HIBA Math Olympiad (HMO)

Sample Paper Grade 6

Pattern and Marking Scheme				
Grade	**Topic / Section**	**NO. of Questions**	**Marks Per Questions**	**Total Marks**
Grade 6	Practical Mathematics	40	1	40
	Achiever's Section	10	2	20
Grade Total		**50**		**60**

The total duration of the exam is 60 minutes. Grade 6 (Age 11–12)

Syllabus

Section 1: Knowing Our Numbers, Whole Numbers, Playing with Numbers, Basic Geometrical Ideas, Understanding Elementary Shapes, Integers, Fractions, Decimals, Data Handling, Mensuration, Algebra, Ratio And Proportion, Symmetry, Practical Geometry.

Achievers Section: Higher Order Thinking Questions - Syllabus as per Section

Each Question is 1 Mark

1. Roman numeral for 498, is

a. CDCXVIII b. CDCXIV c. CDXCVIII d. CDXCVII

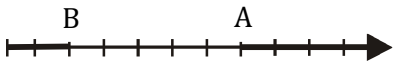
2. Difference between the place values of "3" in 3116365 is

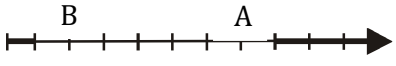
a. 2999700 b. 3000700 c. 2990700 d. 30000

3. What will come in place of "?"

a. 72 b. 84
c. 96 d. 112

4. Which number line correctly represents the numbers less than or equal to B and the numbers greater than or equal to A?

a. 

b. 

c. 

d. 

5. The information in which of the following option is incorrectly matched?

a. Successor of 930 931

b. (Successor of 828) + 1 830

c. Predecessor of 1000 999

d. (Predecessor of 7261) – 1 7260

6. Tarun has 67 small peach trees in his orchard that sprang up from seed. He only has room for a few trees, he has decided to dig them out and divide them equally among his twelve friends. How many peach trees will each of his friends get ?

a. 7 b.12 c. 6 d. 5

7. Which set of numbers lists all the digits that can occupy the blank space in the number 98257_6 such that the number is divisible by 4?

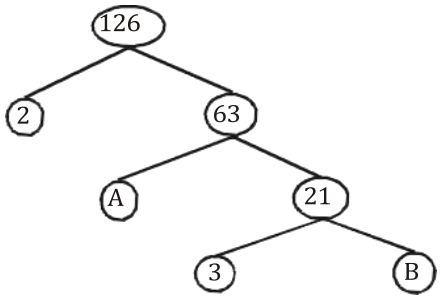
a. {1, 3, 5, 7, 9}

b. {1, 3, 4}

c. {0, 2, 3}

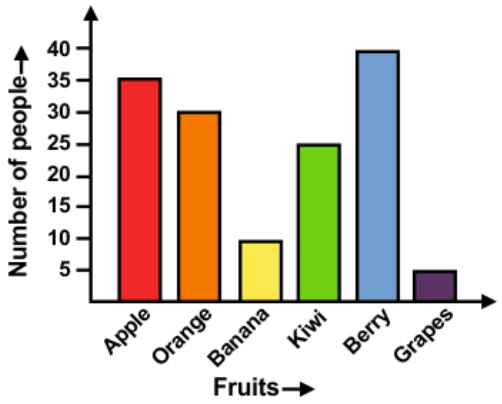
d. {2, 3, 4, 5}

8. What are the respective values of A and B in the given factor tree of the number 126?



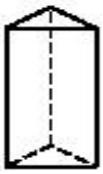
a. 2 and 5 b. 3 and 7 c. 6 and 2 d. none of these

9. The given graph shows the fruit preferences of people. How many more people prefer oranges over bananas?

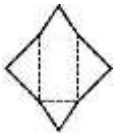


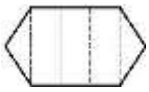
a. 20 b. 15 c. 17 d. 21

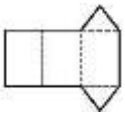
10. Nathan folded and taped a piece of cardboard to form the figure shown below.

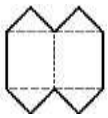


Which of the following nets shows the unfolded figure?

a. 

b. 

c. 

