

NKL

THIRD REVISION TEST - 2023

10 Std

Reg No.

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Time: 3.00 Hrs

MATHEMATICS

Marks : 100

PART - I

Namakkal

14 X 1 = 14

Choose the Correct answer.

- If $n(A \times B) = 6$ and $A = \{1, 3\}$ then $n(B)$ is
a) 1 b) 2 c) 3 d) 6
- If $f: A \rightarrow B$ is a bijective function and if $n(B) = 7$ then $n(A)$ is equal to
a) 7 b) 49 c) 1 d) 14
- If the HCF of 65 and 117 is expressible in the form of $65m - 117$ then the value of m is
a) 4 b) 2 c) 1 d) 3
- If 6 times of 6th term of an A.P is equal to 7 times the 7th term, then the 13th term of the A.P is
a) 0 b) 6 c) 7 d) 13
- If $(x-6)$ is the HCF of $x^2 - 2x - 24$ and $x^2 - Kx - 6$ then the value of k is a) 3 b) 5 c) 6 d) 8
- Transpose of a column matrix is
a) unit matrix b) rectangular matrix c) square matrix d) row matrix
- If in ΔABC , $DE \parallel BC$. $AB = 3.6$ cm, $AC = 2.4$ cm, and $AD = 2.1$ cm, then the length of the side AC is
a) 1.4 cm b) 1.8 cm c) 1.2 cm d) 1.05 cm
- The slope of the line which is perpendicular to a line joining the points $(0,0)$ and $(-8, 8)$ is
a) -1 b) 1 c) $1/3$ d) -8
- The equation of a line passing through the origin and perpendicular to the line $7x - 3y + 4 = 0$
a) $7x - 3y + 4 = 0$ b) $3x - 7y + 4 = 0$ c) $3x + 7y = 0$ d) $7x - 3y = 0$
- If $\sin \theta + \cos \theta = a$ and $\sec \theta + \operatorname{cosec} \theta = b$ then the value of $b(a^2 - 1)$ is equal to
a) $2a$ b) $3a$ c) 0 d) $2ab$
- The curved surface area of a right circular cone of height 15cm, and base diameter 16cm is
a) $60\pi \text{ cm}^2$ b) $68\pi \text{ cm}^2$ c) $120\pi \text{ cm}^2$ d) $136\pi \text{ cm}^2$
- A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r_2 units. Then $r_1 : r_2$
a) 2 : 1 b) 1 : 2 c) 4 : 1 d) 1 : 4
- The range of the data 8, 8, 8, 8 is a) 0 b) 1 c) 8 d) 3
- The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is
a) 2 b) 1 c) 3 d) 1.5

PART - II

Note : Answer any 10 questions (Q.No.28 is compulsory)

10 X 2 = 20

15. A Relation R is given by the set $\{(x, y) / y = x + 3, x \in \{0, 1, 2, 3, 4, 5\}\}$. Determine its domain and range. *(1, 2) 3 (PN-10)*

16. Find K if $f(k) = 5$ where $f(k) = 2k - 1$. *(2, 2) (PN-27)*

17. Solve $5x \equiv 4 \pmod{6}$ *(2, 3) 3 (PN-51)*

18. Find the sum $3 + 1 + \frac{1}{3} + \dots + \infty$. *(2, 9) (74)*

19. Find the excluded value of $\frac{1}{t^2 - 5t + 6}$ *(2, 2) (11) (PN-99)*

20. If A is of order $p \times q$ and B is of order $q \times r$ what is the order of AB and BA? *(2, 1) 2 (PN-153)*

21. A man goes 18m due east and then 24 m due north. Find the distance of his current position from the starting point? *(4, 1) (PN-187)*

