RISE OF NATION ACADEMY
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Test Paper

Standard – X

Subject –Mathematics
Topic – Full Course

Date – 03/02/2019   Time – 03:00 hrs.
Max. Marks - 80   **Min. Marks**

SECTION-A

1. If $7x = cosecA, \frac{7}{x} = cotA$ find $x^2 - \frac{1}{x^2}$.

2. After how many decimal places decimal representation $\frac{81}{125000}$ of will end.

OR

H.C.F of two numbers is 32 and their L.C.M is 192. If one number is 96, find the other.

3. If - 6 is a zero of $x^2 - kx - 90.$ find value of 'k'.

OR

For what value of 'k' the equation $25x^2 - kx + k = 0$ will have equal roots?

4. Find the distance between the points A(2,-3) and B(2,4)

5. Find the length of the tangent drawn to a circle of radius 7 cm from a point 25 cm away from the centre.

6. Show that the equation $2x^2$ is not true for any real value of 'x'.

SECTION-B

7. Three coins are tossed together. Find the probability of getting (i) at least one head, (ii) utmost two heads.

8. From a pack of well shuffled cards one card is drawn at random. Find the probability that the drawn card is (i) a face card (ii) not a king or queen

9. Find the sum of all odd numbers between 1 and 50

OR

Which term of the A.P.62, 58. 54,…… is the first negative term?

10. Prove that √2 is irrational

OR

If 'x' and 'y' are two odd positive integers show that $x_2 + y_2$ is even but not divisible by 4.

11. Find co-ordinates of the midpoint of the line joining A(-4,4) and B(- 6,- 1)

12. If α and β are zeroes of $x^2 - 5x + 3$, find the value of $\frac{1}{\alpha} - \frac{1}{\beta} - 2\alpha\beta$.

SECTION-C

13. If the zeroes of the polynomial $64x^3 - 144x^2 + 92x - 15$ are in A.P find the zeroes.

14. Find the area of ΔABC whose vertices are A (-5,7), B (-4,-5) and C(-1,-3)

OR

Vertices of a ΔABC are (-2, 3), (6, k) and (4, 7). If its area is 19 square units find 'k'.

15. Prove that square of every positive number is of the form 3m or 3m+1 for some integer 'm'.

OR

In a seminar there are 24 Science, 36 English and 48 Mathematics teachers. Find the number of rooms required to accommodate them such that teachers of the same subject stay together.

16. Construct a ΔABC with AB = 4.2 cm, BC = 3 cm and AC = 5 cm and then construct ΔA'BC' similar to it with scale factor 4/3

17. If the mean of the following data is 39, find the missing frequency.

C.I	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Freq.	8	5	15	9	10	X	12

18. AB and CD are two perpendicular diameters of a circle of radius 7 cm and whose centre is 'O'. AC and BC are joined. Using OD as diameter a smaller circle is drawn. Find the area of the smaller circle and the minor segments formed by chords AC and BC.

19. A racing track has a horizontal part with semi-circular ends. If the width of the track is 7 m and inner radius of semi-circular part is 35 m and horizontal part is 14 m long find the cost of levelling the track at Rs.12/m2.

20. In a ΔPQR, PD ⊥ QR such that D lies on QR. If PQ = a, PR = b, QD = c and DR = d prove that *(a+b) (a- b) = (c+d) (c-d)*

OR

Two poles of height 'x' and 'y' metres stand vertically on either side of a street opposite to each other. If the height at the intersection of the ropes tied from top of one pole to foot of the other is 'z' meters prove
$\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$.

21. If $a^2 sec^2\theta - b^2 tan^2\theta = c^2$, prove that $sin^2\theta = \frac{c^2 - a^2}{c^2 - b^2}$.

22. Find the zeroes of the polynomial 3√2 x^2 + 13x + 6√2 and verify the relationship with the coefficients of the polynomial.

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OR

Solve for x: $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$

SECTION-D

23. A person was appointed to count Rs.2830. During the first 15 minutes he counted at a uniform rate of Rs.100/minute and there after he counted Rs.3 less each minute than the previous minute. Find the time taken to count the money.

OR

Find the sum of all 3-digit numbers that leave remainder 2 when divided by 7.

24. PQ is a chord of length 8 cm in a circle of radius 5 cm. Tangents at P and Q intersect at T. Find the length of PT.

OR

TA and TB are tangents to circle with centre 'O' from an exterior point T. OT intersects the circle at P. Prove AP bisects ∟TAB.

25. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre.

OR

ABC is a right triangle right angled at B. D and E are points on BC such that BD =DE=EC Prove that $8AE^2 = 3AC^2 + 5AD^2$

26. A person goes 600 km to his home partly by train and partly by car. If he goes 200 km by train, rest by car he would reach in 7 hours. But if he covers 300 km by car, rest by train he would reach 15 minutes earlier. Find the speeds of train and car.

27. Angle of elevation of a jet flying horizontally from a point on the ground was found to be 60°. After a flight of 20 seconds the angle of elevation changes to 30°. Find the speed of the jet if it is flying at an altitude of 1500√3 metres.

28. A bucket is in the form of frustum of a cone of radii 12 cm and 21 cm. Find the curved surface area if the height of the bucket is 40 cm. Also find the cost of metal sheet used to make the bucket at Rs. 8/cm$_2$

29. The median of the following data is 27. Find the missing frequencies.

C.I	0-10	10-20	20-30	30-40	40-50	50-60	TOTAL
Freq.	5	X	20	14	Y	8	68

30. Water flows in a pipe of inner radius 3.5 cm at the rate of 10km/h. Find the level of water in a cylindrical tank of diameter 3.5 m, if water flows into it for 45 minutes.

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