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UNIFIED COUNCIL OLYMPIADS

UIMO
Unified International Mathematics Olympiad

UNIFIED INTERNATIONAL MATHEMATICS OLYMPIAD

CLASS - 6

Question Paper Code : 4O109

KEY

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

SOLUTIONS

MATHEMATICS - 1

01. (C) $(1 + 2 + 3 + ... + 200) - (1 + 2 + 3 + ... + 100) = 20100 - 5050$

$= 15050$

02. (D) Given series is $-17, -15, -12, -8, m, 3$

$-17 + 2 = -15, \ -15 + 3 = -12,$

$-12 + 4 = -8, \ -8 + 5 = -3 = m$

03. (B)
$$\begin{array}{r} 120\overline{)144(1} \\ \underline{120} \\ 24\overline{)120(5} \\ \underline{120} \\ 0 \end{array}$$

$$\begin{array}{r} 24\overline{)216(9} \\ \underline{216} \\ 0 \end{array}$$

$\therefore$ H.C.F of 120 & 144 = 24

04. (D) $(234 \times 567 + 789 \times 234 - 234 \times 125 + 269 \times 234)$

$= 234(567 + 789 - 234 + 269)$

$= 234 \times 1500$

$= 3,51,000$

05. (C) If denominators are same, then smallest numerator fraction becomes smallest

$\therefore$ $\frac{3}{8}$ is the smallest option.

06. (A) $36\frac{1}{3}-\left[12\frac{2}{5}+13\frac{1}{2}+5\frac{1}{6}\right]$

$\Rightarrow \frac{109}{3}-\left[\frac{62}{5}+\frac{27}{2}+\frac{31}{6}\right]$

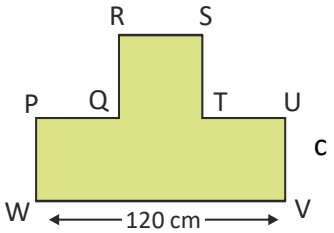
$\Rightarrow \frac{109}{3}-\left[\frac{62\times 6+27\times 15+31\times 5}{30}\right]$

$\Rightarrow \frac{109}{3}-\left[\frac{372+405+155}{30}\right]$

$\Rightarrow \frac{109}{3}-\frac{932}{30} \Rightarrow \frac{1090-932}{30}=\frac{\cancel{158}^{79}}{\cancel{30}15}$

$=5\frac{4}{15}$ cm

07. (C) Perimeter of the figure = PQ + QR + RS + ST + TU + UV + VW + WP = 7(PQ) + VW



(As, PQ = QR = RS = ST = TU = UV = WP)

= 7 × 40 + 120 (As, PQ = $\frac{1}{3}$VW)

= (280 + 120) cm = 400 cm

08. (D) Distance Venu jogged

= 4 [2(135 + 75)] = 4 × 426 = 1704 m

09. (A) Sum of terms of ratio

$=\frac{1}{2}+\frac{1}{3}+\frac{1}{5}=\frac{15+10+6}{30}=\frac{31}{30}$

P's share = $\frac{\frac{1}{2}}{\frac{31}{30}}\times 2170=\frac{1}{2}\times\frac{30}{31}\times 2170$ =

Rs. 1050

Q's share = $\frac{\frac{1}{3}}{\frac{31}{30}}\times 2170=\frac{1}{3}\times\frac{30}{31}\times 2170$ =

Rs. 700

R's share = $\frac{\frac{1}{5}}{\frac{31}{30}}\times 2170=\frac{1}{5}\times\frac{30}{31}\times 2170$ =

Rs. 420

10. (C) $\overline{AC} = \overline{AD} - \overline{CD}$

11. (A) 4.75 – 0.75 = 4

12. (D) Weight of Raj = 69.725 kg

Weight of Suraj = 69.45 kg

Difference = (69.725 – 69.45) kg

= 0.275 kg

$\therefore$ Raj weighs 0.275 kg more than Suraj

13. (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

14. (D) $999\frac{1}{7}+999\frac{2}{7}+999\frac{3}{7}+999\frac{4}{7}+999\frac{5}{7}+999\frac{6}{7}$

$=(999\times 6)+\left(\frac{1}{7}+\frac{2}{7}+\frac{3}{7}+\frac{4}{7}+\frac{5}{7}+\frac{6}{7}\right)$

