UIM
Unified International Mathematics Olympiad

UNIFIED INTERNATIONAL MATHEMATICS OLYMPIAD

CLASS - 6
Question Paper Code : UM9267

KEY

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

EXPLANATIONS

MATHEMATICS - 1

01. (D) Let the number of marbles that Gouthami has be 100

Number of marbles left with Gouthami after 20%

marbles given to Pardhu = 100 – 20 % of 100 = 80

Number of marbles left with Gouthami after given to Esha = 80 – 10% of 80 = 72

Remaining marbles with Gouthami

= 72 – 25% of 72

$= 72 - \dfrac{25}{100} \times 72 = 54$

02. (B) LHS

$= \dfrac{0.001 + 0.008 + 0.027 - 0.018}{0.01 + 0.04 + 0.09 - 0.02 - 0.06 - 0.03}$

$= \dfrac{0.018}{0.03}$

$= \dfrac{1.8}{3} = 0.6$

03. (B) Required sum =

$(8 + 6) + (16 + 6) + (24 + 6) + ... + (88 + 6)$

$= (8 + 16 + 24 + ... + 88) + (6 + 6 + 6 + ... + 6)$

eleven 6's

$= 8(1 + 2 + 3 + ... + 11) + 66$

$= 8 \times 66 + 66$

$= 594$

04. (A) Total amount to be paid for 12 kms

$= ₹ 16.8 + 4 \times ₹ 9.60 + 7 \times ₹ 6.30$

$= ₹ 16.8 + ₹ 38.4 + ₹ 44.1$

$= ₹ 99.3$

05. (A) E = 7 & A = 6 & B + C + D = 20

$\therefore$ A + B + C + D + E

$= 7 + 20 + 6 = 33$

06. (B) Given $\dfrac{y}{z} \times \dfrac{z}{x} = \dfrac{3}{2} \times \dfrac{1}{6} = \dfrac{1}{4}$

$\dfrac{y}{x} = \dfrac{1}{4}$

$\Rightarrow \dfrac{x}{y} = 4$

$\therefore \dfrac{w}{x} \times \dfrac{x}{y} = \dfrac{4}{3} \times 4 = \dfrac{16}{3}$

$\therefore$ w : y = 16 : 3

07. (C) LHS

$= 9999 + \dfrac{1}{11} + 9999 + \dfrac{2}{11} + 9999$

$+ \dfrac{3}{11} + ... + 9999 + \dfrac{10}{11}$

$= (9999 + 10) +$

$\left(\dfrac{1}{11} + \dfrac{2}{11} + \dfrac{3}{11} + \dfrac{4}{11} + \dfrac{5}{11} + \dfrac{6}{11} + \dfrac{7}{11} + \dfrac{8}{11} + \dfrac{9}{11} + \dfrac{10}{11} \right)$

$= 99990 + \left(\dfrac{1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10}{11} \right)$
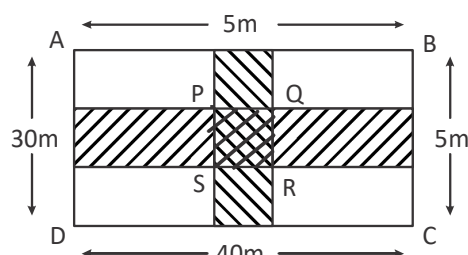
$= 99990 + \dfrac{55}{11} = 99995$

08. (B) Area of the shaded region

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

09. (B) Among the given options $\dfrac{45}{2}$ is least common multiplier of the given four fractions.

10. (A) Area of both paths = Area of the path parallel to length + Area of the path parallel to breadth − Area of square PQRS

$= 40 \times 5 \text{ m}^2 + 30 \times 5 \text{ m}^2 - 5 \times 5 \text{ m}^2$

$= 200 \text{ m}^2 + 150 \text{ m}^2 - 25 \text{ m}^2 = 325 \text{ m}^2$

11. (C)

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0.75) 1.05 (1
      0.75
      0.3) 0.75 (2
           0.60
           0.15) 0.3 (2
                 0.3
                  0
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$\therefore$ HCF of 0.75 and 1.05 = 0.15

12. (C) Let the number be 'x'

$4x + 11 = -81$

$4x = -81 - 11 = -92$

$x = \dfrac{-92}{4} = -23$

13. (A) Given 200 min : 240 min = 20 km : x km

$\therefore$ Product of extreems = Product of means

$\therefore$ $5x = 6 \times 20$

$x = \dfrac{6 \times 20}{5} = 24$

14. (C) −1 is the greatest negative integer.

