



Class: 10

Test Series : Paper 1

Date: 28/8/11

Time: 180 min

Mathematics

Marks: 80

SECTION A { 10 marks }

- The decimal expansion of $\frac{23}{2^3 \cdot 5}$ will terminate after _____ decimal place
(a) one (b) two (c) three (d) more than three
- If $\text{HCF}(16, n) = 8$ and $\text{LCM}(16, n) = 48$ then the value of n is
(a) 24 (b) 16 (c) 8 (d) 48
- A quadratic polynomial, whose zeroes are -3 and 4 , is
(a) $x^2 - x + 12$ (b) $x^2 + x - 12$ (c) $x^2 - x - 12$ (d) $x^2 + x + 12$
- If $x^5 + 2x^4 + x + 6$ is divided by $g(x)$ and quotient is $x^2 + 5x + 7$, then the possible degree of $g(x)$ is:
(a) less than 1 (b) less than 2 (c) less than 3 (d) less than 4
- If a pair of linear equations is consistent, then the lines will be
(a) always coincident (b) always intersecting (c) parallel (d) intersecting or coincident
- If $\cos \theta + \cos^2 \theta = 1$, the value of $\sin^2 \theta + \sin^4 \theta$ is
(a) 0 (b) 1 (c) -1 (d) 2
- Sides of two similar triangles are in the ratio 4: 25. Areas of these triangles are in the ratio
(a) 2: 5 (b) 4: 25 (c) 16: 625 (d) 625: 16
- What is the maximum value of $1/\text{cosec } \theta$?
(a) 0 (b) $1/2$ (c) $2/\sqrt{3}$ (d) 1
- $5 \text{ cosec}^2 \theta - 5 \cot^2 \theta =$
(a) 1 (b) 10 (c) 0 (d) 5
- Construction of a cumulative frequency table is useful for finding:
(a) mean (b) median (c) mode (d) none of these

SECTION B { 16 marks }

11. Find HCF of 144 and 120 using prime factorization method. Hence, find their LCM
12. On dividing $x^4 + 2x^3 + 8x^2 + 12x + 18$ by a polynomial $x^2 + 5$, the remainder comes out to be $ax + b$. Find 'a' and 'b'
13. Solve for x and y : $49x - 57 = 172$; $57x - 49y = 252$ Or
13. Given below are three equations two of them have infinite solutions and one has a unique solution. State the two pairs. (i) $3x - 2y = 4$ (ii) $6x + 2y = 4$ (iii) $9x - 6y = 12$.
14. Solve by cross multiplication method: $x + 4y + 9 = 0$; $5x = y + 1$
15. In ΔABC , $PQ \parallel BC$ and $AP : PB = 4 : 5$. Find $\text{ar}(\Delta ABC) : \text{ar}(\Delta APQ)$
16. Two poles of heights 12 m and 22 m stand on plane ground. If the distance between the feet of the poles is 24 m. find the distance between their tops.
17. Evaluate: $\frac{\sin 60^\circ}{\cos^2 45^\circ} - \cot 30^\circ + 15 \cos 90^\circ$ Or
17. In ΔOPQ , $\angle P = 90^\circ$, $OP = 7$ cm and $OQ - PQ = 1$ cm, find the values of $\sin Q$ and $\cot Q$
18. Evaluate: $\frac{\sin 30 + \tan 45}{\sec 30 + \cos 60} \cdot \text{cosec } 60 + \cot 45$

SECTION C { 30 marks }

19. Find the value of $\sin 60^\circ$ and $\tan 30^\circ$ geometrically Or
19. Prove that: $\frac{1}{\cos^2 \theta} - \left(\frac{\sin^2 \theta - 2\sin^4 \theta}{2\cos^4 \theta - \cos^2 \theta} \right) = 1$
20. $\frac{\tan^3 \theta}{1 + \tan^2 \theta} + \frac{\cot^3 \theta}{1 + \cot^2 \theta} = \sec \theta \cdot \text{cosec } \theta - 2\sin \theta \cdot \cos \theta$ Or