10th - Maths -NKL- பக்கம்-1

22. The line through the points (-2, a) and (9,3) has slope $-\frac{1}{2}$ Find the value of a (Eg - 5.2) 7 (PN - 220)
23. Prove that $\frac{1+\cos\theta}{1-\cos\theta} = \operatorname{cosec}\theta + \cot\theta$. (Eg 6.5) (PN - 245)
24. If the total surface area of a cone of radius 7 cm is 704 cm^2 , then find its slant height (Eg, 7.6) (PN - 275)
25. If the ratio of radii of two spheres is 4 : 7, find the ratio of their volumes (7.2) 7 (PN - 290)
26. Find the standard deviation of first 21 natural numbers (8.1) 7 (PN - 313)
27. If $P(A)=0.37$, $P(B)=0.42$, $P(A \cap B)=0.09$, find $P(A \cup B)$ (Eg 8.26) (PN - 327)
28. Determine the nature of the roots of the equation $\sqrt{2}x^2 - 3x + 3\sqrt{2} = 0$.

PART - III (3, 3) (PN - 119)

10 X 5 = 50

Note : Answer any 10 Questions (Q.No.42 is compulsory).

29. Given $A = \{1, 2, 3\}$, $B = \{1, 2, 3\}$, $C = \{3, 4\}$ and $D = \{1, 3, 5\}$ $(A \cap C) \times (B \cap D) = (A \times B) \cap (C \times D)$
30. Let $f : A \rightarrow B$ be a function defined by $f(x) = \frac{x}{2} - 1$ where $A = \{2, 4, 6, 10, 12\}$
 $B = \{0, 1, 2, 4, 5, 9\}$ Represent f by
 i) set of ordered pairs ii) a table iii) an arrow diagram iv) a graph
31. The sum of first n , $2n$ and $3n$ terms of an A.P are S_1 , S_2 and S_3 respectively. Prove that $S_3 = 3(S_2 - S_1)$
32. Find the sum to n terms of the series $7 + 77 + 777 + \dots$
33. Find the square root of $64x^4 - 16x^3 + 17x^2 - 2x + 1$
34. If $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ and $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ show that $A^2 - (a+d)A = (bc - ad)I_2$.
35. State and prove pythagoras Theorem.
36. Find the area of the quadrilateral formed by the points (-9,0), (-8, 6), (-1,-2) and (-6,-3)
37. If $\operatorname{cosec}\theta + \cos\theta = p$ then prove that $\cos\theta = \frac{p^2 - 1}{p^2 + 1}$
38. The outer and the inner surface area of a spherical copper shell are $576 \pi \text{ cm}^2$ and $324 \pi \text{ cm}^2$ respectively Find the volume of the material required to make the shell.
39. A Solid right circular cone of diameter 14 cm and height 8 cm is melted to form a hollow sphere. If the external diameter of the sphere is 10cm, find the inner diameter
40. Find the coefficient of variation of 24, 26, 33, 37, 29, 31.
41. Two dice are rolled together. Find the probability of getting a doublet or sum of faces as 4.
42. Find the equation of a straight line passing through the point P (-5,2) and parallel to the line joining the points Q (3,-2) and R(-5,4)

PART - IV

2X8=16

Note : Answer all the questions.

43. Take a point which is 11 cm away from the centre of a circle of radius 4cm and draw the two tangents to the circle from that point (OR)
 Construct a triangle ΔPQR such that $QR=5\text{cm}$, $\angle P=30^\circ$ and the altitude from P to QR is of length 4.2 cm
44. Draw the graph of $y=x^2+x-2$ and hence solve $x^2+x-2=0$ (OR)
 Draw the graph of $xy=24$, $xy>0$ Using the graph find
 i) y when $x=3$ and ii) x when $y=6$

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Namakkal

THIRD REVISION TEST, MARCH - 2020

STANDARD - X

Time : 3.00 hrs

MATHS

Marks: 100

Part - I

14×1=14

Note: i) Answer all the 14 questions.

ii) Choose the most suitable answer from the given four alternatives and write the option code with the corresponding answer.

