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UNIFIED COUNCIL OLYMPIADS

UIMO
Unified International Mathematics Olympiad

UNIFIED INTERNATIONAL MATHEMATICS OLYMPIAD (UPDATED)

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,D	A,B,C,D	C,D	D	D	B	C	B
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
B,C	A	D	B	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 × 8 = Rs. 680

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

$\therefore$ Cost of 8 dozen oranges = Rs. 62 × 8 = 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 + Rs. 496 + Rs. 960

= 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 × 2601 + 153 × 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

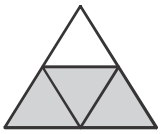
3 + 5 = 8

5 + 8 = 13

8 + 13 = 21

13 + 21 = 34

08. (C)



Option 'C' represents $\frac{3}{4}$

09. (C) 26 × 8 = 208

10. (C) $\text{LHS} = \frac{(1\times2\times3\times.....\times9)(10\times11-10)}{1\times2\times3\times.....9}$

= 110 – 10

= 100

11. (D) odd number × odd number × odd number = odd number

12. (C) Between 45° & 90°

13. (D) Area of bigger rectangle

= 28 cm × (12 + 8) cm = 560 cm^2

Area of smaller rectangle = 8 cm × (28 cm – 9 cm – 5 cm)

= 8 cm × 14 cm = 112 cm^2

Area of shaded region = 560 cm^2 – 112 cm^2 = 448 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 cm^2

25 cm × b = 375 cm^2

b = $\frac{375\ cm^2}{25\ cm}$

= 15 cm

Perimeter = 2(l + b) = 2(25 cm + 15 cm) = 80 cm

19. (D) LCM of 2, 3, 4, 5 = 60

$\frac{1}{2} = \frac{30}{60}, \frac{2}{3} = \frac{40}{60}$

$\frac{3}{4} = \frac{45}{60}, \frac{4}{5} = \frac{4}{5}\times\frac{12}{12} = \frac{48}{60}$

$\frac{4}{5}$ is the greatest fraction.

20. (A) LHS =

$$\frac{1}{3\times5}+\frac{1}{5\times7}+\frac{1}{7\times9}+\frac{1}{9\times11}+\frac{1}{11+13}+\frac{1}{13\times15}$$

$$=\frac{2}{2}\left[\frac{1}{3\times5}+\frac{1}{5\times7}+\frac{1}{7\times9}+\frac{1}{9\times11}+\frac{1}{11\times13}+\frac{1}{13\times15}\right]$$

$$=\frac{1}{2}\left[\frac{2}{3\times5}+\frac{2}{5\times7}+\frac{2}{7\times9}+\frac{2}{9\times11}+\frac{2}{11\times13}+\frac{2}{13\times15}\right]$$

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

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

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

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

21. (D) 2016 is divisible by 3 & 9

(∴ sum of digits = 2 + 0 + 1 + 6 = 9)

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

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

∴ 27 is not a factor of 2016.

22. (A) Required angle is a cute angle

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

= 1225 + 153 + 3672

= 5050

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

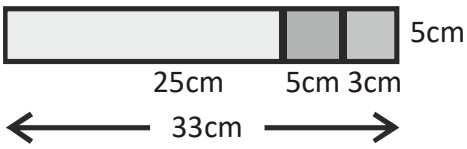
= (6 – 6) = 0

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

25. (D) Perimeter of plot = 2(12 m + 15 m)
= 54 m

Cost of fencing the plot = 54 × Rs. 14 = Rs. 756 = [10(5) + 4] × 14 = ₹756

26. (C)



Total length = 25cm + 5cm + 3cm = 33cm

Breadth = 5 cm

Area of the paper before it was folded

= 33cm × 5cm = 165cm^2

27. (B) 61 + 62 + 63 = 186

∴ Largest number = 63

28. (C) Perimeter of the rectangle = 2(l + b)

$= 2\left(77\frac{3}{4}+72\frac{1}{4}\right)$

= 2 × 150 mts

= 300 mts.

29. (C) (100 – 99) + (98 – 97) + ... +(17 – 13) + (12 – 11)

= 1 + 1 + ... + 1

45 times = 45

30. (D) Through the given initial point we can draw infinite rays

MATHEMATICS - 2

31. (A, B, C, D)

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

∴ 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 [∴ 3 × 5 = 15]

The product of two even numbers is even [∴ 2 × 4 = 8]

The sum of two even numbers is even [∴ 8 × 10 = 18]

33. (A, B, D)

Except option (C) all other 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

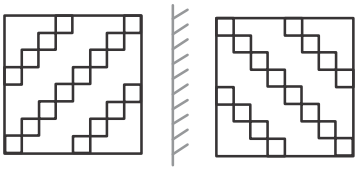
Hence 119 is composite number.

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.

37. (D) 

38. (B) Option A : ATES → EAST

Option B : EWSN → NEWS

Option C : HONRT → NORTH

Option D : EWTS → WEST

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

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

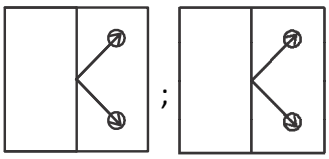
Similarly, $\frac{45+18+27}{10} = 9$

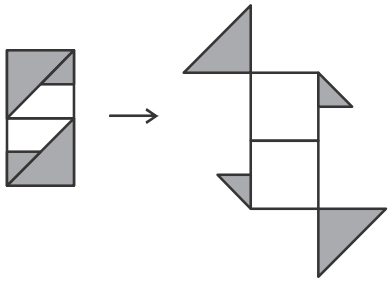
40. (B) o A → A is vowel

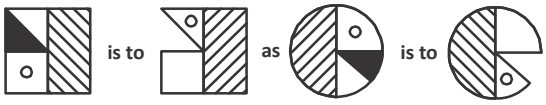
& B → B is consonant

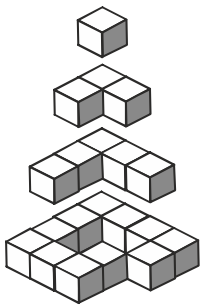
@ C → C is consonant

% D → D is consonant

41. (B,C) 

42. (A) 

43. (D) 

44. (B)  = 20 cubes

45. (B) 3  = 21

 = 7

2  + 7 = 27

2  = 27 – 7 = 20

2  = 20

 = 10

10 –  = 4

 = 10 – 4 = 6

 +  ×  = 6 + 7 × 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