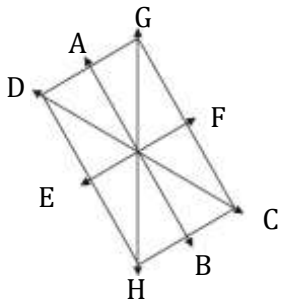
d. 

11. Two regular pentagons of side 5 cm are joined together as shown in the figure.

Find the perimeter of the new figure

a. 35 cm
b. 40 cm
c. 45 cm
d. 50 cm

12. Which two lines segment are NOT lines of symmetry for the rectangle?



a. AB and EF b. AB and DC c. GH and CD d. None of these

13. The value of $-x + [x + \{-x - (x + x)\}]$ is

a. $-x$ b. $-2x$ c. $-3x$ d. $-5x$

14. What must be added to 203 to get a number whose digits are reversed from the given number?

a. 100
b. 99
c. 89
d. 77

15. Which of the following is not a pair of twin primes between 10 and 40?

a. (11, 13)
b. (21, 23)
c. (17, 19)
d. (29, 31)

16. Which of the following fraction is closest to 0?

a. $-\frac{5}{12}$ b. $-\frac{2}{3}$ c $\frac{5}{6}$ d. None of these

17. If the sum of two numbers is 55 and the H.C.F. and L.C.M. of these numbers are 5 and 120 respectively, then what is the sum of the reciprocals of these numbers?

a. 55/601
b. 601/55
c. 11/120
d. 120/11

18. 1/10 of a rod is coloured red, 1/20 orange, 1/30 yellow, 1/40 green, 1/50 blue, 1/60 black and the rest violet. If the length of the violet portion is 12.08 m, then what is the length of the rod?

a. 16 m
b. 18 m

c. 20 m

d. 30 m

19. Which of the following shows 0.56 written in expanded notation?

a. $(5 \times 10) + (6 \times 100)$

b. $(5 \times 0.01) + (6 \times 0.001)$

c. $(5 \times 0.1) + (6 \times 0.01)$

d. None of these

20. The price of calculation has decreased from $ 120 to $ 90. What is the percentage of decrease?

a. 30%

b. 25%

c. 75%

d. 35%

21. Annual incomes of 'A' and 'B' are in the ratio 4:5, respectively. If the income of 'A' increases by 25% and that of 'B' increases by 20%, then what is the new ratio of their incomes respectively?

a. 5:8

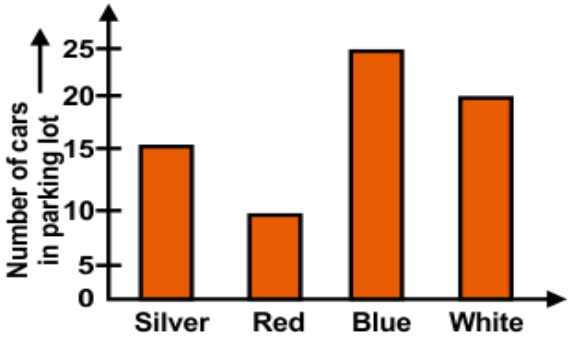
b. 4:7

c. 5:6

d. 6:5

22. Study the bar graph and match the lists:

List I		List II	
P.	Total number of cars in the parking lot is	1.	Blue
Q.	Number of cars which are blue in colour is	2.	25
R.	The least common colour among the cars is	3.	70
S.	The most common colour among the cars is	4.	Red



a. P-2, Q-3, R-1, S-4

b. P-1, Q-2, R-3, S-4

c. P-4, Q-3, R-2, S-1

d. P-3, Q-2, R-4, S-1

23. Which of the following data does not **shows a constant** rate of change.

i.

Cup of milk	Pieces of chocolate made
2	24
4	48
6	72

ii.

Number of pens	Price ($)
6	30
12	60
18	90

iii.

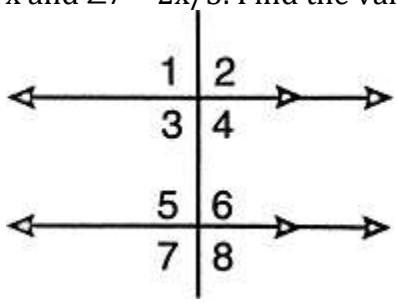
Time	km covered
3 hr.	45
6 hr.	90
12 hr.	180

iv.

