

MAA MANGLACOACHING INSTITUTE

MANGLA BHAWAN MARANPUR HAUNUMAN NAGAR GAYA

PERIODIC TEST

CLASS- X

MATHEMATICS

F.M-80

[SECTION A]

$$1 \times 20 = 20$$

Select the correct alternative: [$1 \times 10 = 10$]

- On dividing a positive integer n by 9, we get 7 as remainder. What will be the remainder if $(3n-1)$ is divided by 9?
a) 1 b) 2 c) -3 d) 4
- How many polynomials are there having 4 and -2 as zeros?
a) one b) Two c) Three d) More than three
- Which of the following measures of central tendency is influenced by extreme values?
a) Mean b) Median c) Mode d) None of these.
- If triangle ABC is right angled at C, then $\cos(A+B) = ?$
a) 0 b) $1/2$ c) 1 d) $\frac{\sqrt{3}}{2}$
- If $(\sin \theta + \cos \theta) = a$ and $(\sin^3 \theta + \cos^3 \theta) = b$, then $(3a-2b) = ?$
a) A^3 b) b^3 c) 0 d) 1
- If one root of the equation $2x^2 + ax + 6 = 0$ is 2, then $a = ?$
a) 7 b) -7 c) $7/2$ d) $-7/2$
- The sum of first 100 natural numbers is
a) 4950 b) 5050 c) 5000 d) 5150
- Which of the following cannot be the probability of an event?
a) 1.5 b) $3/5$ c) 25 % d) 0.3
- If $\sin 3A = \cos(A-10)$, Where $3A$ is an acute angle then $\angle A = ?$
a) 35 b) 25 c) 20 d) 27
- If $\cos A = 4/5$, then $\tan A = ?$
a) $3/5$ b) $5/3$ c) $3/4$ d) $4/3$

[EACH QUESTION CARRY 1 MARK]

11. Find a quadratic polynomial whose zeros are 2 and -5.
12. The mean of 20 numbers is zero. Of them, at the most, how many may be greater than zero?
13. Verify that 2 is a zero of the polynomial $x^3+4x^2-3x-18$.
14. The HCF of two numbers is 27 and their LCM is 162. If one of the numbers is 54, what is the other number?
15. Prove that $(\sec^2\theta-1)(\operatorname{cosec}^2\theta-1)=1$
16. Find the 35th term of the AP 6, 9, 12, 15.
17. The mean of 2, 7, 6 and x is 15 and the mean of 18, 1, 6, x and y is 10. What is the value of y?
18. If $\cot \theta = 2$, Find the values of all T-ratios of θ .
19. If the centroid of $\triangle ABC$ whose vertices are A (a,b), B(b,c) and C(c,a) is the origin then find the value of (a+b+c).
20. If the points A(2,3), B(4,k) and C(6,-3) are collinear, find the value of k.

[SECTION B]

Each question carry 2 marks

21. In a triangle ABC, right angled at B, it is given that $AB=12$ CM AND $bc=5$ cm. Find the value of i) $\cos A$ ii) $\operatorname{Cosec} A$ iii) $\cos C$ iv) $\operatorname{cosec} C$.
22. If $\sin \theta + \cos \theta = p$ and $\sec \theta + \operatorname{cosec} \theta = q$, show that $q(p^2-1)=2p$
23. If A, B, C are the angles of the triangle ABC, show that $\sin\left(\frac{B+C}{2}\right) = \cos \frac{A}{2}$
24. If the mean of 25 observations is 27 and each observations is decreased by 7, what will be the new mean?
25. The 7th term of an AP is -4 and its 13th term is -16. Find the AP.
26. Two coins are tossed simultaneously. What is the probability of getting at least one head?

[SECTION C]

Each question carry 3 marks

27. Calculate the median for the following data :

Marks Obtained	No. of Students
Below 10	6
Below 20	15
Below 30	29
Below 40	41
Below 50	60
Below 60	70

28. Find the zeros of the quadratic polynomial (x^2-5) and verify the relation between the zeros and the coefficients.

29. Find the point on x-axis which is equidistant from the points (5,-2) and (-3,2).

30. Prove that $(1 + \cot \theta - \operatorname{cosec} \theta)(1 + \tan \theta + \sec \theta) = 2$.

31. If the area of ΔABC with vertices $A(x,y)$, $B(1,2)$ and $C(2,1)$ is 6 sq units then prove that $x+y=15$ or $x+y+9=0$.

32. If two zeros of the polynomial $f(x)=(x^4-6x^3-26x^2+138x-35)$ are $(2+\sqrt{3})$ and $(2-\sqrt{3})$, Find other zeros.

33. If $\sec 4A = \operatorname{cosec}(A-15^\circ)$, where $4A$ is an acute angle, Find the value of A .

34. Find the middle term of the AP 10, 7, 4,, (-62).

SECTION D

[Each questions carry 4 marks]

35. Show that the points (1,1), (-1,5), (7,9) and (9,5) taken in that order are the vertices of a rectangle. Also, find the area of the rectangle.

36. The sum of the 4th term and 8th term of an AP is 24 and the sum of its 6th and 10th terms is 44. Find the first three terms of the AP.

37. How many 3 digit numbers are divisible by 7?

38. Find the missing frequencies in the following frequency distribution table ,if $N=100$ and median is 32.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	Total
Number of Students	10	?	25	30	?	10	100

39. What is the probability that an ordinary year has 53 Sundays?

40. IF $R(x,y)$ is a point on the line segment joining the points $P(a,b)$ and $Q(b,a)$,then prove that $x+y=a+b$.