$=5994+\left(\frac{1+2+3+4+5+6}{7}\right)$

$=5994+\left(\frac{21}{7}\right)$ = 5994 + 3 = 5997

15. (C) XY = (12 – 5.4) cm = 6.6 cm

RS = (10.6 – 3.6) cm = 7 cm

$\therefore$ Total length = (6.6 + 7) cm = 13.6 cm

16. (A) c = 6 $\Rightarrow$ b + c = 8

$\therefore$ b = 2

3a + 2(2) + 6 = 22

3a = 22 – 4 – 6

a = $\frac{12}{3}$ = 4

a + b + c = 4 + 2 + 6 = 12

17. (B) Given one  symbol represents 100 balls

$\Rightarrow$ 600 balls are represented by $\frac{600}{100}$ i.e., 6 symbols

18. (D) 11 + 2 = 13 and 11 × 2 = 22

9 + 4 = 13 and 9 × 4 = 36

8 + 5 = 13 and 8 × 5 = 40

6 + 7 = 13 and 6 × 7 = 42

19. (B) Area of the poster

= 2.5 × 2.5 sq m = 6.25 sq m

Area of the wall

= 10.5 × 8.5 sq m = 89.25 sq m

Area of the wall to be painted

= (89.25 – 6.25) sq m = 83.00 sq m

Cost of painting = 83 × Rs. 12 = Rs. 996

20. (B) Each  represents Rs. 10

Amount saved on Wednesday

= 6 × Rs. 10 = Rs. 60

Amount saved on Monday

= 4 × Rs. 10 = Rs. 40

Difference = Rs. (60 – 40) = Rs. 20

21. (D) 30

22. (C) Number of numbers from 50 to 499

= 499 – 50 + 1 = 450

23. (B) 130 + (–153) + (–163) + (–140) + 120 – (–121) – (121) – (–153) + (–130) – (–163) – (–140) – (120)

= (130 +120 + 121 + 153 +163 + 140) – (153 + 163 +140 + 121 + 130 + 120) = 827 – 827 = 0

24. (C) (A) 6.71 – 4.06 + 11.5 = 14.15

(B) 2.73 – 3.4 + 1.51 = 0.84

(C) 5.62 – 2.36 + 22.3 = 25.56

(D) 16.34-5.23 + 10.6 = 21.71

Decimal number in option (C) is greatest.

25. (C) l × b = 630 sq cm

l × 15 = 630 sq cm

$l = \frac{630}{15}$ = 42 cm

26. (C) $(-3)^2+[-(-3)(2)^2]-(-3)^2(2)^2$

= 9 + 12 – 36 = –15

27. (D) 1056 + (–798) + (–38) + 56

= 1056 – 798 – 38 + 56

= 112 – 836 = 276

28. (B) We have,

7 : 315 : : 5 : x

$\Rightarrow$ 7 × x = 315 × 5

$\Rightarrow x = \frac{315 \times 5}{7}$ = 225

29. (A) Area of shaded region = Outer Area – Inner area = (12×9) – (5×5) = 83 cm^2

30. (D) $6\frac{1}{2}\text{km}+8\frac{3}{4}\text{km}=\frac{13}{2}\text{km}+\frac{35}{4}\text{ km}$

$=\frac{13}{2}\times\frac{2}{2}\text{km}+\frac{35}{4}\text{km}$

$=\frac{26}{4}\text{km}+\frac{35}{4}\text{km}$

$=\frac{26+35}{4}\text{km}$

$=\frac{61}{4}$

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

$4\overline{)\,61\,(15}$

$\underline{60}$

(1)

MATHEMATICS - 2

31. (A, B, C, D)

All options are true.

32. (A, B, D)

A line segment has two end points, so it has a definite length. Except option (C) remains all options are false.

33. (A, B, C)

Option (A) If $x = -2$, then $3x - 10 = 3(-2)+10 = -6 + 10 = 4$

Option (B) If $y = 3$, then $7(3) - 10 = 21 - 10 = 11$

Option (C) If $z = 5$, then $5z - 25 = 5 \times 5 - 25 = 25 - 25 = 0$

If 'D' is $x = \frac{3}{4}$, then $\cancel{12}^{3} \times \frac{3}{\cancel{4}_{1}} - 15 = 9 - 15 = -6 = -3$

34. (A, B, D)

$$\frac{8}{5} = 1.6 \Rightarrow \frac{8}{9}, < 1.6,$$

$$\frac{11}{9} = 1.22 < 1.6,\ 1 < 1.6,\ \frac{10}{3} = 3.33 > 1.6$$

$\frac{8}{9}, \frac{11}{9}$ & 1 are less than $\frac{8}{5}$

35. (B, C)

(A) $1 : 2 :: 3 : 4$

$1 \times 4 = 4$

$2 \times 3 = 6$

$\Rightarrow 4 \neq 6$

(B) $1 : 2 :: 2 : 4$

$1 \times 4 = 4$

$2 \times 2 = 4$

$\Rightarrow 4 = 4$

(C) $1 : 2 :: 3 : 6$

$1 \times 6 = 6$

$2 \times 3 = 6$

$\Rightarrow 6 = 6$

(D) $1 : 2 :: 2 : 3$

$1 \times 3 = 3$

$2 \times 2 = 4$

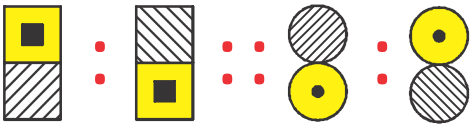
$\Rightarrow 3 \neq 4$

In case of options (B) & (C) only, we observe that product of means = product of extremes.

