CREST Teacher Mathematics Olympiad (CTMO)

Sample Paper

Pattern and Marking Scheme				
Stage	**Topic/Section**	**No. of Questions**	**Marks per Question**	**Total Marks**
For stage II (Grades 4-6)	Practical Mathematics	30	3	90
	Achiever's Section	20	6	120
Grand Total		**50**		**210**

The total duration of the exam is 60 minutes.

Note: For every incorrect answer, there's a penalty of 1/3rd of the total marks allotted to that question.

Syllabus

Number system, Numbers and operations - Fractions, Numbers and operations - Decimals, Expressions and equations, Measurements, Ratio and proportion, Geometry, Statistics and data handling
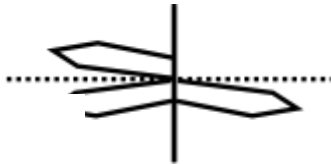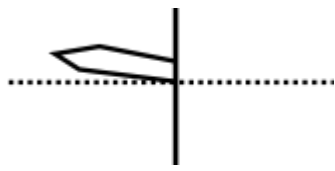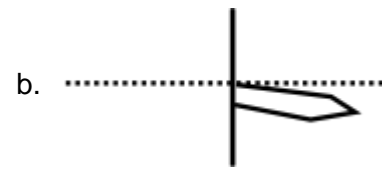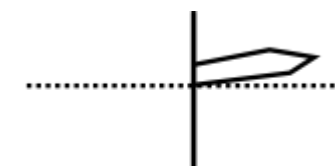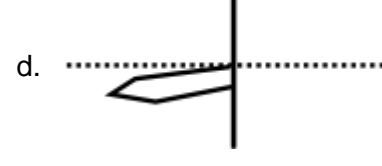
For more details visit: https://www.crestolympiads.com/teacher-mathematics-olympiad

1. In the figure given below, PQR is an equilateral triangle and QRS is an isosceles triangle. Find the value of x:
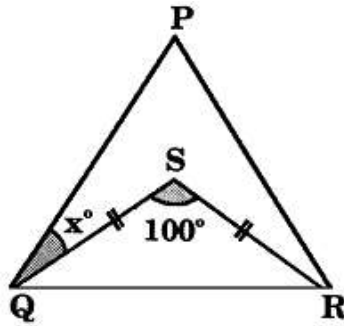
    a. 10°
    b. 20°
    c. 30°
    d. 40°

2. Choose the correct option to complete the given picture.

    a.
    b.
    c.
    d.

3. In 6056555, at which place, the sum of the place value of the digit and its face value is equal to 505?

    a. Ones
    b. Tens
    c. Hundreds
    d. Ten thousands

4. Which odd number from the given options results from multiplying four unique prime numbers if it starts from the smallest odd prime number?

    a. 210
    b. 1155
    c. 945
    d. 2079

5. Find the successor of the smallest 5-digit number formed by the digits 2, 6, 0 and 3 where 0 is repeated twice.

a. 20025

b. 23700

c. 23601

d. 20037

6. A bunch of keys contains 216 number of keys. How many numbers of bunches can be made from the given bunch of keys that can contain 6 number of keys in each bunch?

a. 30

b. 42

c. 48

d. 36

7. In a division sum, Alex took 72 as divisor instead of 27 by mistake. His answer was 24. What is the correct answer?

a. 62

b. 63

c. 64

d. 65

8. Two ropes of length 18 metres and 24 metres have been divided into 8 pieces of the same length separately. The difference of lengths of one smaller and one bigger piece is:

a. 105 cm

b. 85 cm

c. 75 cm

d. 65 cm

9. A man runs 3 km in 15 minutes. He takes rest for 10 minutes after every 30 minutes. What is the total distance covered by him in 1 hour 50 minutes?

a. 15 km

b. 16 km

c. 18 km

d. 21 km

10. When Merry multiplies a certain number by 13 and adds 17 to the product, she gets 134. Find the number.

a. 7

b. 9

c. 8

d. 11

11. The sum of three consecutive odd numbers is 69. What is the average of the first number and the last number will be:

a. 25

b. 23

c. 19

d. 21

12. The value of the given expression will be:
3 + {(– 99) + 98 + (– 97) + 96 + (– 95) + 94}

a. 0

b. 3

c. -3

d. 6

13. Given that 11111 = 41 × 271 where 41 and 271 are prime numbers, then total how many one-digit prime numbers are the factors of 733326?