Games	Points scored
2	50
4	100
6	150

a. i,ii and iii b. ii and iii c. only (iii) d. None of these

24. In the given figure ∠1 = x and ∠7 = 2x/3. Find the value of ∠5.



a. 36° b. 72°
c. 108° d. 144°

25. Which number when added to 55 × 20 will be equal to the result of 58500 ÷ 50?

a. 50 b. 40 c. 70 d. 90

26. Which word problem could be solved by using the equation $x + 6 = 15$?

a. Mary has 6 more homework problems to solve. If she had a total of 15

problems to solve, how many has she already completed?

b. Mary has completed 15 homework problems. She has 6 more to solve. How many problems did she have for homework?

c. Mary needs to complete 15 more problems for her math homework. She has completed a total of 6. How many problems will she complete for homework?

d. None of these

27. Which of the following expressions correctly represents the prime-factorisation of the number 5670

a. $2 \times 3 \times 3 \times 3 \times 3 \times 5 \times 7$

b. $2 \times 3 \times 5 \times 7$

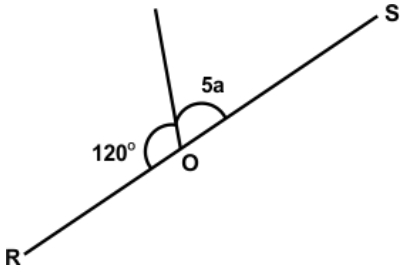
c. $2 \times 2 \times 3 \times 3 \times 5 \times 5 \times 7$

d. None of these

28. The two consecutive prime numbers with difference 2 are called

a. co-primes b. twin primes c. composite d. even

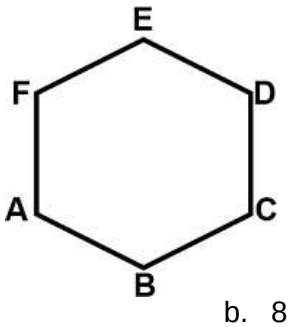
29. Find the value of 'a' in the below figure, given that ROS is a straight line.



a. 60°
b. 48°
c. 12°
d. 6°

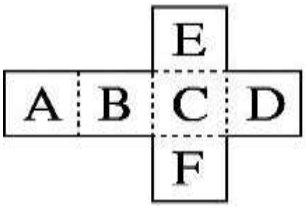
30. A polygon is entirely made up of straight lines only. A hexagon ABCDEF is a six-sided polygon.

How many diagonals are there in the hexagon?



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

31. Sarah folded the pattern below along the dotted lines to form a cube



When folded, which letter will be opposite to letter C?

a. E
b. B
c. F
d. None of these

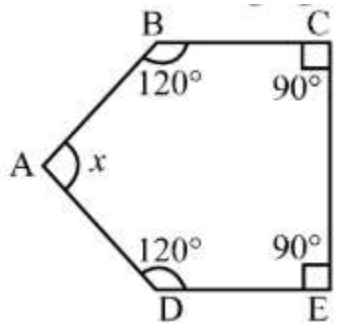
32. Anil bought a bag containing 55 kg of masur dal and a bag containing 77 kg of rajma from a wholesale shop. He wants a container that can measure the quantities of dal in two bags (considering that the container will always be full) when used an exact number of times. What should be the maximum capacity of the container?

a. 30
b. 11
c. 20
d. 21

33. In the given rectangle MNOP, if length is decreased by 3x, then find the new perimeter.

a. (32x - 2) units
b. (30x - 2) units
c. (26x - 2) units
d. (28x - 2) units

34. In the following figure find the value of x



a. 60^o b. 120^o c. 90^o d. 135^o

35. If the length of a paddy field is 100m and breadth is 80 cm. Then the ratio of its breadth to its perimeter is

a. 5 : 4 b. 4 : 5 c. 2 : 9 d. None of these

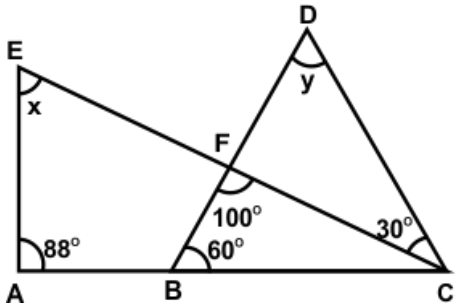
36. Find the cost of carpeting at the rate of 60 per square meter if the length and width of a hall are 50 m and 60 m respectively.

