CHINMAYA VIDYALAYA
KEEP SMILING
CHINMAYA MISSION

CMO

CHINMAYA MATHEMATICS OLYMPIAD

SAMPLE PAPER

10

Please fill the following details immediately.

Name: _____

Hall Ticket No.: _____

❖ 50 Questions ❖

❖ Time Allowed : 120 Minutes ❖

❖ Do not open this question paper until the signal is given.

❖ Please check the CLASS printed on the cover page and the inside is same when you open the booklet.

General Instructions:

1) All questions are compulsory and carry equal marks.
2) There is no negative marking.
3) There is only one correct answer hence write one choice only.
4) Please avoid cutting / overwriting etc.
5) Return the paper to the invigilator at the end of the examination.
6) Write the correct option in the given box.

1) A,B,C and D play a game of cards. A says to B, “if I give you 8 cards, you will have as many as C has and I shall have 3 less than what C has”. Also, “If I take 6 cards from C, I shall have twice as many as D has”. If B and D together have 50 cards, how many cards has A got ?

a]40 b] 37 c] 27 d] 23

2) A combination of three colours is being chosen to decorate a room. The colour must be chosen from a group of 7 colours A, B, C, D, E, F and G according to the following conditions:

If A or B is chosen the other must also be chosen.

C and D can’t be chosen together

Either C or A or both must be chosen

Which of the following combination of colours do not confirm the conditions ?

a] A,C,D b] A,E,F c]C,E,G d] None of these

3) Introducing a girl, Mohan said “Her mother is the only daughter of my mother-in-law” How is Mohan related to that girl ?

a] Brother b] Father c] Husband d] Uncle

ROUGH WORK

4) If one of the trigonometric ratios of an ____ is known, the remaining trigonometric ratios of the angle can be easily determined.

a] Acute angle b] Right angle

c] Obtuse angle d] Straight angle

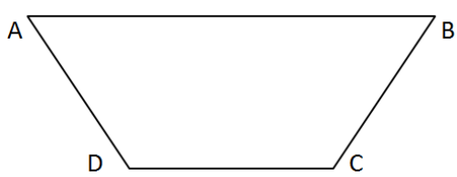
5) A man has a certain number of small boxes to pack into parcels. If he packs 3,4,5 or 6 in a parcel, he is left with one, if the packs 7 in a parcel none is left over. What is the number of boxes, he may have to pack ?

a] 106 b] 301 c] 309 d] 400

6) A bus starts from City X. The number of women in the bus is ½ the number of men. In the City Y, 10 men left the bus and 5 women boarded into it. Now, number of men and women becomes equal. In the beginning, how many passengers entered the bus?

a] 15 b] 30 c] 36 d] 45

7) In the given figure, AB is parallel to DC. Which of the following statement about the figure must be true ?



a] $\angle DAB + \angle ABC = 180°$ b] $\angle DAB + \angle CDA = 180°$

c] AB = DC d] AD = DC

ROUGH WORK

8) A standard deck of 52 cards is shuffled. Arun draws a single card from the deck at random. Ratio of the probability of the card to be a red jack to the probability of the card to be an ace is ----

a] 3/4 b] 1/2 c] 2/3 d] 1/4

9) The 10^{th} term of an AP is 52 and 16th term of an AP is 82. Find the 32^{nd} term.

a]162 b] 132 c] 82 d] 216

10) In a class there are 30 boys who are fat. If these constitute 5/6 of the boys and the total number of boys is 1/3 of the total number of students in the class, what is the number of girls in the class ?

a] 36 b] 49 c] 72 d] 62

11) Pairs of natural numbers whose least common multiple is 78 and the greatest common divisor is 13 are

a] 58 and 13 or 16 and 29 b] 68 and 23 or 36 and 49

c] 18 and 73 or 56 and 93 d] 78 and 13 or 26 and 39

12) A toothed wheel of diameter 50 cm is attached to a smaller wheel of diameter 30 cm. How many revolutions will the smaller wheel make when the larger one makes 15 revolutions ?

a]23 b] 24 c] 25 d] 26

ROUGH WORK

13) If the sum of the areas of two circles with radii R_1 and R_2 is equal to the area of a circle of radius R, then ---

a] $R_1 + R_2 = R$ b] $R_1^2 + R_2^2 = R^2$

c] $R_1 + R_2 < R$ d] $R_1^2 + R_2^2 < R^2$

14) One root of the quadratic equation $2x^2 - x + 1/8 = 0$ is $1/4$. The other root is ____

a] 0 b] $1/8$ c] $1/4$ d] $-1/4$

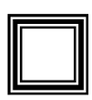
15) Sin 4A = Cos (A-20°), where 4A is an acute angle, find the value of A

a] 22° b] 25° c] 35° d] 60°

16) When a number is divided by 9235, we get the quotient 888 and the remainder 222, such a least possible number is

a] 8200680 b] 8200920

c] 8200902 d] None of these



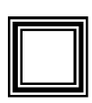
17) The values of p and q for which the given system of linear equations have infinite number of solutions are ----