a. 2

b. 3

c. 4

d. 5

14. If 42/112 = *a*/224 = 12/*b*, where *a* and *b* are numerator and denominator of the fractions, then the fraction (*a* + *b*)/(*a* – *b*) is equal to:

    a. 18/17   b. 15/13
    c. 23/13   d. 29/13

15. If we add 13.009 and the smallest possible decimal up to three places, what will be the result?

    a. 13.19   b. 13.91
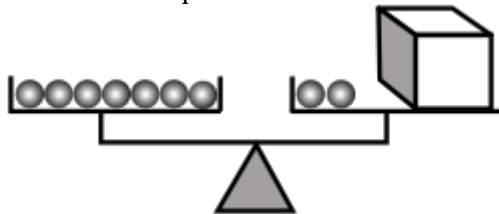   c. 13.01   d. 14.19

16. If the cost of 2 $\frac{1}{4}$ kg of rice is $18, then the cost of 3 $\frac{1}{2}$ kg of rice will be:

    a. $21   b. $28
    c. $35   d. $24

17. To a number, $\left(\frac{1}{2} - \frac{1}{3}\right)$ is added. From the sum so obtained, $\frac{1}{2}$ of $\frac{1}{3}$ is subtracted and the difference is equal to (1/2 + 1/3). Find the number.

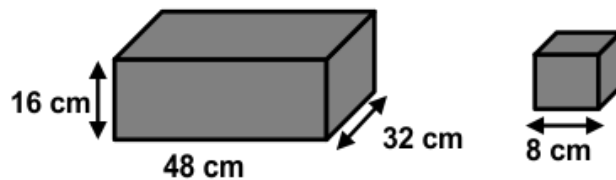   a. $\dfrac{7}{6}$ b. $\dfrac{7}{5}$
    c. $\dfrac{5}{6}$ d. $\dfrac{6}{5}$

18. In this figure, the weight of the box is $\frac{3}{4}$ kg. What is the weight of each ball?
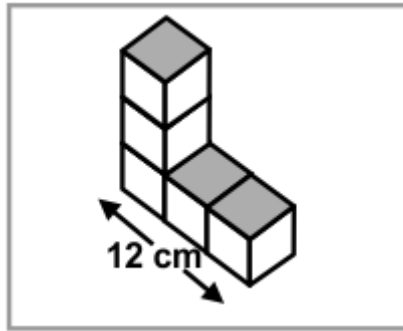

    a. 125 g   b. 150 g
    c. 175 g   d. 200 g

19. How many cubes of side 8 cm can be cut from a cuboid measuring 48 cm × 32 cm × 16 cm?
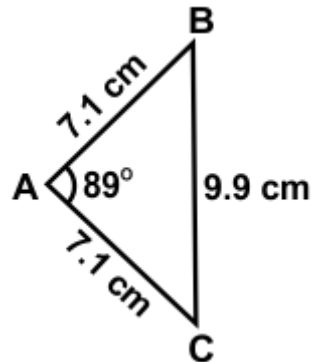

    a. 24   b. 36
   c. 48   d. 56

20. The given figure is made up of identical cubes.
Find the volume of the whole figure.

- a. 384 cm³
- b. 135 cm³
- c. 320 cm³
- d. 1080 cm³

21. The breadth of a rectangular field is one-third of its length. If the perimeter of the field is 40 m then what is the area of the field?

- a. 60 m²
- b. 75 m²
- c. 90 m²
- d. 105 m²

22. Which of the following options describes the triangle given below?
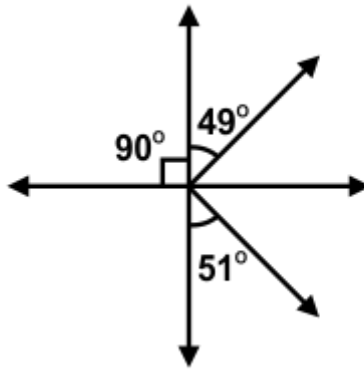

- a. Scalene, Obtuse
- b. Isosceles, Obtuse
- c. Scalene, Acute
- d. Isosceles, Acute

23. The sum of the numbers of lines, rays and line segments in this figure is:
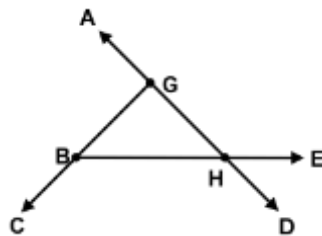
- a. 9
- b. 10
- c. 11
- d. 12

