Roll No. _____ NLCS/10/Mathematics Std.(041)/45

Pre Board Exam 2025 – 2026

Time Allowed : 3 : 00 Hrs. **M M :** 80

General Instructions:

This Question paper contains 38 questions. All questions are compulsory.

1. This Question paper is divided into five Sections - A, B, C, D and E.
2. In Section A, Questions no. 1 to 18 are multiple choice questions (MCQs) and Questions no. 19 nd 20 are Assertion - Reason based questions of 1 mark each.
3. In Section B, Questions no. 21 to 25 are Very Short Answer (VSA) - type questions, carrying 2 marks each
4. In Section C, Questions no. 26 to 31 are Short Answer (SA) - type questions, carrying 3 marks each
5. In Section D, Questions no. 32 to 35 are Long Answer (LA) - type questions, carrying 5 marks each.
6. In Section E, Questions no. 36 to 38 are Case study - based questions, carrying 4 marks each.
7. There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Section C, 2 questions in Section D and one subpart each in 2 questions of Section E.
8. Use of calculators is not allowed.

Section-A

Q.1 HCF of co-prime numbers is always
(a) 0 (b) 1 (c) largest number (d) product of all numbers

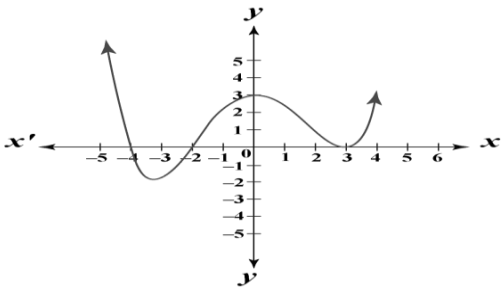
Q.2 The number of polynomials having zeros -3 and 4 is
(a)only one (b)exactly two (c)infinite (d)at most two

Q.3 A pair of linear equations of two variables has unique solution. What type of lines will its graph represent?
(a) parallel (b) intersecting (c) co – incident (d) perpendicular

Q.4 The common difference of an AP whose nth term is given by $a_n=5n+3$
(a)5 (b)3 (c)-5 (d)4

Q.5 A quadratic equation whose roots are $3+\sqrt{3}$ and $3-\sqrt{3}$ is
(a)x^2-6x+3 (b)x^2-6x+6 (c)x^2-3x+6 (d)x^2-3x+3

Q.6 If $\Delta ABC \sim \Delta DEF$ and $\angle A=45^0$, $\angle C=55^0$, then the value of $\angle E$ is:
(a) 45^0 (b) 75^0 (c) 55^0 (d) 80^0



Q.7 The number of zeroes of the polynomial shown in the below graph is :
(a) 1 (b) 2 (c) 4 (d) 3

Q.8 If cosec $\theta = \frac{3}{2}$, then $4(\text{cosec}^2\theta + \cot^2\theta)$ is equal to :
(a) 18 (b) 10 (c) 14 (d) 16

Q.9 A pendulum swings through an angle of 30^0 and describes an arc 17.6 cm in length. The length of pendulum is:
(a) 26.2 cm (b) 33.6 cm n(c) 28.5 cm (d) 32.4 cm

Q.10 The 11^{th} term of an AP 10, 7,4…….-62 from the end is
(a)25 (b)30 (c)-32 (d)35

Q.11 A bag contains 6 red balls and 5 blue balls. One ball is drawn at random. The probability of getting a blue ball is:
(a)$\frac{6}{11}$ (b) $\frac{5}{11}$ (c) $\frac{5}{6}$ (d)$\frac{6}{5}$

Q.12 The median of the given data with the observations in ascending order is 27.5.The value of x is 24, 25, 26, x+2, x+3, 30, 33, 37

(a) 25 (b) 25.5 (c) 27 (d) 27.5

Q.13 A surveyor wants to find out the height of a tower. He measures ∠A as $\tan A = \frac{3}{4}$ .What is the height of the tower if A is 40 m from its base.