1) If the ordered pairs $(a+2, 4)$ and $(5, 2a+b)$ are equal then (a, b) is
 a) $(2, -2)$ b) $(5, 1)$ c) $(2, 3)$ d) $(3, -2)$

2) If $f: A \rightarrow B$ is a bijective function and if $n(B)=7$, then $n(A)$ is equal to
 a) 7 b) 49 c) 1 d) 14

3) Given $F_1=1$, $F_2=3$ and $F_n=F_{n-1}+F_{n-2}$ then F_5 is
 a) 3 b) 5 c) 8 d) 11

4) The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \dots$ is

a) $\frac{1}{24}$ b) $\frac{1}{27}$ c) $\frac{2}{3}$ d) $\frac{1}{81}$

5) $y^2 + \frac{1}{y^2}$ is not equal to

a) $\frac{y^4+1}{y^2}$ b) $(y+\frac{1}{y})^2$ c) $(y-\frac{1}{y})^2+2$ d) $(y+\frac{1}{y})^2-2$

6) For the given matrix $A = \begin{pmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 9 & 11 & 13 & 15 \end{pmatrix}$ then order of the matrix $(AT)^T$ is

a) 2×3 b) 3×2 c) 3×4 d) 4×3

7) A tangent is perpendicular to the radius at the

a) centre b) point of contact c) infinity d) chord

8) If $(5, 7)$, $(3, P)$ and $(6, 6)$ are collinear then the value of P is

a) 3 b) 6 c) 9 d) 12

9) $(2, 1)$ is the point of intersection of two lines

a) $x-y-3=0$; $3x-y-7=0$ b) $x+y=3$; $3x+y=7$
 c) $3x+y=3$; $x+y=7$ d) $x+3y-3=0$; $x-y-7=0$

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2 X - Maths

- 10) If $x = a \tan \theta$ and $y = b \sec \theta$ then
 a) $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$ b) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ c) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ d) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$
- 11) The height of a right circular cone whose radius is 5cm and slant height is 13cm will be
 a) 12cm b) 10cm c) 13cm d) 5cm
- 12) The total surface area of a hemi-sphere is how much times the square of its radius
 a) π b) 4π c) 3π d) 2π
- 13) If the standard deviation of x, y, z is P then the standard deviation of $3x+5, 3y+5, 3z+5$ is
 a) $3P+5$ b) $3P$ c) $P+5$ d) $9P+15$
- 14) If a letter is chosen at random from the English alphabets $\{a, b, \dots, z\}$ then the probability that the letter chosen precedes x
 a) $\frac{12}{13}$ b) $\frac{1}{13}$ c) $\frac{23}{26}$ d) $\frac{3}{26}$

Part - II

Answer Ten questions. Question No. 28 is compulsory.

 $10 \times 2 = 20$

- 15) $B \times A = \{(-2,3), (-2,4), (0,3), (0,4), (3,3), (3,4)\}$ Find A and B.
- 16) $f(x) = 2x+1$ and $g(x) = x^2-2$ find fog and gof
- 17) 'a' and 'b' are two positive integers such that $a^b \times b^a = 800$ find 'a' and 'b'. (2, 9)
- 18) If $1^3+2^3+3^3+\dots+k^3=44100$ then find $1+2+3+\dots+k$ (2, 9)
- 19) Find the square root of $\frac{400x^4y^{12}z^{16}}{100x^8y^4z^4}$
- 20) Define Diagonal matrix.
- 21) State menelaus theorem.
- 22) Find the equation of a line passing through the points (3, -4) and having slope $\frac{-5}{7}$ Eg. 5.21 (PN 224)
- 23) Find the slope of the straight line $5y-3=0$ (3, 4) (PN 235)
- 24) Find the angle of elevation of the top of a tower from a point on the ground, which is 30M away from the foot of a tower of height $10\sqrt{3}$ M. (6, 2) (PN 257)
- 25) The volume of a solid right circular cone is 11088cm^3 . If its height is 24cm then find the radius of the cone. Eg. 7.19 (PN 285)



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3 X - Maths

26) i) Volume of a hollow cylinder = $\pi h (R^2 - r^2)$ cu units

ii) Volume of a sphere = $\frac{4}{3} \pi r^3$ cu units

(8.1) 27) Find the standard deviation of first 21 natural numbers. (7.5) 8.1.15

(PN-313) 28) Two unbiased dice are rolled once. Find the probability of getting a doublet.