24. How many acute angles are there in the given figure?

a. 4

b. 5

c. 6

d. 3

25. Which one of the following numbers will replace the question mark (?) in this pattern?
13, 20, 18, 25, ?, 30, 28

a. 32

b. 27

c. 22

d. 23

26. In the figure pattern given below, how many unit squares will be there in pattern (11)?

Pattern (1)   Pattern (2)
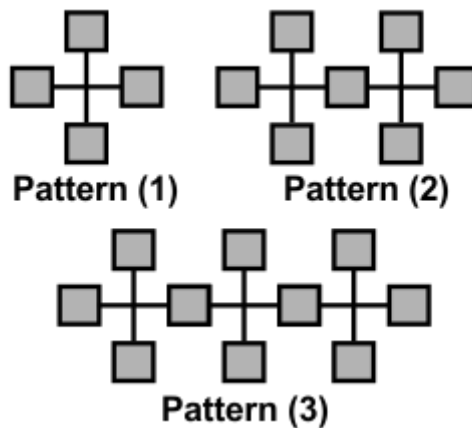
Pattern (3)

a. 34

b. 37

c. 31

d. 39

27. Find the value of X in the number pattern given below if each of the numbers is the sum of the two numbers directly above it.

8	6	Z	4
	14	8	Y
		20	Y + Z + 5
		X	

a. 32

b. 33

c. 34

d. 35

**28.** A box contains 20 kg of tea leaves3. If 7500 grams has been taken out for a tea party. then what is the ratio of the tea leaves left to that of the original quantity?

    a. 3 : 8   b. 9 :16

    c. 5 : 8   d. 5 : 9

29. Robin ate one full bar of chocolate. Then he divided another one into 12 equal parts and ate 8 of these parts. The total chocolate that he ate in terms of the fraction will be:

    a. $2 \, ^1/_2$ b. $1 \, ^2/_3$

    c. $1 \, ^3/_4$ d. $1 \, ^1/_6$

30. A rectangular hall is 18.5 m long and 10 m wide. A square carpet of side 13 m is laid on its floor. Find the area of the floor which is not carpeted.

    a. 14 m^2 b. 16 m^2

    c. 22 m^2 d. 26 m^2

Achievers' Section (Each Question is 6 Marks)

31. The sum of an unknown number and 75 is 199. What will be the difference between 57 and this unknown number?

    a. 67   b. 76

    c. 47   d. 74

32. Which one of the following digits should be at the place of * in the number 23*7246 so that 11 become factors of it?

    a. 2   b. 3

    c. 4   d. 0

33. The H.C.F. of $(5^3 - 3^3)$ and $(4^3 - 2^3)$ is equal to:

    a. $5^2 + 2^2 + 1^2$ b. $4^2 + 3^2 + 1^2$

    c. $3^2 + 2^2 + 1^2$ d. $4^2 + 1^2$

34. The floor of a hall is 16 m 80 cm and 15 m 12 cm broad. Find the least number of square tiles of the same size needed to cover the entire hall.

    a. 162   b. 81

    c. 90   d. 168

35. What is the decimal equal to the fraction represented by the shaded parts in this figure?

a. 0.6
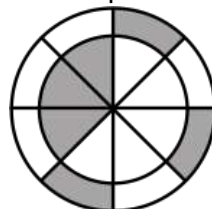
b. 0.625

c. 0.375

d. 0.3

36. The weight of an empty gas cylinder is 14 $^3/_4$ kg and it contains 15 $^2/_3$ kg of gas. What is the weight of the cylinder filled with gas?

a. 29 $^7/_{12}$ kg

b. 30 $^7/_{12}$ kg

c. 31 $^1/_{12}$ kg

d. 30 $^5/_{12}$ kg

37. A box contains 60 packets of biscuits each weighing 250 grams. Maximum how many such boxes can be loaded in a van which cannot carry beyond 1000 kilograms?
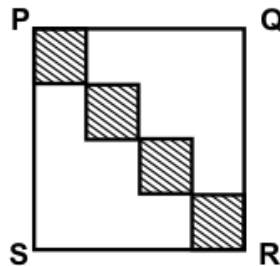
a. 65

b. 66

c. 67

d. 68

38. Which one of the following numbers *cannot* divide the given sum completely?
$5^{17} + 5^{18} + 5^{19}$

a. 775

b. 31

c. 175

d. 155

39. Four identical shaded squares lie inside the square PQRS as shown below. If the area of one shaded square is 64 cm^2, then what is the perimeter of the square PQRS?

