



Unified International
Mathematics Olympiad

UNIFIED INTERNATIONAL MATHEMATICS OLYMPIAD (UPDATED)

CLASS - 6

Question Paper Code : 40119

KEY

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

EXPLANATIONS

MATHEMATICS

01. (B) LCM of 4, 5, 6, 7, 8 = 840 seconds = 14 minutes

02. (B) $1 + 2 = 3$, $2 + 3 = 5$, $3 + 5 = 8$, $21 + 34 = 55$

03. (C)
$$\begin{array}{r} 7 \overline{) 86,409(12344} \\ \underline{7} \\ 16 \\ \underline{14} \\ 24 \\ \underline{21} \\ 30 \\ \underline{28} \\ 29 \\ \underline{28} \\ 1 \end{array}$$

$7 - 1 = 6$ to be added

$$\begin{array}{r}
 04. (B) \quad 2 \overline{) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10} \\
 \underline{2} \\
 2 \\
 \underline{2} \\
 3 \\
 \underline{3} \\
 5 \\
 \underline{5} \\
 1, 1, 1, 1, 1, 1, 1, 1, 1, 1
 \end{array}$$

Required LCM

$$= 2 \times 2 \times 3 \times 5 \times 7 \times 2 \times 3 = 2520$$

05. (C) 12321 is the palindrome number.

06. (D) 71 and 73 are the pair of twin primes

$$\begin{aligned}
 07. (B) \quad 6 + 6 - 6 \times 6 + 6 \div 6 &= 12 - 36 + \frac{6}{6} \\
 &= -24 + 1 \\
 &= -23
 \end{aligned}$$

08. (D) Given $2(l + b) = 170$

$$l + b = \frac{170}{2} \text{ m} = 85 \text{ m}$$

$$50 \text{ m} + b = 85 \text{ m}$$

$$b = 85 \text{ m} - 50 \text{ m} = 35 \text{ m}$$

$$\therefore \text{Area} = l \times b$$

$$= 50 \text{ m} \times 35 \text{ m}$$

$$= 1750 \text{ m}^2$$

09. (A) Sum of three prime numbers is even then
Even + odd + odd result is even

$$\therefore \text{Smallest prime} = 2$$

$$10. (C) \quad 1 - 2 = -1, 1 - 2 + 3 - 4 = -2$$

$$\therefore 1 - 2 + 3 - 4 + \dots + 99 - 100 = -50$$

11. (B) Greatest 5 digit number using the digits 8, 7, 0, 1 = 88710

Smallest 5 digit number using the digits 8, 7, 0, 1 = 10078

$$\therefore \text{required difference} = 88710 - 10078 = 78632$$

$$\begin{aligned}
 12. (B) \quad \text{LHS} &= \frac{1}{3} \times \frac{2}{4} \times \frac{3}{5} \times \frac{4}{6} \times \dots \times \frac{18}{20} \times \frac{19}{21} \times \frac{20}{22} \\
 &= \frac{2}{21 \times 22} = \frac{1}{231}
 \end{aligned}$$

$$13. (D) \quad \text{Divisor} = 5 \text{ times remainder} = 46 \times 5 = 230$$

$$\text{Quotient} = \frac{\text{Divisor}}{10} = 23$$

$$\begin{aligned}
 \therefore \text{Dividend} &= \text{Divisor} \times \text{Quotient} + \text{Remainder} \\
 &= 230 \times 23 + 46 = 5336
 \end{aligned}$$

$$\begin{array}{r}
 14. (C) \quad 8 \overline{) 789} (98 \\
 \underline{72} \\
 69 \\
 \underline{64} \\
 5
 \end{array}$$

$\therefore$ 123456789 is divided by 8 then the remainder = 5

15. (B) Area of the shaded region

$$= \frac{\text{Total area}}{2} = 50 \text{ cm}^2$$

16. (C) Charge for first km = ₹ 25

Charge of each next km = ₹ 18

$\therefore$ Total charge of a trip of 10 km

$$= ₹ 25 + ₹ 18 \times 9$$

$$= ₹ 25 + ₹ 162$$

$$= ₹ 187$$

$$17. (A) \quad \frac{2023 \times 2023 - 2024 \times 2024}{4047}$$

$$= \frac{40,92,529 - 40,96,576}{4047}$$

$$= \frac{-4047}{4047} = -1$$

18. (D) Use distributive property to simplify

$$555 \times 193 - 555 \times 93$$

$$= 555 \times (193 - 93)$$

$$= 555 \times 100 = 55,500$$

19. (D) Cost of 2 dozen pens = Rs. 112

$$\Rightarrow \text{Cost of 1 dozen pen} = \text{Rs.} \left(\frac{112}{2} \right) = \text{Rs.} 56$$

$$\Rightarrow \text{Cost of 12 dozen pens} = 56 \times 12 = \text{Rs.} 672$$

Since, cost of 5 dozen bottles = Cost of 12 dozen pens

$$\Rightarrow \text{Cost of 60 bottles} = \text{Rs.} 672$$

$$\therefore \text{Cost of 10 bottles} = \frac{672}{60} \times 10 = \text{Rs.} 112$$