a. 180000 b. 157950 c. 155940 d. 120000

37. If 50% of a number is 20, what is 75% of the number?

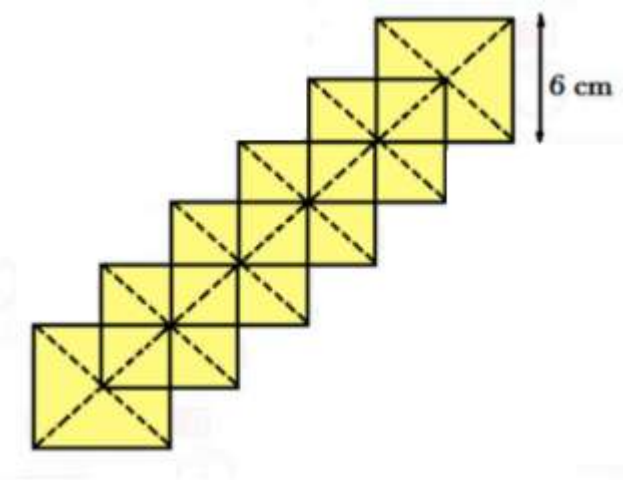
a. 8 b. 15 c. 30 d. 32

38. In the figure shown below, ABC and EFC are straight lines. Find the value of x + y.



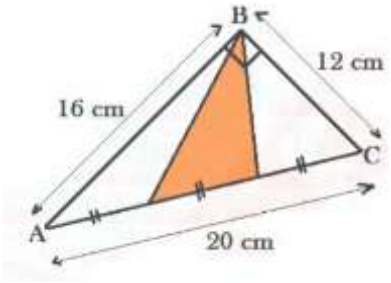
a. 120°
b. 130°
c. 138°
d. 142°

39. The figure below is made up of overlapping squares of sides 6 cm. Find the area of shaded figure. The figure is not drawn to scale



a. 144 sq cm
b. 164 sq cm
c. 171 sq cm
d. 183 sq cm

40. In the figure below ABC is a right -angled triangle. Find the shaded area.



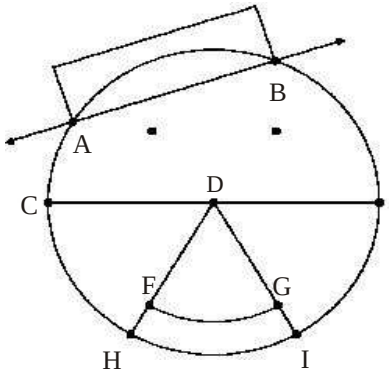
a. 16 sq cm b. 32 sq cm c. 42 sq cm d. 44 sq cm

Each Question is 2 Mark

41. Study the picture of 'Mr Circle, the Crown". Given the following lengths, what would be the length of segment CE?

Segment GI = 10 millimetres

Segment DG = 30 millimeters



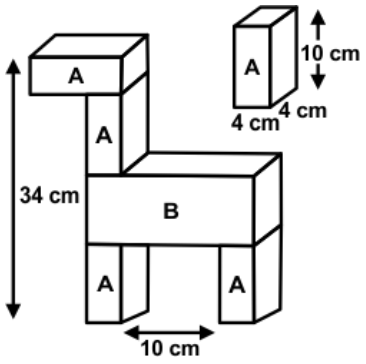
a. 80 millimeters

b. 40 millimeters

c. 60 millimeters

b. d. None of these

42. A few blocks of wood are used to make the shape of a giraffe as shown below. What is the volume of wood used to make the giraffe?