a. 64 cm

b. 96 cm

c. 128 cm

d. 112 cm

40. Two acute angles of a right-angled triangle are in the ratio 2 : 3. What is Their difference?

a. 15°

b. 18°

c. 21°

d. 24°

41. The sum of 6 angles of a heptagon is 798°. What is the remaining angle?

a. 98°

b. 112°

c. 108°

d. 102°

42. In this figure, eight squares are shaded. Minimum how many more such squares should be shaded so that the given line *l* become the line of symmetry of the figure?

a. 4　　　　　　　　　　　　　　　　b. 5
c. 3　　　　　　　　　　　　　　　　d. 2

43. If the H.C.F. of any two numbers is 12, then which one of the following numbers cannot be their L.C.M.?

a. 132　　　　　　　　　　　　　　　b. 156
c. 192　　　　　　　　　　　　　　　d. 164

44. If $2^a \times 3^b = 144$, then the value $a^3 - b^4$ is:

a. 36　　　　　　　　　　　　　　　　b. 48
c. 64　　　　　　　　　　　　　　　　d. 54

45. In an institution, 45% of the students are above 10 years of age and of this 64% are boys. If there are 1920 boys above 10 years, then the number of girls above 10 years in the school will be:

a. 880　　　　　　　　　　　　　　　b. 900
c. 1080　　　　　　　　　　　　　　d. 1240

46. When a one-digit number *n* is added to 7106, the sum so obtained is divisible by 9. When this one-digit number *n* is added to 668, the sum so obtained *cannot* be divisible by:

a. 7　　　　　　　　　　　　　　　　b. 5
c. 3　　　　　　　　　　　　　　　　d. 2

47. Four bells toll together at the intervals of 16, 18, 24, 36 minutes. If they start now tolling together, after what time will they next toll together?

a. 2 hours 48 minutes　　　　　　　b. 1 hour 48 minutes
c. 2 hours 12 minutes　　　　　　　d. 2 hours 24 minutes

48. A group of 90 people had provisions for 150 days. After 5 days, 15 people died due to an epidemic. How long will the remaining food last?

a. 180 days　　　　　　　　　　　　b. 165 days
c. 150 days　　　　　　　　　　　　d. 174 days

49. When the fraction represented by the shaded parts in Figure (2) is multiplied by the fraction represented by shaded parts in Figure (1), the product will be equal to:

Figure (1)　　　Figure (2)

a. $\dfrac{3}{32}$ b. $\dfrac{3}{20}$
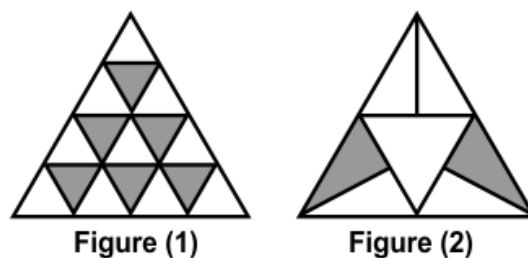
c. $\dfrac{3}{16}$ d. $\dfrac{9}{40}$

50. In the figure shown below, 9 identical squares lie within the rectangle STVU. If the area of the shaded portion is 1216 cm^2, then find the perimeter of rectangle STVU.
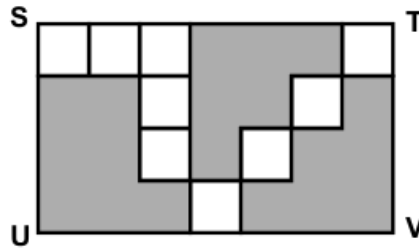
a. 110 cm b. 132 cm

c. 154 cm d. 176 cm

Answer Key

1.	b	2.	b	3.	c	4.	b	5.	d	6.	d	7.	c
8.	c	9.	c	10.	b	11.	b	12.	a	13.	a	14.	d
15.	c	16.	b	17.	c	18.	b	19.	c	20.	c	21.	b
22.	d	23.	d	24.	a	25.	d	26.	a	27.	b	28.	c
29.	b	30.	b	31.	a	32.	c	33.	c	34.	c	35.	c
36.	d	37.	b	38.	c	39.	c	40.	b	41.	d	42.	a
43.	d	44.	b	45.	c	46.	b	47.	d	48.	d	49.	a
50.	d												