REASONING

36. (D) $3 \times 6 = 18,\ 5 \times 7 = 35,\ 4 \times 4 = 16$

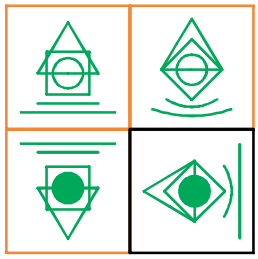
$(1 + 8 = 9)\ (3 + 5 = 8)\ (1 + 6 = 7)$

37. (C) 

38. (C) R is in word CERAMICS

but not in the word MECHANICS

39. (B) 

40. (A) 

41. (A)  The outer shapes is this inside with shaded plane shape.

42. (C) Given expression $= 15 \div 3 + 15 - 5 \times 2$

$= 5 + 15 - 5 \times 2 = 10$

43. (B)

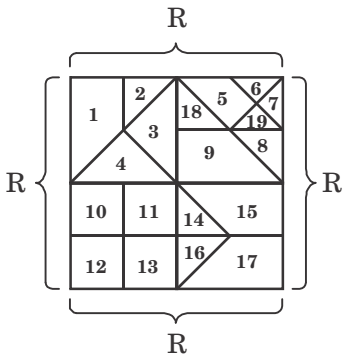
M A T H → N B U L (+1)

S C I E N C E → T D J F O D F (+1)

T E A C H → U F B D I (+1)

Hence UFBDI is the code for TEACH

option (B) is correct answer.

44. (C) 

Number of squares :

10, 11, 12, 13 → 4

1 + 2 + 3 + 4,

6 + 7 + 8 + 9 + 5 + 18 + 19 → 4

10 + 11 + 12 + 13

14 + 15 + 16 + 17

1 big square → 1

Total = 9

Number of triangles :

8, 6, 7, 2, 3, 4, 14, 16, 18, 19 → 10

1 + 2, 3 + 4, 5 + 6, 7 + 19, 6 + 7 → 7

14 + 16, 9 + 18

7 + 8 + 19, 5 + 6 + 7 + 8 + 19, → 3

4 + 3 + 9 + 18

Total = 20

Number of Rectangles:

10 + 12, 11 + 13, 10 + 11, 12 + 13,
14 + 15, 16 + 17, 9 + 8 → 7

11 + 14 + 15, 13 + 16 + 17 → 2

10 + 11 + 14 + 15, 12 + 13 + 16 + 17 → 2

5 + 6 + 7 + 18 + 19,
11 + 14 + 15 + 13 + 16 + 17 → 2

R, R, R, R → 4

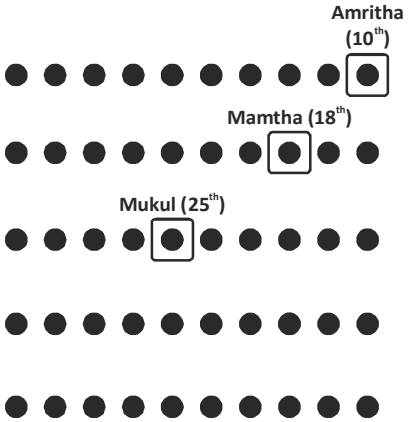
Total = 17

Total : 9 + 20 + 17 = 46

45. (B) 13 – 8 = 5 (from left to left) 5th letter from the left is E.

CRITICAL THINKING

46. (C)



47. (B)

Therefore, A is sitting in between B & C.

48. (C) Let's analyse the information:

(1) Apple + Orange = Pear + Peach

(2) Apple + Pear < Orange + Peach

(3) Pear + Orange < Apple + Peach

From statement 2, we know Apple + Pear is lighter than Orange + Peach

From statement 3, we know Pear + Orange is liter than Apple + Peach

Combining these , we can deduce :

Apple + Pear < Orange + Peach < Apple + Peach

Since Apple + Pear is lighter than Orange + Peach, We can conclude:

Peach > Orange > Apple > Pear

∴ The heaviest fruit is the Peach

49. (C) As the number in front of ? in the 1st line is 6

The no. above 6 is 27 so the difference is 27 – 6 = 21

Thus the number above 27 would be 27 + 21 = 48 and the no. above 48 would be 48 + 21 69. The no. at the question mark is 69.

50. (A) Because the balls are the same size, only the steepness of the incline influences how fast they will roll, the steeper the incline, the more easily an object will move downward. Hence, ball A is able to roll faster than ball B.