15. (A) 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31

∴ 31 is the 16th odd number

∴ 1 + 3 + 5 + 7 + 9 + ...+ 31

= 16 × 16 = 256

16. (C) CXL + LXXXIV − XC − LIX

= 140 + 84 − 90 − 59 = 75 = LXXV

17. (B) Number of matchsticks used in pattern

1 = 3 = 2 + 1

Number of matchsticks used in pattern

2 = 5 = 2 × 2 + 1

Number of matchsticks used in pattern

3 = 7 = 2 × 3 + 1

∴ Number of matchsticks used in pattern

99 = 2 × 99 + 1 = 198 + 1 = 199

18. (D) A circle has more than 10 lines of symmetry.

19. (B) Option 'B' satisfies the given all conditions.

20. (B) Dividend = Divisor × Q + R

3134688 = divisor × 9765 + 123

∴ Divisor × 9765 = 3134688 − 123

= 3134565

∴ Divisor = $\dfrac{3134565}{9765}$ = 321

21. (A) $\dfrac{a}{b} \times \dfrac{b}{c} \times \dfrac{c}{d} = \dfrac{1}{3} \times 2 \times \dfrac{1}{2} \Rightarrow \dfrac{a}{d} = \dfrac{1}{3}$

$\dfrac{b}{c} \times \dfrac{c}{d} \times \dfrac{d}{e} = 2 \times \dfrac{1}{2} \times 3 \Rightarrow \dfrac{b}{e} = 3$

$\dfrac{c}{d} \times \dfrac{d}{e} \times \dfrac{e}{f} = \dfrac{1}{2} \times 3 \times \dfrac{1}{4} \Rightarrow \dfrac{c}{f} = \dfrac{3}{8}$

∴ $\dfrac{abc}{def} = \dfrac{a}{d} \times \dfrac{b}{e} \times \dfrac{c}{f} = \dfrac{1}{3} \times 3 \times \dfrac{3}{8} = \dfrac{3}{8}$

22. (D) $\dfrac{-19}{18} = -1.055$, $\dfrac{-18}{17} = -1.058$

$\dfrac{-17}{16} = -1.0625$, $\dfrac{-16}{15} = -1.066$

∴ $\dfrac{-16}{15} < \dfrac{-17}{16} < \dfrac{-18}{17} < \dfrac{-19}{18}$

23. (B) Given r = 14 cm

∴ Diameter = 2r = 2 × 14 cm = 28 cm

24. (D) Sum of four angles of a square

= 4 × 90° = 360°

25. (C) 1000002 is the smallest 7 digit number having 3 different digits.

26. (B) Total no. of letters collected in the whole week = 33

Given each ✉ = 10 letters

∴ Total no. of letters = 33 × 10

= 330 letters

27. (B) LHS = $\dfrac{41}{10} - \left[\dfrac{5}{6} - \left\{ \dfrac{1}{6} - \left(\dfrac{12+9-8}{30} \right) \right\} \right]$

= $\dfrac{41}{10} - \left[\dfrac{5}{6} - \left\{ \dfrac{1}{6} - \dfrac{13}{30} \right\} \right]$

= $\dfrac{41}{10} - \left[\dfrac{5}{6} - \left\{ \dfrac{5-13}{30} \right\} \right]$

= $\dfrac{41}{10} - \left[\dfrac{5}{6} + \dfrac{8}{30} \right]$

= $\dfrac{41}{10} - \left[\dfrac{25+8}{30} \right]$

= $\dfrac{41}{10} - \dfrac{33}{30} = \dfrac{123-33}{30}$

= $\dfrac{90}{30}$ = 3

28. (A) LHS = −145 + 79 − 265 − 41 + 2 + 1056 − 798 − 38 + 44 − 1

= −145 − 265 − 41 − 798 − 38 + 79 + 2 + 1056 + 44 − 1

= − 106 − 1 = −107

29. (C) A square pyramid has 4 lateral faces and one base.