20. Without using trigonometric tables evaluate;

$$3\left(\frac{\sin 36^\circ}{\cos 54^\circ}\right)^2 - 2\left(\frac{\tan 18^\circ}{\cot 72^\circ}\right)^3 + 2 \tan 13^\circ \cdot \tan 21^\circ \cdot \tan 30^\circ \cdot \tan 69^\circ \cdot \tan 77^\circ + \sin 60^\circ$$

21. If the median of given data is 32.5, find the values of a and b

Class Interval	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	Total
Frequency	a	5	9	12	b	3	2	40

22. Find the modal marks from the given table:

Marks	5-10	10-15	15-20	20-25	25-30	30-35	35-40
No. of students	3	5	9	23	21	12	3

22. Find the mean of the given table by step deviation method.

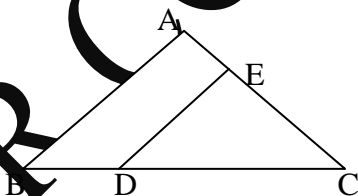
Pocket money (in Rs)	15 – 25	25 – 35	35 – 45	45 – 55	55 – 65	65 – 75	75 – 85
No. of students	12	22	14	8	8	4	2

23. O is any point inside a rectangle ABCD. Prove that $OA^2 + OC^2 = OB^2 + OD^2$ Or

23. In an equilateral ΔABC the side BC is divided at D such that $BD = \frac{1}{5} BC$.

Prove that $25AD^2 = 21 AB^2$

24. In the figure, seg DE \parallel side AB, DC = 2BD, ar (ΔCDE) = 40 cm², find ar ($\square ABDE$) Or



24. BL and CM are medians of ΔABC with $\angle A = 90^\circ$. Prove that $4(BL^2 + CM^2) = 5 BC^2$

25. Draw graph of equations $x - 3y + 6 = 0$ and $3x + y = 12$. Find the area bounded by these lines and x -axis.

26. Find all the zeroes of the polynomial $x^4 + 4x^3 - 2x^2 - 20x - 15$ if two its zeroes are $\sqrt{5}$ and $-\sqrt{5}$.

27. Show that the square of any positive odd integer is of the form $8m + 1$, for some integer m Or

27. Check whether there is any value of $n \in \mathbb{N}$ for which 12^n ends with the digit zero

28. Prove that $\sqrt{2} - \sqrt{5}$ is an irrational number

SECTION D {24 marks}

29. Prove that: $\left(\frac{1 + \sin \theta - \cos \theta}{1 + \sin \theta + \cos \theta}\right)^2 = \frac{1 - \cos \theta}{1 + \cos \theta}$ Or

29. Prove that: $(1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A) = 2$

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

30. Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

31. The mean of the frequency table is 50. Find the values of f_1 and f_2

Class	0-20	20-40	40-60	60-80	80-100	Total
Frequency	17	f_1	32	f_2	19	120

32. Draw a more than type ogive and less than ogive for given data and find median income from the graph

Income (in Rs)	0 - 100	100 - 200	200 - 300	300 - 400	400 - 500	500 - 600
No. of persons	7	15	35	28	10	5

33. A boat goes 12 km upstream and 40 km downstream in 8 hours. It can go 16 km upstream and 32 km downstream in the same time. Find the speed of boat in still water and the speed of the stream Or

33. Navein travels 760 km to his home partly by train and partly by car. He takes 8 hours if he travels 160 km by train and the rest by car. He takes 12 minutes more if he travels 240 km by train and the rest by car. Find the speed of the train and car.

34. Prove that: $\frac{(1 + \cot \theta + \tan \theta)(\sin \theta - \cos \theta)}{\sec^3 \theta - \operatorname{cosec}^3 \theta} = \sin^2 \theta \cdot \cos^2 \theta$

You create the outcome of every situation in your life, and it all starts out in your mind. Always maintain a positive mindset and concentrate only on the things that you want and you will achieve anything that you set out for.

ALL THE BEST !

AJESH NAIR'S

NAIR COACHING ACADEMY

SNO 36/1/2, ARCHANA NIWAS, NEAR DURGA MATA TEMPLE,
BEHIND DUTT HOTEL, YASHWANT NAGAR, KHARADI ROAD,
PUNE - 411014

CONTACT NO. 9850667744

NAIR COACHING ACADEMY