$2x+3y=9$

$(p+q)\,x + (2p - q)\,y = 3\,(p+q+1)$

a] $P=5/3$, $q=1/3$ b] p=1, q=5

c] p=4,q=-2 d] p=4,q=-1



ROUGH WORK

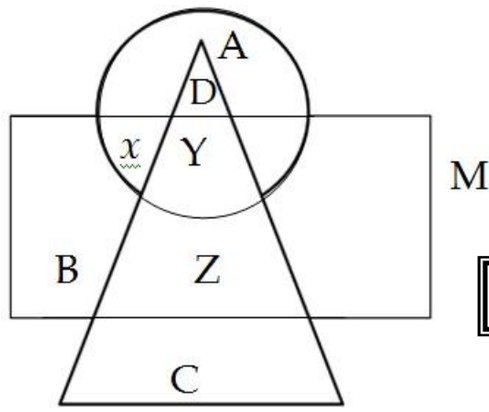
18) 2 dice are thrown simultaneously. What is the probability that the sum of the 2 numbers appearing on the top of the dice is less than 6 ?

a] 13/23 b] 17/36 c] 5/18 d] 3/13

19) 105 goats, 140 donkeys and 175 cows have to be taken across a river. There is only one boat which will have to make many trips in order to do so. The lazy boat man has his own conditions for transporting them. He insists that he will take the same number of animals in every trip and they have to be of same kind. He will naturally like to take the largest possible numbers each time. The total number of animals went in each trip is _____

a] 35 b] 75 c] 63 d] 154

20) In the given diagram, the circle stands for college professors, the triangle stands for surgical specialists and medical specialists are represented by the rectangle. Surgical specialists who are also medical specialists but not college professors are represented by



a] Z b] C

c] *x* d] B

ROUGH WORK

21) Find the zeroes of the polynomial $f(x) = x^3-5x^2-2x+24$, if it is given that the product of its two zeroes is 12 and are

a] 3,4,-2 b] 3,4,2 c] -3,-4,-2 d] 3,-4,-2

22) A carton contains some identical cups. Out of these, 5 cups are red, 3 cups are green, 4 cups are blue, 6 cups are black and remaining cups are yellow. A cup is picked at random from the carton. If the probability of picking a yellow cup is 1/10, then what is the probability of picking either a red or a green cup ?

a]1/5 b] 2/5 c] 4/5 d] 3/5

23) A conical vessel whose internal radius is 10cm and height 72 cm is full of water. If this water is poured into a cylindrical vessel with internal radius 30 cm, the height of the water level rises in it is _____ cm

a] 11/3 b] 4/3 c] 17/3 d] 8/3

24) Median of the observation

xi	5	6	7	8	9	10
fi	4	5	7	9	7	6

is ___

a] 9 b] 10 c] 7 d] 8

ROUGH WORK

25) A frog tries to come out of the well. It climbs 40 feet at the beginning of each hour and rests for a while when it slips back 20 feet before it starts climbing in the beginning of the next hour. If it begins its ascent at 7 am, between what time will it first touch the upper part of the well at 140 feet from the base of the well?

a] 12pm to 1 pm, b] 2 pm to 3 pm

c] 1 pm to 2 pm d] 3 pm to 4 pm

26) 13,x,y and 31 are the 4 consecutive terms of an AP : Find out the respective values of x and y.

a]18 & 25 b] 19 and 29 c] 19 & 25 d] 25 & 34

27) What is the sum of the first 15 multiples of 13 ?

a] 21000 b] 1240 c] 1780 d] 1560

28) A shirt manufacturing unit produced 300 shirts in the first month and 400 shirts in the 3rd month. If the production of shirts increases uniformly by a fixed number of shirts every month, then what is the total number of shirts produced in the first year?

a] 7100 b] 6200 c] 6900 d] 5700

ROUGH WORK

29) How many lead shots each 3 mm in diameter can be made from a cuboid of dimensions 9 cm x 11 cm x 12 cm ?
a] 7200 b] 8400 c] 72000 d] 84000

30) A farmer wishes to start a 100 sq. m rectangular vegetable garden. Since he has only 30 m barbed wire, he fences 3 sides of the garden letting his house compound wall act as per the fourth side fencing. The dimensions of the garden is
a]15m x 6.67m b] 20m x 5m
c] 30m x 3.33m d] 40m x 2.5m

31) A forester wants to plant 66 apple trees, 88 banana trees and 110 mango trees in equal rows (in terms of number of trees). Also he wants to make distinct rows of trees. (i.e. only one type of trees in one row). The number of minimum rows required are
a] 2 b] 3 c] 10 d] 12

32) 5 students participated in an examination and each scored different marks. Nidhi scored higher than Mamta. Kavita scored lower than Prashant but higher than Nidhi. Anil's score was between Mamta and Nidhi. Which of the following pairs represents the highest and the lowest scores respectively?
a] Nidhi, Kavita b] Kavita, Mamta
c] Prashant , Mamta d] Anil, Kavita

ROUGH WORK

33) If the HCF of 210 and 55 is expressible in the form 210x5+55 y, find y.

a] 5 b] -15 c] 14 d] -19

34) If the mean of the following distribution is 54, find the value of p.

