NAIR COACHING ACADEMY

Class: 10 *Test Series : Paper 1* *Date: 2/9/12*

Time: 180 min *Mathematics* *Marks: 90*

SECTION A {8 marks}

1. The decimal expansion of π

   (a) is terminating (b) is non-terminating and recurring

   (c) is non-terminating and non-recurring (d) does not exist

2. Which one is not polynomial?

   (a) $x^3 - 3x^2 + x + 1$ (b) $\sqrt{5}x^2 + x + 1$ (c) $8x^{-2} + x + 1$ (d) All are polynomial

3. If HCF (26, 91) = 13, then their LCM is:

   (a) 192 (b) 182 (c) 162 (d) 172

4. The graph of y = – 9 is a line parallel to

   (a) *x*-axis (b) y-axis (c) both *x* and y axes (d) none of these

5. Δ ABC ~ Δ DEF; ∠ A = 47°, ∠ E = 83°, then ∠ C is equal to

   (a) 70° (b) 80° (c) 50° (d) 40°

6. If sin A= $\frac{\sqrt{3}}{2}$, then the value of cot A

   (a) $\sqrt{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) 1 (d) 2

7. The value of P, if $\cos(81^\circ + \theta) = \sin(\frac{p}{3} - \theta)$.

   (a) 0 (b) 27 (c) 9 (d) 30

8. If mode = 80, mean = 110, then the median is (a) 90 (b) 100

   (c) 110 (d) 120

SECTION B {12 marks}

9. Find the zeroes of the quadratic polynomial $x^2 - 7x + 12$ and verify the relationship between the zeroes and its coefficients.

10. Use Euclid's division algorithm to find HCF of 210 and 55

11. Prove that the line drawn parallel to parallel sides of a trapezium divides the non-parallel sides proportionally. Or

11. In Δ ABC, AC = BC. If $AB^2 = 2AC^2$, prove that Δ ABC is a right triangle

12. If $\sin(A - B) = \frac{1}{2}$, $\cos(A + B) = \frac{1}{2}$, find A and B and $\cot(A + B)$

13. Find a quadratic polynomial whose one zero is 5 and product of zeroes is – 20.

14. Write the ordinary frequency table and cumulative frequency for the given data

Marks	Less than 30	″ 40	″ 50	″ 60	″ 70	″ 80	″ 90
No. of students	7	10	15	22	37	42	46

SECTION C {30 marks}

15. If $\tan A = 1/\sqrt{3}$, find the value of $\dfrac{\operatorname{cosec}^2 A - \sec^2 A}{\operatorname{cosec}^2 A + \sec^2 A}$

16. Sides AB and BC and median AD of Δ ABC are respectively proportional to sides PQ and QR and median PM of Δ PQR. Show that Δ ABC ~ Δ PQR Or

16. In Δ ABC, seg MN || side AC, seg MN divides Δ ABC into two parts equal in area. Find MB**:** AB

17. Evaluate: $\dfrac{\sec\theta \operatorname{cosec}(90-\theta) - \tan\theta \cot(90-\theta) + \sin^2 22 + \sin^2 68}{\tan 10 \tan 20 \tan 60 \tan 70 \tan 80 + \operatorname{cosec} 30}$

18. If the mean of given data is 50, find the value of A

Class Interval	0-20	20-40	40-60	60-80	80-100
Frequency	17	28	32	A	19

19. Prove that $\sqrt{5}$ is an irrational number Or

19. Find the largest possible positive integer that will divide 398, 436, and 542 leaving remainder 7, 11, 15 respectively.

20. The following table gives production yield per hectare of wheat of 100 farms of a village.

Production (kg/ hectare)	40-45	45-50	50-55	55-60	60-65	65-70
Farms	4	6	16	20	30	24

Change the distribution to a 'more than type' distribution and draw its ogive and find its median.

21.If A be the area of a right triangle and b one of the sides containing the right angle, prove that the length of the altitude on the hypotenuse is $\frac{2Ab}{\sqrt{b^4 + 4A^2}}$. Or

21. Prove that sum of squares of the sides of a rhombus is equal to the sum of squares of its diagonals

22. If the zeroes of $f(x) = x^3 - 3x^2 + x + 1$ are p – q, p, p + q, find values of p and q by factor theorem.

23.Solve: $\frac{33}{x+4} + \frac{12}{y-5} = 123$; $\frac{12}{x+4} + \frac{33}{y-5} = 102$

24. If α, β are zeroes of polynomial $2x^2 - 3x - 5$, form a polynomial whose zeroes are 2α + 1 and 2β + 1

SECTION D {40 marks}

25. State and prove Thales Theorem Or

25. Prove that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

26. Find the mean, median and mode of the given data

Income (Rs)	100-120	120-140	140-160	160-180	180-200
No. of workers	12	14	8	6	10

27. Find all zeroes of $4x^4 - 20x^3 + 23x^2 + 5x - 6$ if two of its zeroes are 2 and 3.

28. Find the vertices of the triangle formed by graphs of given equations:

$2y - x = 8$; $5y - x = 14$; $y - 2x = 1$ Or

28. In a cricket match between Pune and Mumbai teams the sum of one-third of the runs made by Pune team and one-fifth of the runs made by Mumbai team is 163. If Pune team made runs just sufficient to win the match, then how many runs are made by both teams separately?

29. Evaluate: $\frac{4\cos^2 60 + 5\sec^2 30 - \tan^2 60}{\sin 30 + \cos 30} + \cos 0 . \tan 30$

30. In an equilateral triangle ABC, D is a point on side BC such that 3BD = BC. Prove that $9AD^2 = 7AB^2$.

31.Find the mean wage of workers from given table by Step Deviation Method:

Wages (in Rs)	No. of Workers
More than 150	0
More than 140	10
More than 130	29
More than 120	60
More than 110	104
More than 100	134
More than 90	151
More than 80	160

32.Prove that $4\sqrt{5} - 5\sqrt{2}$ is irrational

33.BP and CQ are medians of Δ ABC right angled at A. Prove that $4 (BP^2 + CQ^2) = 5 BC^2$

34.(i) If $7\sin^2\theta+3\cos^2\theta = 4$, show that $\tan\theta = \frac{1}{\sqrt{3}}$

(ii) In Δ PQR, $\angle Q = 90^\circ$, PR + QR = 25 and PQ = 5. Find cos R, cot P

Life is like making tea. Boil your ego, Evaporate your fear, Dilute your shyness Filter your mistakes And get taste of Happiness and Success.

ALL THE BEST !

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