



Unified International
Mathematics Olympiad

UNIFIED INTERNATIONAL MATHEMATICS OLYMPIAD

CLASS - 6
Question Paper Code : 4P114

KEY

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

EXPLANATIONS

MATHEMATICS - 1

01. (B) $98765 \frac{7}{8} + 56789 \frac{3}{4} - 155554 \frac{1}{2}$

$$= 98765 + \frac{7}{8} + 56789 + \frac{3}{4} - 155554 - \frac{1}{2}$$

$$= 1 \frac{1}{8}$$

02. (C) Cost of 1 kg apple = $\frac{\text{Rs. } 425}{5} = \text{Rs. } 85$

\therefore Cost of 8 kg apples = Rs. $85 \times 8 = \text{Rs. } 680$

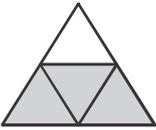
Cost of dozen oranges = $\frac{\text{Rs. } 744}{12} = \text{Rs. } 62$

\therefore Cost of 8 dozen oranges = Rs. $62 \times 8 = \text{Rs. } 496$

Cost of 4 kg mangoes = Rs. 480

\therefore Cost of 8 kg mangoes = Rs. 960

\therefore Cost of (8kg apples + 8 dozen oranges + 8 kg mangoes) = Rs. $680 + \text{Rs. } 496 + \text{Rs. } 960 = \text{Rs. } 2,136$

03. (C) $\frac{242-122}{2} + 1 = 60 + 1 = 61$
04. (C) M, M + 2, M + 4 are prime number then
M = 3
 $\therefore M + 10 = 3 + 10 = 13$
05. (D) $51^3 - 3 \times 51^2 \times 49 + 3 \times 51 \times 49^2 - 49^3$
 $= 1,32,651 - 147 \times 2601 + 153 \times 2401 - 1,17,649$
06. (B) The cost of (3 + 2 + 4) pens + (4 + 3 + 2) pencils + (2 + 4 + 3) erasers
 $= ₹ 53 + ₹ 53 + ₹ 49$
 \therefore The cost of 9 pens + 9 pencils + 9 erasers
 $= ₹ 162$
 \therefore cost of one pen + one pencil + one eraser
 $= ₹ \frac{162}{9} = ₹ 18$
07. (D) 34
 $1 + 2 = 3$
 $2 + 3 = 5$
 $3 + 5 = 8$
 $5 + 8 = 13$
 $8 + 13 = 21$
 $13 + 21 = 34$
08. (C) 
Option 'C' represents $\frac{3}{4}$
09. (C) $26 \times 8 = 208$
10. (C) $LHS = \frac{(1 \times 2 \times 3 \times \dots \times 9)(10 \times 11 - 10)}{1 \times 2 \times 3 \times \dots \times 9}$
 $= 110 - 10$
 $= 100$
11. (D) odd number \times odd number \times odd number
 $=$ odd number
12. (C) Between 45° & 90°

13. (D) Area of bigger rectangle
 $= 28 \text{ cm} \times (12 + 8) \text{ cm} = 560 \text{ cm}^2$
Area of smaller rectangle $= 8 \text{ cm} \times (28 \text{ cm} - 9 \text{ cm} - 5 \text{ cm})$
 $= 8 \text{ cm} \times 14 \text{ cm} = 112 \text{ cm}^2$
Area of shaded region $= 560 \text{ cm}^2 - 112 \text{ cm}^2 = 448 \text{ cm}^2$
14. (C) Factors of 90 are
1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90
 $\therefore 6 - 3 = 3$ and $9 - 6 = 3$
15. (C) A regular pentagon has '5' lines of symmetry
16. (A) Required number $= 90 - 75 = 15$
17. (D) If the arms of angle are extended then the angle does not change
18. (A) Given $lb = 375 \text{ cm}^2$
 $25 \text{ cm} \times b = 375 \text{ cm}^2$
 $b = \frac{375 \text{ cm}^2}{25 \text{ cm}}$
 $= 15 \text{ cm}$
Perimeter $= 2(l + b) = 2(25 \text{ cm} + 15 \text{ cm})$
 $= 80 \text{ cm}$
19. (D) LCM of 2, 3, 4, 5 = 60
 $\frac{1}{2} = \frac{30}{60}, \frac{2}{3} = \frac{40}{60}$
 $\frac{3}{4} = \frac{45}{60}, \frac{4}{5} = \frac{48}{60}$
 $\frac{4}{5}$ is the greatest fraction.
20. (A) $LHS =$
 $\frac{1}{3 \times 5} + \frac{1}{5 \times 7} + \frac{1}{7 \times 9} + \frac{1}{9 \times 11} + \frac{1}{11 \times 13} + \frac{1}{13 \times 15}$
 $= \frac{2}{2} \left[\frac{1}{3 \times 5} + \frac{1}{5 \times 7} + \frac{1}{7 \times 9} + \frac{1}{9 \times 11} + \frac{1}{11 \times 13} + \frac{1}{13 \times 15} \right]$
 $= \frac{1}{2} \left[\frac{2}{3 \times 5} + \frac{2}{5 \times 7} + \frac{2}{7 \times 9} + \frac{2}{9 \times 11} + \frac{2}{11 \times 13} + \frac{2}{13 \times 15} \right]$