a. 640 cm^2
b. 1260 cm^2
c. 1360 cm^2
d. 1400 cm^2

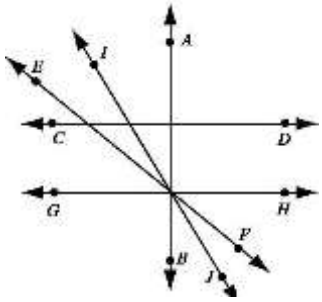
43. Consider the following quotients:

I. 368.39 divided by 17
II. 170.50 divided by 62
III. 875.65 divided by 83

Their correct sequence in decreasing order is:

a. I, III, II
b. II, I, III
c. II, III, I
d. III, I, II

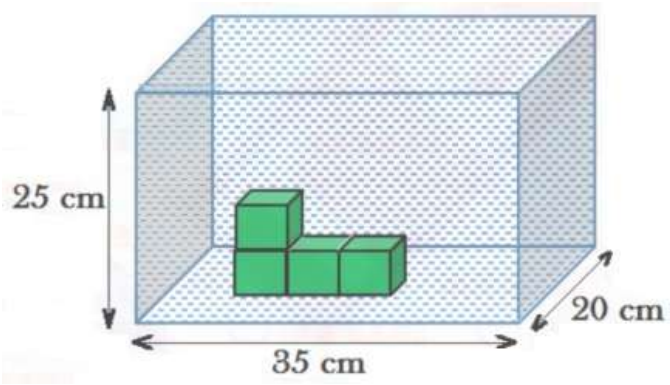
44. In the figure given above which line is parallel to CD and perpendicular to AB



a. IJ
b. GH
c. EF
d. None of these

45. John had container measuring 35 cm by 20 cm by 25 cm. He placed a solid made of 4 identical 5 cm cubes in the tank and then dilled the tank completely with water as shown in the figure below. He then poured out 11387.5 ml of water. what was the

height of the water in the tank in the end?



a. 7.5 cm b. 8.25 cm c. 9.5 cm d. 10.1 cm

46. Find m and n in the given ratios: 48 : 384 = m : 784 = 53 : n

a. m = 35, n = 88
b. m = 98, n = 424
c. m = 26, n = 153
d. m = 82, n = 584

47. Simplify:

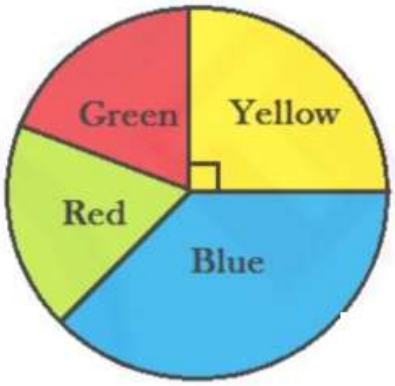
[{(2/3)-2 x (256/625)1/2}-1/2 ÷ ((4/3))-2)3] x (1/0.1)-1 = .

a. 45/37
b. 45/36
c. 46/35
d. 35/46

48. If 63.3605 = 6A + 3/B + 3C + 6/D + 5E, then what is the value of 4A + 7B + 6C + D + 3E.

a. 47.603
b. 4.7603
c. 147.6003
d. 47.6003

49. The pie chart shows the favorite colors of the students in class V1. 1/3 of the pupil like blue and an equal number of pupils like green and red. The rest of pupils like yellow. If 25 pupils like green, how many pupils were there



a. 50 students b. 120 students c. 132 students d. 148 students

50. Match the following:

Column A		Column B	
a.	$[2^9 \times 2^{12}] \div 2^5$	p.	2^{10}
b.	$[2^{19} \times 2^{14}] \div 2^{20}$	q.	2^{13}
c.	$[2^{17} \times 2^{18}] \div 2^{16}$	r.	2^{16}
d.	$[2^6 \times 2^{12}] \div 2^8$	s.	2^{19}

a. (a) - (r); (b) - (p); (c) - (s); (d) - (q)
b. (a) - (r); (b) - (s); (c) - (q); (d) - (p)
c. (a) - (r); (b) - (q); (c) - (s); (d) - (p)
d. (a) - (p); (b) - (q); (c) - (s); (d) - (r)

Answer Key

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