MATHS

BOOKS - S CHAND MATHS (ENGLISH)

MODEL TEST PAPER-1

Section A

1. The value of $\cos(-1710^\circ)$ is equal to

A. $\frac{1}{2}$

B. $-\frac{1}{\sqrt{2}}$

C. 0

D. $-\frac{1}{2}$

Answer: C

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2. $5\sin\theta.\ \sin 8\theta =$

A. $\frac{3}{2}(\cos 7\theta - \cos\theta)$

B. $\frac{5}{2}(\cos 9\theta - \cos 7\theta)$

C. $\frac{5}{2}(\cos 7\theta - \cos 9\theta)$

D. none of these

Answer: C

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3. If $f(x) = 9x - x^2, x \in R$, then $f(a+1) - f(a-1)$ is equal to

A. $4(4-a)$

B. $2(9-2a)$

C. $4(2+a)$

D. $2(4+a)$

Answer: B

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4. If n is any integer, then the value of $\left(-\sqrt{-1}\right)^{4n+3}$

A. $2i$

B. $-i$

C. i

D. 0

Answer: C

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5. The triple (x, y, z) is chosen from the set $\{1, 2, 3, \ldots\ldots\ldots, n\}$, such that $x \leq y < z$. The number of such triples is

A. n^3

B. $.^n C_3$

C. $.^n C_2$

D. $.^n C_3 + .^n C_2$

Answer: D

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6. If $A = \{1, 2, 3, 4, 5, 6, 7, 8\}$ and $B = \{1, 3, 4, 6, 7, 8, 9\}$ then

A. (a) $A - B = B - A$

B. (b) $A - B \neq B - A$

C. (c) $(A - B) \cup (B - A) = B$

D. (d) none of these

Answer: B

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7. If the third term of a G.P. is 42, then find the product of its first five terms

A. (a) 42

B. (b) 42^5

C. (c) 98

D. (d) 25^5

Answer: B

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8. If $\lim_{x \to \frac{\pi}{2}} \frac{2^{-\cos x} - 1}{x\left(x - \frac{\pi}{2}\right)} = \frac{2}{\pi} \log k, k > 0$, the k is equal to

A. 2

B. 4

C. $\frac{1}{2}$

D. none of these

Answer: A

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9. The value of k so that $x + 3y + k = 0$ touches the circle $x^2 + y^2 + 6x + 2y = 0$ is

A. 10

B. 8

C. 16

D. 4

Answer: C

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10. Equation of line mid-parallel to the lines $3x + 4y = 12$ and $3x + 4y = 2$ is

A. $4x + 3y = 7$

B. $3x + 4y + 7 = 0$

C. $3x + 4y = 7$

D. $3x + 4y = 0$

Answer: C

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11. The probability that at least one of the events A and B occurs is 0.6. If A and B occur simultaneously with probability 0.2, find $P(\overline{A}) + P(\overline{B})$

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12. What is the smallest positive integer n for which $(1+i)^{2n} = (1-i)^{2n}$?

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13. Form an equation with real coefficients one of whose roots is $\frac{1}{-2+i}$

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14. If $f(x) = \frac{x-4}{2\sqrt{x}}$, then find $f'(1)$

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15. Find the seventh term from the beginning in the expansion of $\left(\sqrt[3]{\sqrt{2}} + \frac{1}{\sqrt[3]{\sqrt{3}}}\right)^n$

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16. If $(a, -2)$ and $(4, b^2)$ belong to the relation R where $R = \{(x, y) : x, y \in I, y = 2x - 4\}$ then find the values of a and b.

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17. If $n(\xi) = 40$, $n(A) = 25$ and $n(B) = 20$, then find the lest value of $n(A \cap B)$.

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18. If $\cos\alpha + \cos\beta = 0 = \sin\alpha + \sin\beta$, then prove that $\cos 2\alpha + \cos 2\beta + 2\cos(\alpha + \beta) = 0$

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19. If $\sin\alpha = -\frac{3}{5}$ and α lies in the third quadrant then find the value of $\cos.\frac{\alpha}{2}$

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20. Find the value of $\sqrt{3}\operatorname{cosec}20^\circ - \sec 20^\circ$

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21. In how many ways can the letters of the word ASSASSINATION be arranged so that all the S's occur together ?

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22. There are 3 books of Mathematics, 4 of Physics and 5 of English. How many different collections can be made such that each consists at least one book of each subject ?

