



UNIFIED INTERNATIONAL MATHEMATICS OLYMPIAD

CLASS - 6


Question Paper Code : UM9274

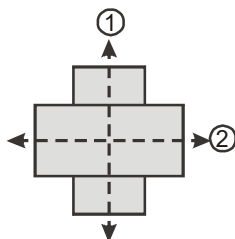
KEY

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

EXPLANATIONS

MATHEMATICS - 1 (MCQ)

01. (C) The number of lines of symmetry for the given figure  is 2, as shown



02. (B) All the three bulbs glow at once at 8 a.m. The time when they glow simultaneously again
 = L.C.M. (24, 48, 54) seconds
 = 216 seconds
 = 3 minutes 36 seconds
 \therefore The time when the three bulbs glow together again is at 8:03:36 a.m.

03. (B) $LHS = 1 + 2 + 3 + 4 - 5 - 7 - 8 + 9 + 10 + 11 + 12 - 13 - 14 - 15 - 16 + \dots + 2019$
 $= (1 + 2 + 3 + 4 - 5 - 6 - 7 - 8) + (10 + 11 + 12 - 13 - 14 - 15 - 16) + \dots + (2009 + 2010 + 2011 + 2012 - 2013 - 2014 - 2015 - 2016) + 2017 + 2018 + 2019$
 $= \underbrace{(-16) + (-16) + (-16) + \dots + (-16)}_{252 \text{ times}} + 6054$
 $= -16 \times 252 + 6054$
 $= -4032 + 6054$
 $= 2022$

04. (A) Area of inner square = $(45m)^2$
 $= 2025 m^2$
 Area of outer square = $(2025 + 475) m^2$
 $= 2500 m^2$
 $\therefore S^2 = (50 m)^2$
 Side of outer square = 50 m
 Width = $50 m - 45 m = 5 m$

05. (B) In the given figure P, Q lie on the same line, but o lie on other line. Points not lying on the same line are called non-collinear points

06. (A) Area of a photo = $12 \times 18 = 216 \text{ sq. cm}$
 Cost of frame per square centimetre = ₹ 1.20
 \therefore Cost of framing = $216 \times ₹ 1.20$
 $= ₹ 259.20$

07. (B) M & M + 1 are prime means both numbers must be 2 & 3
 $\therefore m = 2 \text{ \& } m + 1 = 3$
 $M(M - 2) + 1 = 2(2 - 2) + 1 = 0 + 1 = 1$
 Which is neither prime nor composite.

08. (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 required difference = $88710 - 10078$
 $= 78632$

09. (A) If $a = 4$ & $b = 3$ then LCM of 4 & 3 is 12
 If $b = 3$ & $c = 5$ then LCM of 3 & 5 is 15
 \therefore LCM of a & c is 20 which is the least value

(OR) $LCM \text{ of } a \text{ \& } c = \frac{LCM \text{ of } (a \text{ \& } b) \text{ \& } (b, c)}{HCF \text{ of } (a, b) \text{ and } (b, c)}$
 $= \frac{60}{3} = 20$

10. (C) $LHS = 190 - [18 - \{8 - (16 - 4) \div 3\}]$
 $= 190 - \left[18 - \left\{ 8 - \frac{12}{3} \right\} \right]$
 $= 190 - 14$
 $= 176$

11. (A) * is replaced by '2' so the given number is divisible by 11.

12. (B) Given the ratio of questions = 2 : 2 : 1
 $= 2x : 2x : x$

Total marks = $2x \frac{1}{2} + 2x \times 1 + x \times 2$
 $\Rightarrow x + 2x + 2x = 100$
 $5x = 100$

No. of two mark questions = $x = 20$

13. (D) Karan, Rahim, Kiran marbles ratio = 2 : 5 : 7 = $2x : 5x : 7x$
 Total marbles = $2x + 5x + 7x = 14x$
 Given $14x = 280$
 $x = 20$

Difference of marbles between kiran and kara = $7x - 2x = 5x$
 $= 5 \times 20 = 100$

14. (A)
$$\begin{array}{r|l} 5 & 20, 25, 35, 40 \\ 2 & 4, 5, 7, 8 \\ 2 & 2, 5, 7, 4 \\ & 1, 5, 7, 2 \end{array}$$

\therefore L.C.M = $5 \times 2 \times 2 \times 5 \times 7 \times 2 = 1400$
 $20 - 14 = 25 - 19 = 35 - 29$
 $= 40 - 34 = 6$
 \therefore The required number = L.C.M - 6
 $= 1400 - 6 = 1394$

15. (B) $A = 5^{\text{th}}$ composite number = 10

$B = 6^{\text{th}}$ prime number = 13

$$\therefore A - B = 10 - 13 = -3$$

16. (D) From options

$$17^2 + 24^2 + 34^2 = 289 + 576 + 1156 = 2021$$

17. (A) Given

$$2(l + b) = 80 \text{ m}$$

$$l + b = \frac{80\text{m}}{2} = 40\text{m}$$

$$l + 15 \text{ m} = 40 \text{ m}$$

$$l = 40 - 15\text{m} = 25\text{m}$$

$$\text{Area} = l \times b = 25 \times 15 = 375 \text{ m}^2$$

18. (B) Required number = $10x + y$

19. (A) Perimeter of triangle

$$= 10 \text{ cm} + 15 \text{ cm} + 17 \text{ cm} = 42 \text{ cm}$$

$$\text{Option 'A' perimeter} = 2(l + b)$$

$$= 2(15 \text{ cm} + 6 \text{ cm}) = 2 \times 21 \text{ cm} = 42 \text{ cm}$$

20. (D) $\frac{6}{150} = \frac{2}{50} \times \frac{2}{2} = \frac{4}{100} = 0.04$

21. (C) $6 \times \frac{2}{3} \times \frac{3}{2} = 6$

22. (C) $\frac{4}{15} = 0.266$

$$\frac{5}{17} = 0.294 \quad \frac{10}{33} = 0.\overline{30}$$

$$\frac{8}{27} = 0.296 \quad \frac{4}{15} < \frac{5}{17} < \frac{8}{27} < \frac{10}{33}$$