20. (B) $-12 - (-28) = (-12) + (+28) = +16$

21. (C) $l = 900 \text{ m}, b = 700 \text{ m}$

Perimeter = $2(900 + 700) \text{ m}$

= $2(1600) \text{ m} = 3200 \text{ m}$

Perimeter for 3 rounds fence

= $3(3200) \text{ m} = 9600 \text{ m}$

$\therefore$ Total amount spent = $9600 \times ₹ 8$

= ₹ 76,800

22. (A) 987789 is the required number

required number = $-150 - 67 = -217$

23. (D) required number = $-150 - 67$

= -217

-217 should be added to 67 to get -150 .

24. (C) No. of adult passengers = 85

No. of children = 35

Their difference = $85 - 35 = 50$

$\therefore$ Adult passengers on board were 50 more than the children

25. (D) $\frac{5}{15} + \frac{5}{15} + \frac{1}{15} = \frac{11}{15}$

$\frac{2}{15} + \frac{4}{15} + \frac{5}{15} = \frac{11}{15}$

Hence $\frac{11}{15} - \frac{1}{15} - \frac{2}{15} = \frac{8}{15}$

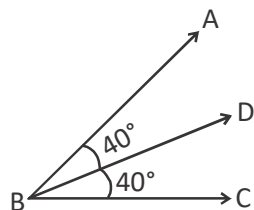
26. (C) Since P is the predecessor of q

So $p = q - 1 \therefore p - q = -1$

eg: 7 is the predecessor of 8

$\therefore 7 - 8 = -1$.

27. (B)



Given BD is the bisector of $\angle ABC$

$\therefore \angle ABD = \frac{80^\circ}{2} = 40^\circ$

28. (B) Lcm of 3,6,8,14 = 168

$\frac{7}{8} = \frac{7}{8} \times \frac{21}{21} = \frac{147}{168}, \frac{5}{6} = \frac{5}{6} \times \frac{28}{28} = \frac{140}{168}$

$\frac{2}{3} = \frac{2}{3} \times \frac{56}{56} = \frac{112}{168}, \frac{9}{14} = \frac{9}{14} \times \frac{12}{12} = \frac{108}{168}$

= $\frac{108}{168} < \frac{112}{168} < \frac{140}{168} < \frac{147}{168}$

i.e $\frac{9}{14} < \frac{2}{3} < \frac{5}{6} < \frac{7}{8}$

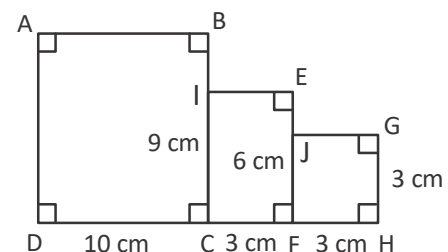
29. (A) 54321×99999

= $54321 \times (100000 - 1)$

$5432100000 - 54321$

$$\begin{array}{r} 5432100000 \\ - \quad 54321 \\ \hline 5432045679 \end{array}$$

30. (D)



Area of ABCD = $10 \text{ cm} \times 9 \text{ cm}$

= 90 cm^2

Area of CF EI = $6 \text{ cm} \times 3 \text{ cm}$

= 18 cm^2

Area of FH GJ = $3 \times 3 \text{ cm}^2$

= 9 cm^2

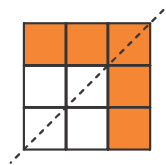
Total area = $90 \text{ cm}^2 + 18 \text{ cm}^2 + 9 \text{ cm}^2$

= 117 cm^2

MATHEMATICS - 2

31. (A,C,D)

Option (C) has line symmetry



A,C and D are having line symmetries.

32. (A,C,D)

Factors of area 1,2,3 & 6

$$\therefore 1 + 2 + 3 + 6 = 12 = 2 \times 6$$

$\therefore$ '6' is a perfect factor of 496 are

1, 2, 4, 16, 31, 62, 124, 248, 496

$$\therefore 1 + 2 + 4 + 8 + 16 + 31 + 62 + 124 + 248 + 496$$

$\therefore$ 496 is a perfect number.