(a) 20m (b) 10m (c) 30m (d) 40m

Q.14 Find the distance of 10(sin A, cos A) from the origin

(a)10 (b)8 (c)6 (d)14

Q.15 Given that sin θ = $\frac{a}{b}$ then cos θ is equal to

(a) $\frac{b}{\sqrt{b^2-a^2}}$ (b) $\frac{b}{a}$ (c) $\frac{\sqrt{b^2-a^2}}{b}$ (d) $\frac{a}{\sqrt{b^2-a^2}}$

Q.16 If α and β are the zeroes of the polynomial p(x) = $x^2 - ax - b$, then the value of $\alpha^2 + \beta^2$ is:

(a) $a^2 - 2b$ (b) $a^2 + 2b$ (c) $b^2 - 2a$ (d) $b^2 + 2a$

Q.17 What is the value of sin 60° cos 30° + sin 30° cos 60°

(a)0 (b)1 (c)-1 (d)4

Q.18 A card is drawn from a well-shuffled deck of 52 playing cards. The probability that the card will be an black ace is

(a)$\frac{1}{52}$ (b)$\frac{1}{26}$ (c)$\frac{2}{26}$ (d)$\frac{2}{13}$

In questions no. 19 and 20 statement of Assertion (A) is follow by statement of Reason (R). Choose the correct answer of these questions from the four options (a),(b),(c) and (d) given below :

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the assertion (A).

(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of the assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true

Q.19 **Assertion (A) :** a,b,c are in AP if and only if 2b =a+ c

Reason (R) : The sum of first n odd natural numbers is n^2.

Q.20 **Assertion (A)** : If the points A(4,3) and B(x,5) lie on a circle with centre O(2,3) then the value of x is 2.

Reason (R) : The centre of a circle is the mid-point of each chord of the circle.

Section-B

Q.21 Find the area of a sector of a circle with the radius 6 cm if angle of the sector is 60^0 .

OR

The minute hand of a clock is 12 cm long. Find the area of the face of the clock described by the minute hand in 35 minutes.

Q.22 Find the largest number that will divide 398, 436 and 542 leaving remainders 7, 11, and 15 respectively.

Q.23 If acosθ + bsinθ=m and asinθ−bcosθ=n, then what is the value of a^2+b^2?

OR

If a and b are acute angles such that sin(a-b)=0 and 2cos(a+b)-1=0 , then find values of angles a and b.

Q.24 Find the ratio in which the y−axis divides the line segment joining the points (5,−6) and (−1,−4). Also find the point of intersection.

Q.25 Find the value of m for which the quadratic equation

(m -1) x^2 + 2 (m- 1)x + 1 = 0 has two real and equal roots.

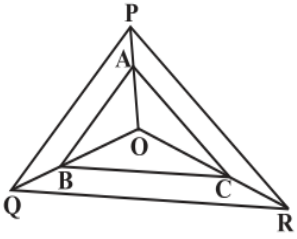
Section-C

Q.26 Prove that $\sqrt{5}$ is an irrational number.

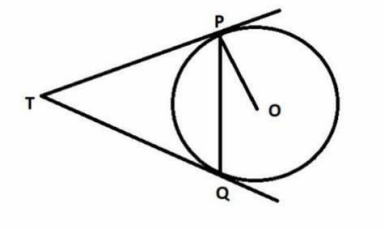
Q.27 State and Prove Basic Proportionality theorem.

OR

In given figure, A, B and C are points on OP, OQ and OR respectively such that AB || PQ and AC || PR. Show that BC || QR.



Q.28 In figure, two tangents TP and TQ are drawn to a circle with centre O from an external point P. Prove that ∠PTQ=2 ∠OPQ.



Q.29 Which term of the AP: 23, 21, 19,.....is first negative term?

Q.30 The sum of the digits of a two-digit number is 9. Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number.

Q.31 Three different coins are tossed together. Find the probability of getting

(i)exactly two heads (ii) at least two heads (iii) at most two tails.

OR

Red queen and a black jack are removed from a pack of 52 playing cards. Find the probability that the card drawn from the remaining cards is:

(i) a red card (ii) neither a jack nor a king (iii) either a king or a queen.