Class	0 - 20	20 - 40	40 – 60	60 - 80	80 - 100
Frequency	7	p	10	9	13

a] 9 b] 11 c] 8 d] 10

35) Three ducks and two ducklings weigh 32 kg. Four ducks and three ducklings weigh 44 kg. All ducks weigh the same and all ducklings weigh the same. What is the weight of two ducks and one duckling ?

a] 20 kg b] 40 kg c] 60 kg d] 64 kg

36) If + stands for “division”, x stands for “addition”, - stands for “multiplication” and ÷ stands for “subtraction”, then which of the following equations is correct ?

a] 36 x 6 + 7 ÷2-6=20 b] 36 ÷6+3x5-3=45

c] 36+6-3x5 ÷3=24 d] 36-6+3x5 ÷3=74

ROUGH WORK

37) What is the smallest number of ducks that could swim according to this information. " Two ducks in front of a duck, two ducks behind a duck and a duck between two ducks"

a] 3 b] 5 c] 4 d] 7 

38) Half cubic metre of gold sheet is extended by hammering so as to cover an area of 1 hectare. The thickness of the sheet is 

a] 0.0005 cms b] 0.005 cm c] 0.05 cm d] 0.5 cm

39) Seven times of a 2 digit number is equal to four times the number obtained by reversing the order of digits and the sum of the digits is 3. Find the number. 

a] 12 b] 10 c] 15 d] 20

40) A towel, when bleached, was found to have last 20% of its length and 10% of its breadth. The percentage of decrease in area is _____ 

a] 10% b] 10.08% c] 20% d] 28%

41) Which of the following statement is correct?

a] If $x^6 + 1$ is divided by x+1, then the remainders is -2.

b] If $x^6 + 1$ is divided by x-1, then the remainder is 2.

c] If $x^6 + 1$ is divided by x+1, then the remainder is 1. 

d] If $x^6 + 1$ is divided by x-1, then the remainder is -1.

ROUGH WORK

42) Match the column :

	Column I		Column II
1	2x + 5y = 10 3x + 4y = 7	a]	Unique solution
2	2x + 5y = 10 6x + 15y = 20	b]	Infinitely many solutions
3	5x + 2y = 10 10x + 4y = 20	c]	No solution

a] 1→A, 2→B, 3→C b] 1→B, 2→C, 3→A c] 1→C, 2→B, 3→A d] 1→A, 2→C, 3→B

43) In the given question, which pair of numbers is different from the other three ?

a] 13-2197 b] 15-3375 c] 14-2744 d] 18-5834

44) A mechanic has two pieces of sand paper of different sizes. Each piece is in the shape of a circle. The radius of the larger circle is 4 times the radius of the smaller circle. The area of the largest circle is how many times the area of the smaller circle ?

a]2 b] 4 c] 8 d] 16

ROUGH WORK

45) The largest value among 4/5, 80%, 0.801 and $(0.9)^2$ is
a] 4/5 b] 80% c] 0.801 d] $(0.9)^2$

46) Graph of a quadratic polynomial is a
a] Straight line b] Circle c] Parabola d] Ellipse

47) If the circumference of a circle and the perimeter of a square are equal, then
a] Area of circle = area of square
b] Area of circle > area of square
c] Area of circle < area of square
d] Nothing definite can be said

48) "A" walks 10 metre towards East and then 10 metre to his right. Then every time turning to his left, he walks 5, 15 and 15 metre respectively. How far is he now from his starting point ?
a] 5m b] 10m c] 15m d] 20m

49) Rahul was asked his age by his friend. Rahul said "the number you get when you subtract 25 times of my age from twice the square of my age will be thrice your age." If the friend's age is 14, then the age of Rahul is
a] 20 b] 22 c] 18 d] 14

ROUGH WORK

50) A sailor goes 8 km downstream in 40 minutes and comes back in one hour. Determine the speed of the sailor in still water and speed of the current.

a] 10 km / hr, 2 km/hr b] 9 km / hr, 2 km/hr

c] 8 km / hr, 3 km/hr d] 6 km/hr, 4 km/hr

ROUGH WORK