Factor of 28 are 1, 2, 4, 7, 14, 28

$$1 + 2 + 4 + 7 + 14 + 28 = 56 = 2 \times 28$$

$\therefore$ 28 is a perfect number

33. (A,B,C,D)

$$\begin{array}{r} 51 \overline{) 51051} \\ \underline{51} \\ 051 \\ \underline{51} \\ 0 \end{array}$$

$$51051 = 51 \times 1001$$

$$\therefore 3 \times 17 \times 13 \times 11 \times 7$$

Factor of 51,051

34. (A,B,C,D)

All options are prime numbers

35. (A,B,C)

$$\begin{array}{r} 517 \overline{) 12925} \\ \underline{1034} \\ 2585 \\ \underline{2585} \\ 0 \end{array}$$

$$\therefore \frac{12925}{517} = 25$$

which is an odd number

Option 'B' odd number - even number
= odd number.

Option 'C' The product of two odd numbers is odd

Option The product of one odd number and one even number is even.

REASONING

36. (D) From sentences: "good listener become aveena home" $\rightarrow$ codes "ye hi to na". "home is very famous" $\rightarrow$ "to to ha ka". The only code common to the two containing "home" is "to", so "to" = home. In the third sentence the remaining words are "is", "very", "famous" mapped to "to", "ha", "ka" (with one code repeated). Since "is" appears in the first sentence but none of the first-sentence codes match "ha" or "ka", the remaining reasonable assignment is "ha" = "very" (and "ka" = "famous").

37. (D) Pattern check :

$$\text{Option (A) : } \times 2, \times 3 \rightarrow 2 \rightarrow 4 \rightarrow 12$$

$$\text{Option (B) : } \times 2, \times 3 \rightarrow 5 \rightarrow 10 \rightarrow 30$$

$$\text{Option (C) : } \times 2, \times 3 \rightarrow 7 \rightarrow 14 \rightarrow 42$$

$$\text{Option (D) : } \times 2, \times 4 \rightarrow 9 \rightarrow 18 \rightarrow 72$$

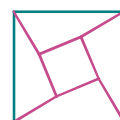
38. (B) Here, the number obtained is by multiplying by 3 and then add 3 in it i.e.,

$$15 \times 3 + 3 = 48$$

$$48 \times 3 + 3 = 147$$

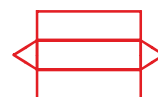
$$\text{Similarly, } 147 \times 3 + 3 = 444$$

Hence, 444 is the answer



39. (C)

40. (A) N2676S

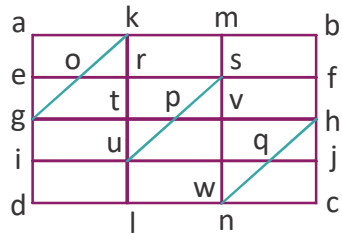


41. (A)

42. (A) The first, 2nd and 3rd letters of the first group are moved one, three and five steps forward respectively to obtain the corresponding letters to the 2nd group. Thus the answer is (A).

43. (A) Clearly, b occurs twice.

44. (D) The figure, in question may be labeled as shown in following figure.



There are 12 triangles in the figure, namely $\triangle EOG$, $\triangle AGK$, $\triangle KOR$, $\triangle KGT$, $\triangle TUP$, $\triangle RUS$, $\triangle SPV$, $\triangle SUW$, $\triangle WNQ$, $\triangle VNH$, $\triangle HQJ$ and $\triangle HNC$.

45. (B)



CRITICAL THINKING

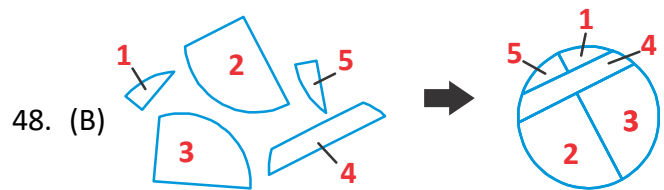
46. (D) 1 day = 24 hrs.

$$\frac{100}{24} = 4 \text{ days } 4 \text{ hr remaining.}$$

He came back 12 O' clock. So, he leave home to attend the camp is

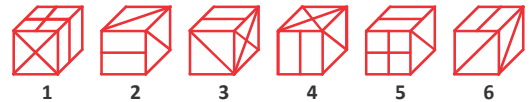
$$12 - 4 = 8 \text{ am.}$$

47. (C) In order to level the sea-saw, the person Q should shift rightwards.



48. (B)

49. (A) From the given net of the cube, we have following cubes formed.



So the figures (3) and (5) are not correct in the problem.

50. (B) According to the first two statements, Tommy weighs the most and Jimmy weighs the least.

The End