2022-23
ALL INDIA MATHS CHALLENGE EXAM (AIMCE)

Name of the Student : ______________________ Roll No.:

Name of the School : ______________________ Date : ____________

Class : Subject: Mathematics Time: 60 Min

Instructions to the Candidate

1. Each question carries 1 mark. There is no negative marking.
2. Separate Optical Mark Reader (OMR) Answer Sheet is supplied to you along with question paper booklet.
3. Read the questions carefully and fill in the circle corresponding to your answer. Fill in the circle Completely.
4. Rough work should be done only in the space provided in the Question Paper Booklet.
5. Return the OMR Answer sheet to the invigilator before leaving the examination hall.
6. You can carry the question paper with you after completing the examination.
7. Once you enter the examination hall, you are not permitted to leave till the end of the examination.

IX Class Mathematics

1. If $x = \frac{1}{2-\sqrt{3}}$, then the value of $x^3 - 2x^2 - 7x + 5$ is ______

(A) 1 (B) 2 (C) 3 (D) 4

2. One of the factor of $x^2 + \frac{1}{6}x - \frac{1}{6}$ is _______

(A) $(1-3x)$ (B) $(3x-1)$ (C) $(2x-1)$ (D) $(1-2x)$

3. If the polynomials $ax^3 + 4x^2 + 3x - 4$ and $x^3 - 4x + a$ have the same remainder when divided by $(x-3)$ then the value of 'a' = _____

(A) 1 (B) –1 (C) 2 (D) –2

4 If $x : y = 2 : 3$, then the value of $3x + 2y : 9x + 5y$ is ____

(A) $2:3$ (B) $4:9$ (C) $8:27$ (D) $4:11$

5. If 'b' is the mean proportional between 'a' and 'c' then $\frac{a^3+b^3+c^3}{a^2 b^2 c^2} =$ ______

(A) $\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2}$ (B) $a^2 + b^2 + c^2$ (C) $a^3 + b^3 + c^3$ (D) $\frac{1}{a^3} + \frac{1}{b^3} + \frac{1}{c^3}$

6. The sum of two numbers is 99. If one number is 20% more than the other, then the two numbers are?

(A) 45 and 54 (B) 72 and 27 (C) 18 and 81 (D) 90 and 09

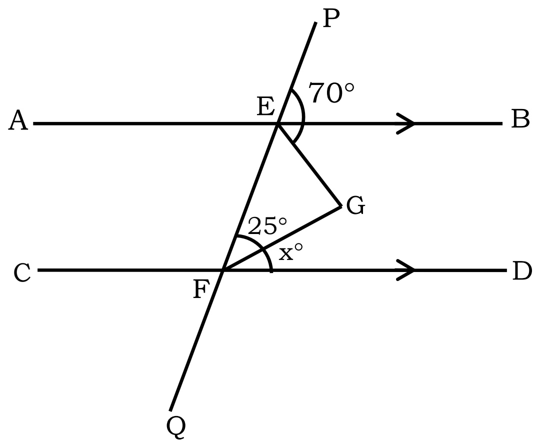
7. A medical student has to secure 40% marks to pass. He gets 40 and fails by 40 marks, find the maximum marks.

(A) 80 (B) 160 (C) 200 (D) 240

8. A factors increased its production of three wheelers from 80,000 in 2021 to 92610 in 2022, the annual rate of growth of production of three wheelers

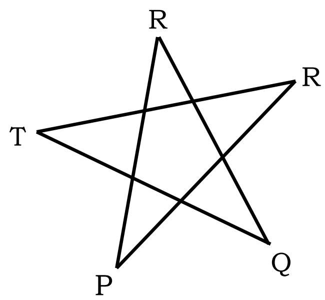
(A) 4% (B) 5% (C) 6% (D) 7%

9. In the adjacent figure, AB||CD and transversal PQ cuts AB at E and CD at F. If $\angle PEB = 70°$, $\angle BEG = 30°$, $\angle EFG = 25°$, find $\angle GFD$



(A) 75° (B) 125° (C) 55° (D) 45°

10. From the adjacent figure the value of $\angle P + \angle Q + \angle R + \angle S + \angle T$ is _____



(A) 180° (B) 270° (C) 360° (D) 540°

11. Two circles touch externally. The sum of their areas is 130π sq.cm and the distance between their centres is 14 cm, then the radii of circles are _____

(A) 11 cm and 3 cm (B) 7 cm and 3 cm

(C) 10 cm and 4 cm (D) 11 cm and 7 cm

12. Surya Kumar in his 12^{th} inning makes a score of 63 runs and there by increases his average by 2. What is his average after the 12^{th} inning?