∴ Total faces = 4 + 1 = 5

30. (D) Cost of each table = $\dfrac{₹23152}{32}$ = ₹ 723.5

∴ Number of tables can be purchased for

= ₹ 39,069

= $\dfrac{₹\,39,069}{₹\,723.5}$ = 54

MATHEMATICS - 2	**REASONING**

MATHEMATICS - 2

31. (B, C)

If r = 2 then

∴ p + q + r = 43 + 47 + 2 = 92

If r = 5, then p = 2 & q = 1009

∴ p + q + r = 1009 + 2 + 5 = 1016

32. (A, B, C)

HCF must be factor of LCM

∴ 12, 8 & 24 are factors of 240

12, 8 & 24 may be HCF of the given numbers

33. (A, B, C)

If the given number is divisible by

5 & 6 ⇒ b = 0

If 5431a60 is divisible by 3

∴ a can be 2, 5 (or) 8

∴ a + b = 2 + 0, 5 + 0, 8 + 0 ie 2,5 & 8

34. (A, B, C)

Only CLIX = 100 + 50 + 9 = 159 is the correct option rest of the remaining options are meaningless.

35. (A,B,C,D)

Divisor × Quotient

= 210 − 6 = 204 = 17 × 12

∴ 210 is divided by 12 then the remainder is 6

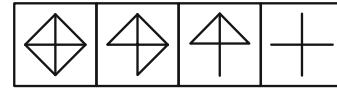210 is divided by (17 × 4) then the remainder is 6

210 is divided by (17 × 2) then the remainder is 6

210 is divided by (17 × 3) then the remainder is 6

REASONING

36. (D) Every time first and last letters are removed.

'tegorical' is the missing word.

37. (A)

38. (C)

39. (B) U _ _ R _Q (from R is third to right of U and Q is second to right of R).

S is to immediate right of P. Only place left for this is between U and R.

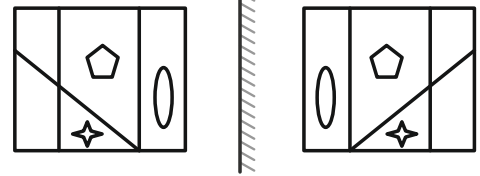Therefore seating arrangement is U P S R T Q

40. (D) ISLAND = I and A are vowels replace with alphabet number.
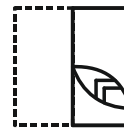
41. (B) (9 − 6 = 3,3 × 7 = 21)

(10 − 5 = 5, 5 × 5 = 25)

(8 − 4 = 4, 4 × 4 = 16)

42. (D)

43. (D) 8 + 10 = 18th letter from left i.e., R

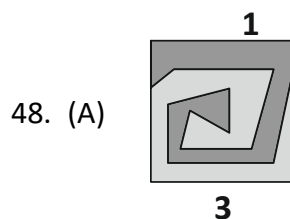**44.** (D)

45. (A) 6 students have star and cross symbols.

CRITICAL THINKING

46. (C)
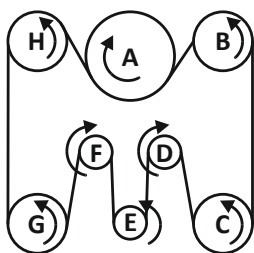
47. (B) Contact your nearest police station and deposit it there.

48. (A)

49. (A) There are four friends Amit, Bitu, Chintu and Dilip. Each of them have a favourite colour which is one of White, Gold, Yellow, Black. No two person have same favourite colour. Given below is some information about their favourite colour.

- Bitu's favourite colour begins with the same letter as his name = black

- Chintu likes a sparkling colour = gold

- Dilip likes a colour which is not part of the rainbow = white

- Amit likes a light colour = yellow

50. (C) 14, 17, 20, 23

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