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23. Find the domain and range of the function f given by $f(x) = 2 - |x - 5|$

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24. Solve : $\tan^2 x \cdot \tan^2 3x \cdot \tan 4x = \tan^2 x - \tan^2 3x + \tan 4x$

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25. Prove that $\tan\left(\theta + \frac{\pi}{6}\right) + \cot\left(\theta - \frac{\pi}{6}\right) = \frac{1}{\sin 2\theta - \sin. \frac{\pi}{3}}$

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26. Using mathematical induction prove that $n^3 - 7n + 3$ is divisible by 3, $\forall n \in N$

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27. Differentiate by 1^{st} principle : $f(x) = \sqrt{3x-4}$

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28. $\lim_{x \to -1} f(x)$ exists, find c given $f(x) = \{(x+2, x \leq -1), (cx^2, x > -1)\}$

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29. Solution of 9% acid is to be diluted by adding 3% acid solution to it. The resulting mixture is to be more than 5% but less than 7% acid, If there is $460L$ of the 9% solution, how many litres of 3% solution will have to be added

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30. Prove that the roots of $(a-b)^2x^2+2(a+b-2c)x+1=0, a<b,$ are real or imaginary according as c does not or does lie between a and b.

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31. Find the sum of n terms of the following series

$5+7+13+31+85+\ldots\ldots\ldots\ldots$

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32. Find the equation of the circle passing through the point $(7,3)$ having radius 3 units and whose centre lies on the line $y=x-1$

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33. The equations of perpendicular bisectors o the sides AB and AC of a triangle ABC are $x-y+5=0\,and\,x+2y=0$ respectively. If the point

$A\ is\ (1,\ -2),$ find the equation of the line BC.

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34. Find the mean and standard deviation from the following data :

x	$1 \le x < 3$	$3 \le x < 5$	$5 \le x < 7$	$7 \le x < 10$
f	6	4	5	1

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35. $\left(3+\omega+3\omega^2\right)^4 = \lambda\omega$, then value of λ is :

A. 4

B. -4

C. 16

D. -8

Answer: c

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36. The number of ways can the letters of the word FORECAST taken 3 at a time and the word MILKY taken 2 at a time be arranged are:

A. 62700

B. 67700

C. 61200

D. 67200

Answer: d

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37. In a ΔABC, if a = 3, b = 5 and c = 7, find cos c

A. $\frac{1}{2}$

B. $\frac{1}{\sqrt{2}}$

C. $-\frac{1}{2}$

D. 1

Answer: c

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38. If $\theta = -1440^\circ$, then $\tan\theta$ is

A. 1

B. 0

C. -1

D. $\sqrt{3}$

Answer: b

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39. The range of the function $f(x) = \dfrac{x+1}{x-2}$ is

A. A. {1}

B. B. R

C. C. $R - \{1\}$

D. D. $R - \{2\}$

Answer: c

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40. HCF of 3!, 4! and 5! is k!, then k =

A. 3

B. 4

C. 6

D. 60

Answer: c

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41. If one root of $x^2 + x + 1 = 0$ is $\frac{-1 + \sqrt{3}i}{2}$, then other root is :

A. A. $\frac{-1 - \sqrt{3}i}{2}$

B. B. $\frac{1 - \sqrt{3}i}{2}$

C. C. $\frac{1 - \sqrt{3}i^2}{2}$

D. D. $\frac{1 + \sqrt{3}t}{2}$

Answer: a

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42. In the binomial expansion of $\left(3\sqrt{3} + \sqrt{2}\right)^5$, the term which does not contain irrational number is :

A. 1^{st}

B. 3^{rd}

C. 4^{th}

D. 5^{th}

Answer: b

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43. Evaluate : $\lim_{x \to 4} \frac{\sqrt{x} - 2}{x - 4}$

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44. Find the probability of product of a perfect square when 2 dice are thrown together.

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45. If $y = \sqrt{3x + 2}$, Prove that $y\frac{dy}{dx} = \frac{3}{2}$

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46. Find the equation of the circle which touches both axes in 4^{th} quadrant and whose radius is r.

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47. Find the area of the triangle formed by the lines $y - x = 0, x + y = 0$and $x - k = 0.$

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48. If A and B are stes, then $A \cap (A \cup B) =$

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49. If p is a real number and if the middle term in the expansion of $\left(\frac{p}{2} + 2\right)^8$ is 1120, find p.