23. (B) $\text{☺} \text{☺} \text{☹} = 10 + 10 + 5 = 25$

24. (B) Let the capacity of the container be x litres

$$\therefore \frac{3}{4}x = 12 \text{ litres}$$

$$x = 12 \text{ litres} \times \frac{4}{3} = 16 \text{ litres}$$

25. (B) Cost of one kg wheat = $\frac{\text{₹ } 550}{50} = \text{₹ } 11$

Cost of 11 kgs wheat

$$= \text{₹ } 11 \times 11 = \text{₹ } 121$$

26. (C) H.C.F (4956, 3894) = 354

Here 354 are the maximum daily wages.

The officer was appointed on contract money of ₹ 4956 = 354×14 , i.e., he was appointed for 14 days. But he was paid ₹ 3894 = 354×11 , i.e., he was present for 11 days. Hence, he was absent for 3 days

27. (B) Given, $x = 64$

$$x^2 + 12x + 36$$

$$= (64)^2 + 12(64) + 36 = 4096 + 768 + 36 = 4900$$

28. (B) HCF of 200 & 80 is 40

\therefore Number of square pieces

$$= \frac{200 \times 80}{40 \times 40} = 10$$

29. (B) Successor of least 5 digit number

$$= 10000 + 1 = 10,001$$

Predecessor of greatest 3 digit number

$$= 999 - 1 = 998$$

$$\text{Difference} = 10,001 - 998 = 9003.$$

30. (A) $8937 \times 648 + 8937 \times 122 + 8937 \times 230$

$$= 8937 [648 + 122 + 230]$$

$$= 8937 \times 1000$$

$$= 8937000$$

\therefore Answer is option (A).

MATHEMATICS - 2 (MAQ)

31. (B,C,D) $13 + 17 = 7 + 23 = 11 + 19 = 30$

$$\text{and } 13 \times 17 = 221, 7 \times 23 = 161$$

$$11 \times 19 = 209.$$

32. (A, B, D) It can be 9 black and 1 white marbles (OR)

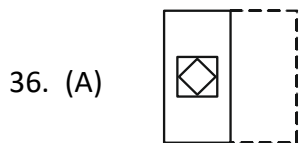
It can be 7 black and 3 white marbles.

It can be 8 black and 2 white marbles.

33. (A, B, C) A triangle has 3 sides, 3 vertices & 3 angles

34. (C, D) Let the number be
 $100x + 10y + z \times 1$
 Given $100x + 10y + z - (x + y + z)$
 $= 99x + 9y = 9(11x + y)$
 \therefore It is divisible by 9
 It is also divisible by 3
35. (A, C, D) The sum of two prime numbers need not be an even number because $2 + 3 = 5$

REASONING



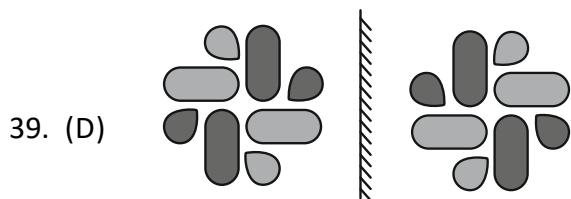
37. (B) $1^2 = 1 = 1NE$ $4^2 = 16UR$
 $2^2 = 4 = 4WO$ $5^2 = 25VE$
 $3^2 = 9 = 9EE$ $6^2 = 36IX$

38. (C)

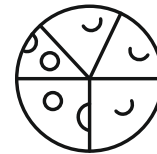
1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M

Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

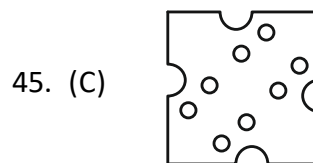
8 must be replaced with symbols.
 $26 - 8 = 18.$




40. (B) First letter represents shaded or (.) in combination of 3 circles 2nd letter represents \times marks i.e., PS is the code for last figure.
41. (A) Given analogy is a series of prime Numbers leaving 1 prime number in between. So, the correct answer is 29.
42. (C) Observe the symbols in each of the shapes and approximate it to a circle.



43. (C) Rule is $a \star b = (a + b)^2$
 i.e., $7 \star 1 = (7 + 1)^2 = 8^2 = 64$
 and $8 \star 4 = (8 + 4)^2 = 12^2 = 144$
 Similarly $3 \star 9 = (3 + 9)^2 = 12^2 = 144$
44. (C) In all other figures, the number of 'V' shaped elements inscribed in the polygon are equal to the number of sides of polygon (D).



CRITICAL THINKING

46. (C)  should be the 168th symbol in given pattern.
47. (B) Boxing, Tennis doubles, Basket ball, Hockey
48. (B) Hands of a clock point in opposite directions is 11 times every 12 hrs.
 So, in a day the hands point in the opposite direction 22 times.
49. (A) 1