$$= \frac{1}{2} \left[\frac{1}{3} - \frac{1}{5} + \frac{1}{5} - \frac{1}{7} + \frac{1}{7} - \frac{1}{9} + \frac{1}{9} - \frac{1}{11} + \frac{1}{11} - \frac{1}{13} + \frac{1}{13} - \frac{1}{15} \right]$$

$$= \frac{1}{2} \left[\frac{1}{3} - \frac{1}{15} \right]$$

$$= \frac{1}{2} \left[\frac{5-1}{15} \right]$$

$$= \frac{1}{2} \times \frac{4}{15} = \frac{2}{15}$$

21. (D) 2016 is divisible by 3 & 9
 (\therefore sum of digits = $2 + 0 + 1 + 6 = 9$)

$$\begin{array}{r} 224 \overline{) 2016} \quad (9 \\ \underline{2016} \\ 0 \end{array}$$

$$\begin{array}{r} 27 \overline{) 2016} \quad (74 \\ \underline{189} \\ 126 \\ \underline{108} \\ 18 \end{array}$$

\therefore 27 is not a factor of 2016.

22. (A) Required angle is a acute angle



23. (B) $(1 + 2 + 3 + \dots + 49) + (50 + 51 + 52) + (53 + \dots + 100)$

$$= 1225 + 153 + 3672$$

$$= 5050$$

24. (D) $\left(\frac{24}{7} \times \frac{14}{8} - \frac{9}{8} \times \frac{16}{3} \right) = \left(\frac{24}{7} \times \frac{14}{8} - \frac{9}{8} \times \frac{16}{3} \right)$

$$= (6 - 6) = 0$$

$$\therefore \left(\frac{2}{3} \times \frac{4}{5} - \frac{5}{6} \times \frac{7}{8} - \frac{9}{10} \times \frac{11}{12} + \frac{13}{14} \times \frac{15}{16} \right) \times 0 = 0$$

25. (D) Perimeter of plot = $2(12 \text{ m} + 15 \text{ m})$
 $= 54 \text{ m}$
 Cost of fencing the plot = $54 \times \text{Rs. } 14 =$
 $\text{Rs. } 756 = [10(5) + 4] \times 14 = \text{₹}756$

26. (C) 

Total length = $25 \text{ cm} + 5 \text{ cm} + 3 \text{ cm} = 33 \text{ cm}$

Breadth = 5 cm

Area of the paper before it was folded

$$= 33 \text{ cm} \times 5 \text{ cm} = 165 \text{ cm}^2$$

27. (B) $61 + 62 + 63 = 186$
 \therefore Largest number = 63
28. (C) Perimeter of the rectangle = $2(l + b)$
 $= 2 \left(77 \frac{3}{4} + 72 \frac{1}{4} \right)$
 $= 2 \times 150 \text{ mts}$
 $= 300 \text{ mts.}$
29. (C) $(100 - 99) + (98 - 97) + \dots + (17 - 13) + (12 - 11)$
 $= 1 + 1 + \dots + 1$
 $45 \text{ times} = 45$
30. (D) Through the given initial point we can draw infinite rays

MATHEMATICS - 2

31. (A, B, C, D)

$$\begin{array}{r} 4 \overline{) 35} \quad (8 \\ \underline{32} \\ 3 \end{array}$$

\therefore 98765435 is divided by 4 leaves a remainder 3

Similarly option B, C and D also divided by 4 leaves a remainder 3.