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50. if A and B are two sets, then prove that, $(A \cup B)' \cup (A' \cap B) = A'$.

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51. If A = {1, 2, 3, 4} and B= {1, 2, 3, 4, 5, 6} are two sets and function $F: A \to B$ is defined by $f(x) = x + 2$, $\forall x \in A$, then prove that the function is one-one and into.

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52. Prove that : $\sin^2 6x - \sin^2 4x = \sin 2x \cdot \sin 10x$

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53. Find the value of $\cos^2\left(\frac{\pi}{6} - \frac{\theta}{2}\right) - \sin^2\left(\frac{\pi}{6} + \frac{\theta}{2}\right)$.

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54. Prove that $\frac{1-\cos\theta+\sin\theta}{1+\cos\theta+\sin\theta}=\tan\frac{\theta}{2}$.

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55. Locate the point representing the complex number z on the Argand diagram for which

$|i-1-2z|>9$.

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56. If α,β be the roots of $px^2-qx+q=0$, then show that $\sqrt{\frac{\alpha}{\beta}}+\sqrt{\frac{\beta}{\alpha}}-\sqrt{\frac{q}{p}}=0$.

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57. In a class of 30 pupils, 12 Chemistry, 16 take Physics and 18 take History. If all the 30 students take at least one subject and no one take all three, then find the number of pupils taking 2 subjects.

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58. If the two sides of a triangle of a triangle and the included angle are given by $a = \sqrt{3} + 1, b = 2$ and $C = 60^\circ$, find the other two angles and the third side.

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59. If $\sec(\phi + \alpha) + \sec(\phi - \alpha) = 2\sec\phi$, prove that $\cos\phi = \pm\sqrt{2}\cos\frac{\alpha}{2}, \left(\phi \neq \frac{\pi}{2}\right)$.

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60. Prove by the method of mathematical induction that, $3^{2n+2} - 8n - 9$, $\forall n \in N$ is divisible by 64.

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61. If $y \log x = x - y$, prove that $\frac{dy}{dx} = \frac{\log x}{(1 + \log x)^2}$

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62. Differentiate $f(x) = \tan 2x$ by first principle of differentiation.

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63. The first term of an A.P. is the same as that of a G.P., the common difference of the A.P. and the common ratio of the G.P. are both 2. If the sum of the first five terms of each series be the same, find the 6^{th} term of each series.

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64. Find sum to first n groups of : $(1+3+9+27)+\ldots..$

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65. Draw the graphs of the following system of inequations and indicate the solution set.

$2x+3y \geq 6, 2x+y \geq 4, x \geq 4$ and $y \leq 3.$

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66. The straight line $2x+3y=24$ meets the x-axis at P and the y-axis at Q. The perpendicular bisector of PQ meets the line through (-2,0) parallel to the y-axis at R. Find the area of the $\Delta PQR.$

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67. Find the equation of the circle which has radius 5 units and which is tangent to the line $3x + 4y - 16 = 0$ at the point (4, 1).

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68. Calculate the standard deviation of the following distribuition :

Age	20 – 25	25 – 30	30 – 35	35 – 40	40 – 45	45 – 50
No. of persons	170	110	80	45	40	35

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Section B

1. The equation of the latus retum of the parabola $x^2 + 4x + 2y = 0$ is

A. $2y + 1 = 0$

B. $2y = 3$

C. $2y = -3$

D. $2y - 1 = 0$

Answer: B

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2. The length of a side of the square if the extermities of its one diagonal are $(1, -2, 3)$ and $(2, -3, 5)$ is

A. $\sqrt{3}$

B. $\sqrt{6}$

C. $2\sqrt{3}$

D. $2\sqrt{6}$

Answer: A

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3. The length of latus rectum and the length of conjugate axis of a hyperbola are $4\sqrt{3}$ and $2\sqrt{3}$ respectively. Find the length of semi transverse axis

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4. Identify the quantifier in the following statement :

"For all real numbers x and y, xy=yx"

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5. Find the length of the latus rectum of the ellipse $9x^2 + 16y^2 = 144$

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6. If p, q and r are simple propositions with truth values T,F,T then what is the truth value of $[(\sim p \vee q) \wedge -q] \rightarrow p$.

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7. Write the contrapositive statement of the proposition $p \rightarrow \sim q$

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8. In an ellipse if the lines joining focus to the extremities of the minor axis from an equilateral triangle with the minor axis then find the eccentricity of the ellipse.

