

SAMPLE PAPER – 2009
CLASS – IX
SUBJECT – MATHEMATICS

NMTC Q.P.1

SECTION-A

- 1) Express $1.6\overline{}$ as a rational number in the form p/q . (5/3)
- 2) Find the value of $(512)^{-2/9}$ (1/4)
- 3) Find the remainder when $4x^3 - 3x^2 + 2x - 4$ is divided by $x+2$. (-52)
- 4) Find $(p-9)(p+2)$ ($p^2 - 7p - 18$)
- 5) In which quadrant do $(-2, 4)$ and $(3, -1)$ lie?
- 6) What angle is equal to its supplement? (90)
- 7) O is the centre of a circle and AB is a chord. P is a point on the major segment. If $\angle AOB = 110^\circ$ find $\angle APB$. (55°)
- 8) The perimeter of a triangle is 36cm and its sides are in the ratio 3:4:5. Find its area. (54sq.cm)
- 9) Find the volume of a right circular cylinder which has a height of 21cm and base radius 5cm. (1650)
- 10) Calculate the mean of all possible factors of 10. (4.5)

SECTION-B

- 11) The arithmetic mean of 100 observations is 24. 6 is added to each of the observation and then each of them is multiplied by 2.5. Find the new A.M. (75)
- 12) A right triangle with its sides 5cm, 12cm, and 13cm is rotated about the side 12cm. Find the volume of the solid so generated. (314.28cc)
- 13) The lengths of the sides of a triangle are 10cm, 24 cm and 26cm. Find the length of the perpendicular from the opposite vertex to the side whose length is 26cm. (9.23cm)
- 14) ABCD is a cyclic quadrilateral. If AC bisects both angles A and C prove that $\angle ABC = 90^\circ$.
- 15) AD is one of the medians of $\triangle ABC$. X is any point on AD. Show that $\ar(\triangle ABX) = \ar(\triangle ACX)$.

SECTION-C

16) Two coins are tossed simultaneously by 300 times, and we get two heads 135 times, one head 63 times, no head 102 times. Find the probability of occurrence of each of these events. (.45, .21, .34)

17) The average height of 30 students is 150cm. It was detected later that one value 165 was wrongly copied as 135cm for computation of mean. Find the correct mean. (151cm)

18) Lead spheres of 6cm diameter are dropped into a cylindrical beaker containing some water and are fully submerged. If the diameter of the beaker is 18cm and water rises by 40cm find the number of spheres dropped in the water. (90)

19) A park in the shape of a quadrilateral ABCD has $\angle C = 90^\circ$. $AB = 18\text{cm}$, $BC = 24\text{cm}$, $CD = 10\text{cm}$ and $AD = 16\text{cm}$. How much area does it occupy? (262sq.m)

20) If the non parallel sides of a trapezium are equal prove that it is cyclic.

21) D is the midpoint of side BC of $\triangle ABC$ and E is the mid point of BD. If O is the midpoint of AE then prove that area ($\triangle BOE$) = $\frac{1}{8}$ area ($\triangle ABC$)

22) A rectangle and a parallelogram have common base and equal areas. Show that the perimeter of rectangle is smaller than perimeter of the parallelogram.

23) The angles of a quadrilateral are in the ratio 3:5:9:13. Find all angles of the quadrilateral. (36, 60, 108, 156)

24) ABCD is a rhombus and P, Q, R, S are mid-points of AB, BC, CD and DA respectively. Show that PQRS is a rectangle.

25) Simplify : a) $(2x+p-c)^2 - (2x-p+c)^2$ (8xp-8xc)
b) $(4x+2y)^3 + (4x-2y)^3$ ($128x^3 + 96xy^2$)

SECTION-D

26) Construct a square root spiral by marking $\sqrt{2}$ to $\sqrt{10}$ on same number line.

27) Prove that sum of 3 angles of a triangle is 180° . Using this result find the 3 angles of a triangle which is given by $(2x-7)^\circ$, $(x+25)^\circ$, $(3x+12)^\circ$. (43, 50, 87)

28) Construct a triangle XYZ in which $\angle Y = 30^\circ$, $\angle Z = 90^\circ$, $XY + YZ + ZX = 11\text{cm}$.

29) Salam has built a cubical water tank with lid for his house with each outer edge 1.5m long. He gets the outer surface of the tank excluding the base covered with square tiles of side 25cm. Find how much he would spend for tiles if the cost of the tiles is Rs.360 per dozen. (Rs5400)

30) Construct a frequency polygon for the following data.

Class interval	0-10	10-20	20-30	30-40	40-50
Frequency	85	40	45	25	5