32. (A, B, D)

The product of two odd numbers is odd
 $\therefore 3 \times 5 = 15$

The product of two even numbers is even
 $\therefore 2 \times 4 = 8$

The sum of two even numbers is even
 $\therefore 8 \times 10 = 18$

33. (A, B, C, D)

All options areas are 36 cm^2

34. (A, B, C, D)

All options are factors of 36,036

35. (C, D)

1, 3, 43, & 129 are factors of 129

129 is a composite number.

1, 7, 17 & 119 are factors of 119

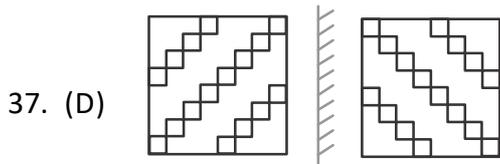
Hence 119 is composite number.

101 & 107 are prime numbers.

REASONING

36. (D) Here, the capital letters are D, F, H, J, L, N, P, R, T, V, X, Z. The third day from monday will be thursday and code will be THuRsDay.

Hence, the answer is THuRsDay.



38. (B) Option A : ATES → EAST

Option B : EWSN → NEWS

Option C : HONRT → NORTH

Option D : EWTS → WEST

39. (C) $\frac{12 + 18 + 30}{10} = 6$

$$\frac{16 + 24 + 40}{10} = 8$$

Similarly, $\frac{45 + 18 + 27}{10} = 9$

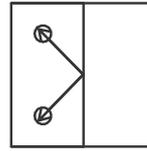
40. (B) o A → A is vowel

& B → B is consonant

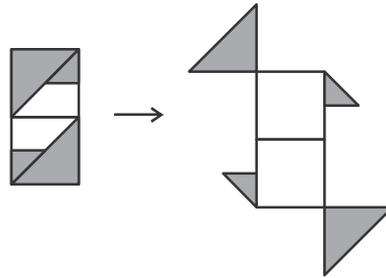
@ C → C is consonant

% D → D is consonant

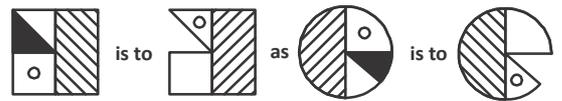
41. (C)



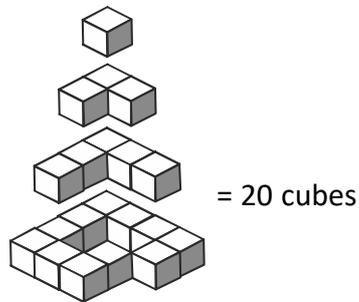
42. (A)



43. (D)



44. (B)



45. (B) $3 \text{ (spiral)} = 21$

$$\text{(spiral)} = 7$$

$$2 \text{ (star)} + 7 = 27$$

$$2 \text{ (star)} = 27 - 7 = 20$$

$$2 \text{ (star)} = 20$$

$$\text{(star)} = 10$$

$$10 - \text{(circle with slash)} = 4$$

$$\text{(circle with slash)} = 10 - 4 = 6$$

$$\text{(circle with slash)} + \text{(spiral)} \times \text{(star)} = 6 + 7 \times 10$$

$$6 + 70 = 76$$

CRITICAL THINKING

46. (D) In option(D) the taps are placed at the lowest position hence having the maximum pressure.

47. Delete

48. (D) Top row sum = $7 + 5 + 4 + 2 + 8 + 3 + 2 = 31$

Bottom row sum = $4 + 3 + 5 + 5 + 7 + 7 + 4 = 35$

Difference = $35 - 31 = 4$

To balance, the top must increase by 2 and the bottom must decrease by 2.

When card G is turned, the top gains 2 and the bottom loses 2.

New top sum: $31 + 2 = 33$

New bottom sum: $35 - 2 = 33$

Both sums become equal.

49. (B) Floors: 2, 3, 4, 5

Suma lives on 5th floor.

Artist lives on the lowest floor ? 2nd floor.

Doctor is one floor above engineer and one below singer, so:

Engineer = 2nd, Doctor = 3rd, Singer = 4th.

Remaining floors for Meghana, Nikita, Pavitra: 2, 3, 4.

Given: Nikita < Meghana < Pavitra.

Only possible order:

Nikita → 2nd

Meghana → 3rd

Pavitra → 4th

50. (A)

DAY	MON	TUE	WED	THUR	FRI
SHOES	BLUE	BLACK	BROWN	GREY	BLUE

He wears black only on Tuesday

He wears blue on Friday

Brown on a day just before grey

Blue on 2 days

THE END