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9. Find the coordinates of the centre , foci, and ends points of latus rectum of the hyperbola $9x^2 - 16y^2 + 18x - 64y - 199 = 0$. Also find the length of axes.

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10. Find the co-ordinates of point P which is five sixth of the way from $A(-2, 0, 6)$ and $B(-10, -6, -12)$

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11. The distance between x-axis and the point (3, 12, 5) is

A. A. 31 units

B. B. 13 units

C. C. 10 units

D. D. 9 units

Answer: b

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12. The point on the parabola $y^2 = 12x$ with focal distance equals to 12 units is

A. $\left(9, 8\sqrt{3}\right)$

B. $\left(9, \sqrt{3}\right)$

C. $\left(8\sqrt{3}, 9\right)$

D. (9, 9)

Answer: a

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13. The minor axis of the ellipse having eccentricity is $\frac{1}{2}$ and vertices (4, 0) and (10, 0) is x = k, then value of k is

A. 9

B. -7

C. 7

D. -9

Answer: c

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14. Find the z-coordinate of the point on XOZ plane divides the join of (5, -3, -2) and (1, 2, -2) .

A. 2

B. -2

C. 0

D. $\frac{13}{5}$

Answer: b

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15. Write the negation of the following statements: 'For every real number x, $x^2 > x$.'

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16. Using truth table, prove that : $\sim[(\sim p) \wedge q]$ is logically equivalent to $p \vee (\sim q)$.

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17. Check the validity of the statement: 'Two lines in a plane either intersect at a point or they are parallel.'

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18. Find the equation of ellipse having vertices at $(\pm 5, 0)$ and foci $(\pm 4, 0)$.

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19. A hyperbola passes through (3, 3) and the length of its conjugate axis is 8. Find the length of the latus rectum.

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20. Find a point on X-axis which is equidistant from both the points (1, 2, 3) and (3, 5, -2) .

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Section C

1. Given $\sum\left(\frac{P_1}{P_0}\times 100\right)=611.6$ and Commodities are A,B,C,D and E then index number equal to

A. 123.32

B. 122.23

C. 132.22

D. 123.23

Answer: A

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2. If $Q_1 = 153, P_{75} = 155$, then coefficient of quartile devision is

A. 2

B. 1

C. 154

D. $\frac{1}{154}$

Answer: D

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3. Find the mode of the following data

0,1,2,1,3,3,2,1,0,3,2,1,4,2,0,3,3,2,1,4,2,1,3,3,1.

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4. The wholesale price index of the rice in 2016 compared to 2010 is 148. If the cost of rice was $Rs.\ 46$ per kg in 2010, calculate the cost in 2015

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5. For two firms A and B belonging to the same industry the following data is given

	Firm-A	Firm-B
Number of employees	586	648
Variance	100	121
$\lvert\bar{x} - \bar{x}_i\rvert$	2.63	2.37

Find the combined variance of the two firms

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6. The median of the following observations arranged in the ascending order is 42. Find x :

$22, 24, 33, 37, x+1, x+3, 44, 47, 51, 58.$

Also find the upper quartile

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7. Given below is distribution of daily earnings of 60 workers in a factory

More than (in ₹)	240	210	180	150	120	90	60
Number of workers	0	4	27	39	50	57	60

Find 45^{th} percentile.

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8. Calculate the coefficient of correlation between income and weight

Income (in ₹)	100	200	300	400	500	600
Weight (lbs)	120	130	140	150	160	170

Comment on the result

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9. The marks of 8 students in an examination in Statistics and Mathematics are given below

Marks in Statistics	62	47	53	60	55	68	51	48
Marks in Mathematics	70	48	58	55	54	50	60	52

Find Spearman's rank Correlation coefficient.

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10. Calculate the 5 yearly moving averages of the following time series of steel production `

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Production (in tonnes)	442	427	467	502	512	515	520	527	515	541

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11. D_3 for data: 16, 21, 27, 13, 19, 26, 25, 12, 17, 28 is

A. (a) 16

B. (b) 17

C. (c) 19

D. (d) 12

Answer: a

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12. D_9 is always equal to

A. P_9

B. a_3

C. P_{99}

D. P_{90}

Answer: d

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13. Q_2 for the data: 13, 16, 28, 17, 12, 25, 26, 19, 27, 21 is :

A. 21

B. 19

C. 20

D. 25

Answer: c

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14. The price index of a commodity in 2018 relative to 2015 is 125, If the price of the commodity is Rs. 20/kg is 2015, then price in 2018 is :

A. 20

B. 145

C. 25

D. 125

Answer: c

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15. Find the index number by using simple aggregate method.