(A) 39 (B) 41 (C) 43 (D) 63

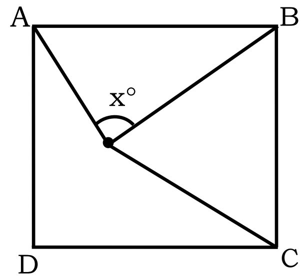
13. The sum of deviation of a set of values $x_1, x_2, ...x_n$ measured from 50 to –10 and the sum of deviations of the values from 46 is 70, then the mean is ____

(A) 20.5 (B) 48.5 (C) 47 (D) 49.5

14. If $x.x.x.x.x-----(2021\text{ times})=x^y$ and $2^y+2^y=2^z$ then z = ______

(A) 2023 (B) 2022 (C) 2^{2021} (D) 2021^2

15. ABCD is a square and BOC is an equilateral triangle as shown in the adjoining figure, then the value of x is



(A) 15° (B) 30° (C) 45° (D) 75°

16. If the radius of the circle is increased by 100%. Then the area is increased by ______

(A) 100% (B) 200% (C) 300% (D) 400%

17. A prime number N from 10 to 50 remains unchanged when its digits are reversed. The square of such number is _____

(A) 1089 (B) 1890 (C) 1908 (D) 121

18. $7^{13}+6^{13}$ is divisible by _____

(A) 11 (B) 13 (C) 17 (D) 19

19. If $132a+143b+2c=277$, then the value of c is ______

(A) 1 (B) 2 (C) 3 (D) 4

20. If $2=x+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{4}}}$, then the value of x = ______

(A) $\frac{18}{17}$ (B) $\frac{12}{17}$ (C) $\frac{21}{17}$ (D) $\frac{13}{17}$

21. The last digit of the number obtained by multiplying the numbers $81\times82\times83\times84\times-----\times89$ will be

(A) 0 (B) 1 (C) 7 (D) 9

22. The number of rectangles that can find on a chessboard is

(A) 1392 (B) 1651 (C) 1296 (D) 1024

23. If $A=\{1,2,3,4,5,6\}$, $B=\{3,6,7,8\}$ are subsets of $\mu=\{1,2,3,4,5,6,7,8\}$ then $n(A' \cup B')=$_______

(A) 6 (B) 3 (C) 4 (D) 5

24. A convex polygon has 44 diagonals. The number of its sides is __.

(A) 10 (B) 11 (C) 12 (D) 13

25. By selling 18 chocolates, a vendor losses the selling price of 2 chocolates, then the loss percent is ______

(A) 1% (B) 10% (C) 20% (D) 30%

26. Sum of $\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+--------+\frac{1}{210}$ is ______

(A) $\frac{14}{15}$ (B) $\frac{1}{15}$ (C) $\frac{15}{14}$ (D) 15 !

27. If $x+y=8$ and $xy=15$ then the value of x^3-y^3 is _____

(A) 120 (B) 60 (C) 98 (D) 82

28. The value of $\log_y^x \times \log_z^y \times \log_x^z =$ ______

(A) 0 (B) 1 (C) 2 (D) 3

29. If $\sqrt{256}=16$ then $\sqrt{0.000256}=$ ______

(A) 0.016 (B) 0.0016 (C) 0.16 (D) 0.00016

30. The surface area of a sphere of radius 3.5 cm is _____

(A) 308 sq.cm (B) 616 sq.cm (C) 154 sq.cm (D) None of these

31. Positive value of $\sqrt{6+\sqrt{6+\sqrt{6+..........\infty}}}$

(A) 3 (B) 2 (C) 6 (D) –3

32. The point of intersection of medians is called

(A) Mid point (B) ortho centre (C) Incentre (D) Centroid

33. The distance of the point $(3,-4)$ from x-axis is _____

(A) 3 (B) 4 (C) 5 (D) 1

34. Probability of 53 Friday's in a non-leap year is _____

(A) $\frac{364}{365}$ (B) $\frac{366}{365}$ (C) $\frac{1}{7}$ (D) $\frac{2}{7}$

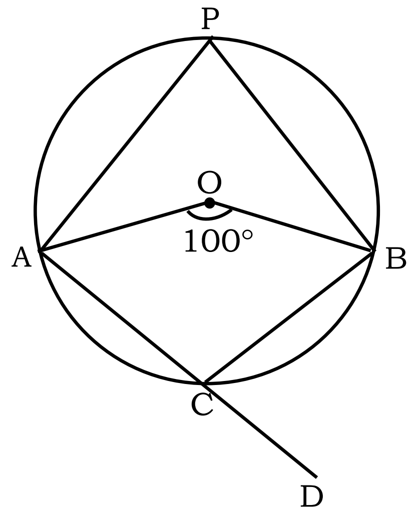
35. Successive discounts of 10% and 30% is equivalent to a single discount of

(A) 40% (B) 35% (C) 38% (D) 37%

36. The H.C.F of 13! And 31! Is _____

(A) 13 (B) 31 (C) 13! (D) 31!

37. In the adjacent figure, O is the centre of circle $\angle AOB = 100°$, then $\angle BCD$ is ___



(A) 80° (B) 40° (C) 60° (D) 50°

38. Each interior angle of a regular polygon is 140°. Then the number of sides is __

(A) 10 (B) 8 (C) 6 (D) 9

39. The value of $\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2}$ is _____

(A) 3 (B) 4 (C) 5 (D) 6

40. The value of $\sqrt[4]{17+\sqrt{288}} =$ _______

(A) $1+\sqrt{3}$ (B) $2+\sqrt{3}$ (C) $3+\sqrt{2}$ (D) $1+\sqrt{2}$