Section-D

Q.32 A man standing on the deck of a ship, which is 10 m above water level, observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of hill as 30°. Find the distance of the hill from the ship and the height of the hill.

OR

The angles of depression of the top and bottom of a 50 m high building from the top of a tower are 45° and 60° respectively. Find the height of the tower and the horizontal distance between the tower and the building, (use $\sqrt{3}$ = 1.73)

Q.33 A student, was asked to make a model shaped like a cylinder with two cones attached at its two ends by using a thin aluminum sheet. The diameter of the model is 3 cm and its length is 12 cm. If each cone has a height of 2 cm, find the volume of air contained in the model .

OR

A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of hemisphere is 3.5 cm and the total wood used in the making of toy is $166\frac{5}{6}$ cm³. Find the height of the toy. Also, find the cost of painting the hemispherical part of the toy at the rate of ₹10 per cm².

Q.34 A horse is tied to a peg at one corner of a square shaped grass field of side 15 m by means of a 5 m long rope. Find

(i) the area of that part of the field in which the horse can graze.

ii) The increase in the grazing area if the rope were 10 m long instead of 5 m. (Use π=3.14)

Q.35 If the total number. of students are 40, then find x and then find median and mean of the given data.

Class Total	0 – 10	10 – 2 0	20 –30	30 –40	40 –50	50 –60	60 – 70	Total
Frequency	X	5	9	12	6	3	2	40

Section-E

Q.36 Currency is a medium of exchange for goods and services. Ashok made a payment to shopkeeper, for the article he purchased, in the denomination of ₹500 and ₹ 20. He paid ₹ 2640 to the shopkeeper. If all the denomination of ₹ 500 is to be changed by ₹ 100 then the boy could have paid ₹ 640 only. Assume the number of currency notes of ₹ 500 as 'f' and the number of currency notes of ₹ 20 as 'g'



Based on the above information, answer the following questions:

(i) Write a linear equation representing the amount paid by Ashok.

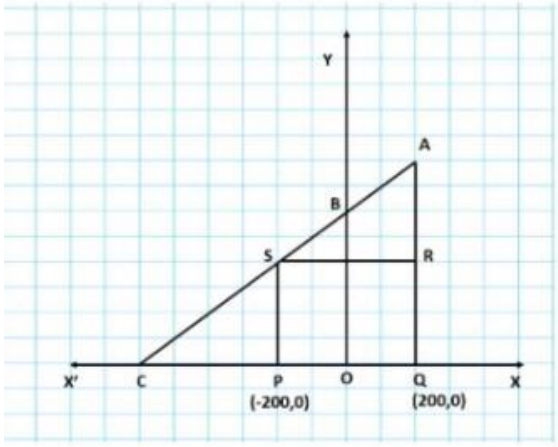
(ii) If Ashok had to pay ₹ 2800 to the shopkeeper, how many ₹20 notes did he need?

(iii) How many total currency notes did Ashok gave to shopkeeper?

OR

Draw the graph of linear equation representing the amount paid by Ashok

Q.37 Jagdish has a field which is in the shape of a right angled triangle AQC. He wants to leave a space in the form of a square PQRS inside the field for growing wheat and the remaining for growing vegetables (as shown in the figure). In the field, there is a pole marked as O.



Based on the above information, answer the following questions :

(i) Taking O as origin, coordinates of P are (-200, 0) and of Q are (200, 0). PQRS being a square, what are the coordinates of R and S?

(ii) (a) What is the area of square PQRS ?

OR

(b) What is the length of diagonal PR in square PQRS?

(iii) If S divides CA in the ratio K:1, what is the value of K, where point A is (200, 800) ?

Q.38 An engineer is planning to make all the Pillars of the Metro green with plants to make these beautiful and to contribute for healthy environment as shown in the picture. Observe the picture and answer the questions if dimension of one pillar is 1.5 m X 1.5 m X 20 m



Based on the above information, answer the following questions:

(i) What is the shape of the pillars?

(ii) How much cement is used to fill the pillar?

(iii) Find the lateral surface area of one pillar.

OR

Find the total surface area of one pillar

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