Commodity	A	B	C	D	E
Base price (in ₹)	36	30	130	40	110
Current price (in ₹)	54	50	155	35	110

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16. Calculate the median and sixty first percentile from the following data of marks obtained by 10 students in an examination. 22, 26, 30, 14, 35, 11, 18, 12, 32, 41.

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17. The following table gives the distribution of 100 families according to expenditure. If mode of the distribution is 124, find the missing frequencies.

Expenditure	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
No. of families	14	?	27	?	15

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18. Calculate Spearman's rank correlation coefficient between the marks in Mathematics and Accountancy by 9 students.

Marks in Mathematics	35	23	47	17	10	43	9	6	28
Marks in Accountancy	30	33	45	23	8	49	12	4	31

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Section A

1. Value of $\frac{\tan^2 15^\circ - 1}{\tan^2 15^\circ + 1}$

A. $\frac{1}{2}$

B. $\frac{\sqrt{3}}{2}$

C. $-\frac{\sqrt{3}}{2}$

D. $\frac{1}{\sqrt{3}}$

Answer: C

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2. In Δ ABC if $\angle C = 75^\circ$, $\angle B = 45^\circ$, $a = 2$, then b equals to

A. $\frac{4}{\sqrt{6}}$

B. $\frac{\sqrt{6}}{4}$

C. 1

D. None of these

Answer: A

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3. Let A = {p, q, r} and B = {1, 2}. Then the number of relations from A to B is :

A. 32

B. 8

C. 4

D. 64

Answer: D

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4. Which term of the A.P. 10 - 8i, 8 - 6i, 6 - 4i,....is purely real ?

A. 5^{th} term

B. 6^{th} term

C. 4^{th} term

D. None of these

Answer: A

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5. Solution of : $-x^2 + 6x - 5 \geq 0$ is

A. [5, 1]

B. [5, 1)

C. (1, 5)

D. [1, 5]

Answer: D

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6. The sum of the components of a and b in the expansion of $(a + b)^n$ is

A. n

B. n^2

C. 2n

D. n + 1

Answer: A

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7. Given that $1, \omega, \omega^2$ are the centre roots of unity, the value of

A. 2

B. 8

C. 1

D. -1

Answer: C

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8. If the line $y = \sqrt{3}x + k$ touches the circle $x^2 + y^2 = 16$, then the value of k is

A. 16

B. 8

C. $+8$

D. $+16$

Answer: C

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9. Evaluate : $\lim_{x \to 2} \frac{\sqrt{2x} - 2}{x - 2}$

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10. Differentiate with respect to 'x' : $x^4 + 4^x + \log x$.

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11. A coin is tossed. If it shows a tail, we draw a ball from a bag containing 2 Red and 3 Green balls. If it shows head, we draw a ball from a bag containing 1 Blue and 1 White ball. Write the sample space. Also find the n(S).

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12. How many numbers of 6 digits can be formed out of the digits of the number 567724 ?

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13. Find the equation of a line parallel to y-axis and at a distance of 7 units to the left of y-axis.

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14. Let U = {1, 2, 3, 4, 5, 6}, A = {2, 3} and B = {3, 4, 5}. Find (B - A)'.

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15. Find the number of term in the expansion of $(x + y + z)^n$.

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16. Let A = {a, e, i, o, u}, B = {a, e, i}, C = {i, o, u}. Find all sets X such that $X \subset B$ and $X \subset C$.

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17. Find the principal solution of the equation cot x = - 1

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18. If x is real, prove that $5x^2 - 8x + 6$ is always positive and find its minimum value.

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19. Find the domain of the function $f(x) = \frac{1}{\sqrt{[x] - x}}$. Justify.

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20. Given $\cos 330^\circ = \frac{\sqrt{3}}{2}$, then find the value of $\sin 165^\circ$ and $\cos 165^\circ$.

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21. Using definition, find the derivative of $f(x) = \tan x^2$.

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22. Find the set of values of x for which the inequalities $x^2 - 3x - 10 < 0$.

$10x - x^2 - 16 > 0$ hold simultaneously.

