ? In how many of these

Four cards are of same suit

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22. What is the probability that 4 cards drawn at random from a well-shuffled pack of playing cards belong to different suits?

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23. What is the number of ways of choosing 4 cards from a pack of 52 cards ? In how many of these Four cards are face cards

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24. What is the number of ways of choosing 4 cards from a pack of 52 cards ? In how many of these

Two cards are red cards and two are black cards.

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25. Prove that the Binomial theorem $(a+b)^n = {}^nC_0 a^n + {}^nC_1 a^{n-1} b + {}^nC_2 a^{n-2} b^2 + .. {}^nC_n b^n$ for any positive integer 'n'.

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26. Derive the formula to find the angle between two lines with slopes m_1 and m_2

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27. 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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28. Prove that $\underset{x \to 0}{\text{Lim}} \frac{\sin x}{x} = 1$ (x being measured in radians)

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29. Compute the mean deviation about the mean for the following data.

C.I.	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	2	10	20	15	10	3

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Part E V Answer Any One Questions

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 of the series

$$\frac{1}{1\times 2} + \frac{1}{2\times 3} + \frac{1}{3\times 4} + \ldots\ldots$$

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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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