Part - III (Eg. 8.28) (PN 321)

Answer 10 questions. Question No. 42 is compulsory: 10x5=50

29) Let $A = \{1, 2, 3, 4\}$ and $B = \{2, 5, 8, 11, 14\}$ be two sets. Let $f: A \rightarrow B$ be a function given by $f(x) = 3x - 1$. Represent this function i) by arrow diagram ii) in a table form iii), as a set of ordered pairs iv) in a graphical form. [Eg 1.11] [PN 16]

30) A function $f: [-5, 9] \rightarrow \mathbb{R}$ is defined as follows

$$f(x) = \begin{cases} 6x+1 & \text{if } -5 \leq x < 2 \\ 5x^2-1, & \text{if } 2 \leq x < 6, \\ 3x-4 & \text{if } 6 \leq x \leq 9 \end{cases}$$

Find $\frac{2f(-2) - f(6)}{f(4) + f(-2)}$ [Eg 1.4] (PN 25)

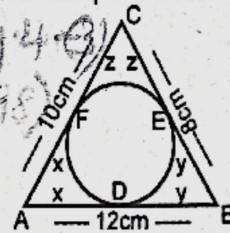
31) If $P_1^{x_1} \times P_2^{x_2} \times P_3^{x_3} \times P_4^{x_4} = 113400$ where P_1, P_2, P_3, P_4 are primes in ascending order and x_1, x_2, x_3, x_4 are integers. Find the value of P_1, P_2, P_3, P_4 and x_1, x_2, x_3, x_4 . (Ex 2.2) 5 (PN 46)

32) Find the sum of all natural numbers between 300 and 600 which divisible by 7. [Eg 2.36] (PN 65)

33) Solve: $x+y+z=5; 2x-y+z=9; x-2y+3z=16$ (3.1) 1 (PN 92)

34) The hypotenuse of a right angled triangle is 25cm and its perimeter 56cm. Find the length of the smallest side. (3.12) 9

35) A circle is inscribed in ΔABC having sides 8cm, 10cm, 12cm as shown in figure, Find AD, BE and CF.



36) Find the area of the quadrilateral formed by the points (8, 6), (5, 11), (-5, 12) and (-4, 3). [Eg 5.9] (PN 209)

37) Find the equation of a line passing through (6, -2) and perpendicular to the line joining the points (6, 7) and (2, -3). [Eg 3.4] (PN 235)

38) If $\frac{\cos \alpha}{\cos \beta} = m$ and $\frac{\cos \alpha}{\sin \beta} = n$, then prove that $(m^2 + n^2) \cos^2 \beta = n^2$. (6.1)

(PN 250)

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4 X - Maths

- 39) If the radii of the circular ends of a frustum which is 45cm height are 28cm and 7cm find the volume of the frustum. [Eq 7.23] (PN 289)
- 40) A solid right circular cone of diameter 14cm and height 8cm is melted to form a hollow sphere. If the external diameter of the sphere is 10cm. Find the internal diameter. [Ex 7.4] 4 (PN 297)
- 41) In a class of 50 students, 28 opted for NCC, 30 opted for NSS and 18 opted both NCC and NSS. One of the students is selected at random. Find the probability that (Eq 8.31) (PN-328)
- The student opted for NCC but not NSS
 - The student opted for NSS but not NCC
 - The student opted for exactly one of them.

42) $A = \begin{pmatrix} -2 \\ 4 \\ 5 \end{pmatrix}$ and $B = (1 \ 3 \ -6)$ show that $(AB)^T = B^T A^T$ (Create)

Part - IV

Answer both questions:-

- 43) Draw a triangle of radius 3cm. Take a point P on this circle and draw a tangent at P. 2×8=16

Construct a ΔPQR which the base $PQ=4.5\text{cm}$, $\angle R=35^\circ$ and the median from R to RG is 6cm. [or]

- 44) Discuss the nature of the solutions of the following quadratic equations $x^2-8x+16=0$

Draw the graph of $y=x^2-5x-6$ and hence solve $x^2-5x-14=0$ [or]

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