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23. If $\frac{2}{3} = \left(x - \frac{1}{y}\right) + \left(x^2 - \frac{1}{y^2}\right) + \ldots$ to ∞ and xy = 2, then find the value of x and y with the condition that $|x| < 1$.

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24. Find the sum of : 2 + 5 + 10 + 17 + 26 + ... to n terms.

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25. Find the area of the triangle formed by the lines whose equations are $2y - x = 5$, $y + 2x = 7$ and $y - x = 1$.

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26. Circles are drawn to touch three straight lines $y = 0$, $y = 4$ and $2x + y = 2$. Find the equations of the circles.

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27. Find the variance and standard deviation from the following table giving the age distribution of 540 members of a Parliament :

Age in Years	30	40	50	60	70
Number of members	64	132	153	140	51

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Section B

1. Consider the parabola given by the equation $(x-3)^2+(y-3)^2=k(x+y-2)^2$. Then the value of k is

A. 1

B. 2

C. $\frac{1}{2}$

D. None of these

Answer: C

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2. The foci of the hyperbola $\frac{(x-1)^2}{25}-\frac{(y+1)^2}{16}=1$ are :

A. $(1+\sqrt{41},\ -1)$

B. $(-1, 1+\sqrt{41})$

C. $(-1+\sqrt{41},\ -1)$

D. $\left(1, \ -1+\sqrt{41}\right)$

Answer: A

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3. Distance between the points (7, 4, -5) and (1, 6, -2) is

A. 5 units

B. 4 units

C. 1 units

D. 7 units

Answer: D

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4. $9x^2 - 24xy + 16y^2 - 6x + 8y - 5 = 0$ represent a

A. parabola

B. circle

C. ellipse

D. hyperbola

Answer: A

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5. $q \rightarrow p$ is False when .....

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6. If x = 5 and y = -2 then x - 2y = 9. Write the contrapositive of this proposition.

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7. Write the negation of the statement $\sim p \rightarrow (q \vee r)$

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8. Find the area of the triangle formed by the lines joining the vertex of the parabola $x^2 = 12y$ to the ends of its latus rectum.

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9. Find the equation of hyperbola having foci $(+4, 0)$ and length of the latus rectum is 12.

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10. Find the ratio in which the zx plane divides the join of the points (2, 4, 5) and (3, -6, 8). Find also the co-ordinates of the point of intersection of join and the zx plane.

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Section C

1. If u = ax + b, u = cy + d, then Cov(u, v) = k Cov(x, y). Value of k is

A. $\frac{a}{c}$

B. $\frac{c}{a}$

C. ac

D. None of these

Answer: C

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2. If $\frac{1}{4} \leq |r| < \frac{3}{4}$, then correlation is said to be

A. High degree

B. Low degree

C. Moderate degree

D. None of these

Answer: C

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3. If m items have common rank, the correction to be added is $k\left(m^3 - m\right)$. Value of k is

A. 15

B. $\frac{1}{10}$

C. 12

D. $\frac{1}{12}$

Answer: D

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4. During a certain period, the cost of living index number goes from 110 to 200 and the salary of a worker is also raised from Rs. 325 to Rs. 500. So the worker actually.....in real term.

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5. Calculate the cost of living index for the following data :

Commodity	A	B	C	D
PR	248	133.30	204	138.50
Weight	22	48	17	13

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6. Calculate the coefficient of correlation between x and y series from the following data :

$$\sum_{i=1}^{12}(x_i-\bar{x})^2=360,\ \sum_{i=1}^{12}(y_i-\bar{y})^2=250 \text{ and } \sum_{i=1}^{12}(x_i-\bar{x})(y_i-\bar{y})=225$$

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7. Calculate Cov(x, y), given

$\sum x_i = 50, \sum y_i = -30, \sum x_i y_i = 50, n = 5.$

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8. Find the mode from the following frequency distribution :

Output (in Units)	$300-309$	$310-319$	$320-329$	$330-339$	$340-$
No. of workers	9	20	24	38	48

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9. The scores on a reading comprehension test of 1000 students are given below :

Score (out of 75)	$0-5$	$5-10$	$10-15$	$15-20$	$20-25$	$25-30$	30
Frequency	6	12	50	120	225	250	18

Find the median score.

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10. Obtain the five-year moving averages for the following series of observations :

Year	2007	2008	2009	2010	2011	2012	2013	2014
Annual sales (Rs. '000)	3.6	4.3	4.3	3.4	4.4	5.4	3.4	2.4

Display these and the original figures on the same graph.

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