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UNIFIED COUNCIL OLYMPIADS

UIMO
Unified International Mathematics Olympiad

UNIFIED INTERNATIONAL MATHEMATICS OLYMPIAD (UPDATED)

CLASS - 6

Question Paper Code : UM9274

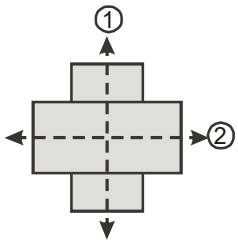
KEY

1	2	3	4	5	6	7	8	9	10
C	B	B	C	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	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

∴ 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 + ... 2019

= (1 + 2 + 3 + 4 – 5 – 6 – 7 – 8) + (10 + 11 + 12 – 13 – 14 – 15 – 16) + ... + (2009 + 2010 + 2011 + 2012 – 2013 – 2014 – 2015 – 2016) + 2017 + 2018 + 2019

$= \underbrace{(-16)+(-16)+(-16).....+(-16)}_{252 \text{ times}} + 6054$

= –16 × 252 + 6054

= –4032 + 6054

= 2022

04. (C) Area of inner square = $(45m)^2$

= 2025 m^2

Area of outer square = (2025 + 475) m^2

= 2500 m^2

∴ $S^2 = (50\ m)^2$

Side of outer square = 50 m

Width = $\frac{50\,m - 45\,m}{2} = \frac{5\,m}{2} = 2.5$

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 × 18 = 216 sq. cm

Cost of frame per square centimetre

= ₹ 1.20

∴ Cost of framing = 216 × ₹ 1.20

= ₹ 259.20

07. (B) M & M + 1 are prime means both numbers must be 2 & 3

∴ m = 2 & 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

∴ 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

∴ LCM of a & c is 20 which is the least value

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

= $\frac{60}{3}$ = 20

10. (C) LHS = 190 – [18 – {8 – (16 – 4) ÷ 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 × 20 = 100

14. (A)

5	20, 25, 35, 40
2	4, 5, 7, 8
2	2, 5, 7, 4
	1, 5, 7, 2

∴ L.C.M = 5 × 2 × 2 × 5 × 7 × 2 = 1400

20 – 14 = 25 – 19 = 35 – 29

= 40 – 34 = 6

∴ The required number = L.C.M – 6

= 1400 – 6 = 1394

15. (B) A = 5th composite number = 10

B = 6th prime number = 13

∴ A – B = 10 – 13 = – 3

16. (D) From options

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

17. (A) Given

$2(l + b) = 80$ m

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

$l + 15$ m $= 40$ m

$l = 40 - 15m = 25m$

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

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

19. (A) Perimeter of triangle

= 10 cm + 15 cm + 17 cm = 42 cm

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) $\frac{4}{15} = 0.266$

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

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

23. (B) ☺ ☺ ☹ = 10 + 10 + 5 = 25

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

∴ $\frac{3}{4}x = 12$ litres

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

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

Cost of 11 kgs wheat

= ₹ 11 × 11 = ₹ 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

∴ 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

Difference = 10,001 – 998 = 9003.

30. (A) 8937 × 648 + 8937 × 122 + 8937 × 230

= 8937 [648 + 122 + 230]

= 8937 × 1000

= 8937000

∴ Answer is option (A).

MATHEMATICS - 2 (MAQ)

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

and 13 × 17 = 221, 7 × 23 = 161

11 × 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

$100x + 10y + z \times 1$

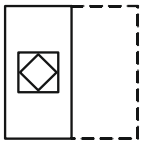
Given $100x + 10y + z - (x + y + z)$
$= 99x + 9y = 9(11x + y)$

$\therefore$ 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

36. (A) 

37. (B) $1^2 = 1 = 1NE$ $4^2 = 16UR$

$2^2 = 4 = 4WO$ $5^2 = 25VE$

$3^2 = 9 = 9EE$ $6^2 = 36IX$

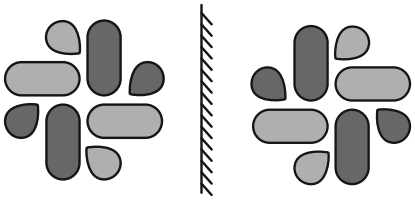
38. (C)

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.

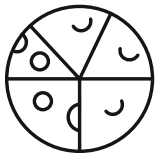
26 – 8 = 18.

39. (D) 

40. (B) First letter represents shaded or (.) in combination of 3 circles 2nd letter represents × 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.



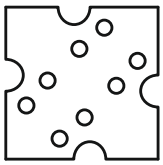
43. (C) Rule is a ★ b = $(a + b)^2$

i.e., 7 ★ 1 = $(7 + 1)^2 = 8^2 = 64$

and 8 ★ 4 = $(8 + 4)^2 = 12^2 = 144$

Similarly 3 ★ 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).

45. (C) 

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

50. (A,B) Option (A) : 

Option (B) :