



# UNIFIED COUNCIL

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## UNIFIED CYBER OLYMPIAD (UPDATED)

CLASS - 8

Question Paper Code : UC345

### KEY

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

### SOLUTIONS

#### MENTAL ABILITY

1. (A) Area of quadrilateral

$$PQRS = \frac{1}{2} \times PR \times SN + \frac{1}{2} \times PR \times QM$$

$$= \frac{1}{2} \times 22 \times 3 \text{ cm}^2 + \frac{1}{2} \times 22 \times \text{cm}^2$$

$$= 33 \text{ cm}^2 + 33 \text{ cm}^2 = 66 \text{ cm}^2$$

2. (B)  $(a+b) - (a-b) = 2$

$$a + b - a + b = 2$$

$$2b = 2$$

$$b = 1$$

'a' is any natural number other than 1

$\therefore$  a and b must be co-primes.

3. (C) Given  $\frac{\sqrt{3}}{2}a = 9 \text{ cm}$

$$a = \frac{18}{\sqrt{3}} \text{ cm}$$

$$A = \frac{\sqrt{3}}{4}a^2 = \frac{\sqrt{3}}{4} \times \frac{18}{\sqrt{3}} \times \frac{18}{\sqrt{3}} \text{ cm}^2$$

$$= \frac{81}{\sqrt{3}} \text{ cm}^2$$

$$A = 27\sqrt{3} \text{ cm}^2$$

4. (A) Given  $x = \sqrt[3]{\sqrt{2+1}}$

Cubing on both sides

$$x^3 = \sqrt{2+1}$$

$$\Rightarrow \left(x - \frac{1}{x}\right)^3 + 3\left(x - \frac{1}{x}\right) = x^3 - \frac{1}{x^3} - 3\left(x - \frac{1}{x}\right) + 3\left(x - \frac{1}{x}\right)$$

$$= x^3 - \frac{1}{x^3}$$

$$= (\sqrt{2+1}) - \frac{1}{\sqrt{2+1}}$$

$$= \sqrt{2+1} - (\sqrt{2}-1)$$

$$= \sqrt{2+1} - \sqrt{2} + 1$$

$$= 2$$

5. (B) Let speed of fastest train be  $x$  kmph

$\Rightarrow$  Speed of slow train =  $(x - 5)$  kmph

Distance travelled by both trains in 3 hours =  $3[x + x - 5]$  Km

$(6x - 15)$  Km

Given  $(6x - 15)$  km +  $20$ km =  $425$  km

$$6x + 5 \text{ km} = 425 \text{ km}$$

$$6x = 420 \text{ km}$$

$$x = 70 \text{ km}$$

6. (C)  $\sqrt{4a^2 - 4a + 1} + 3a = \sqrt{(1-2a)^2} + 3a$

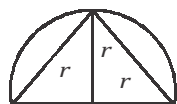
$$= 1 - 2a + 3a$$

$$= 1 + a$$

$$= 1 + 0.1039$$

$$= 1.1039$$

7. (A) Base =  $2r$  units and  $h = r$  units



$$\text{Area} = \frac{1}{2} \times 2r \times r = r^2$$

8. (A)  $\left(\frac{\frac{1}{x} + \frac{1}{y}}{\frac{1}{x}}\right)^{-1} + \left(\frac{\frac{1}{x} - \frac{1}{y}}{\frac{1}{x}}\right)^{-1}$

$$= \left(\frac{x+y}{xy}\right)^{-1} + \left(\frac{y-x}{xy}\right)^{-1}$$

$$= \left(\frac{1}{\frac{1}{x}}\right) + \left(\frac{1}{\frac{1}{x}}\right)$$

$$= \left(\frac{x+y}{y}\right)^{-1} + \left(\frac{y-x}{y}\right)^{-1}$$

$$= \frac{y}{x+y} + \frac{y}{y-x}$$

$$= \frac{y^2 - xy + xy + y^2}{y^2 - x^2} = \frac{2y^2}{y^2 - x^2}$$

9. (D)  $\frac{1}{\sqrt{2}-\sqrt{3}}$  is an irrational & real

10. (C)  $4^{2018}$  units place is 6

[ $\because$  4 power is even]

11. (C) Total discount =  $(x - 12\% x) \times 80\%$

$$= \left(x - \frac{12}{100}x\right) \times \frac{4}{5}$$

$$= \frac{88x}{100} \times \frac{4}{5} = \frac{88x}{125}$$

Single discount =

$$x - \frac{88x}{125} = \frac{125x - 88x}{125} = \frac{37x}{125}$$

Single discount percentage

$$= \left(\frac{37x}{125}\right) \times 100 = \frac{148}{5}\% = 29\frac{3}{5}\%$$

12. (C)  $x + \frac{1}{x} = 5$

$$\text{But } \left(x - \frac{1}{x}\right)^2 = \left(x + \frac{1}{x}\right)^2 - 4x \times \frac{1}{x}$$

$$= 5^2 - 4$$

$$x - \frac{1}{x} = \sqrt{21}$$

13. (C) Volume of required water  
 $= 8m \times 7m \times (3.5-1.8) m$   
 $= 95.2 m^3$
14. (D)  $(2a+b-3c)(2a-5b+3c) = 4a^2 - 10ab + 6ca + 2ab - 5b^2 + 3bc - 6ca + 15bc - 9c^2$   
 $= 4a^2 - 8ab - 5b^2 + 18bc - 9c^2$   
 $= 4a^2 - 8ab + 4b^2 - 4b^2 - 5b^2 + 18bc - 9c^2$   
 $= 4(a^2 - 2ab + b^2) - 9(b^2 - 2bc + c^2)$   
 $= 4(a-b)^2 - 9(b-c)^2$

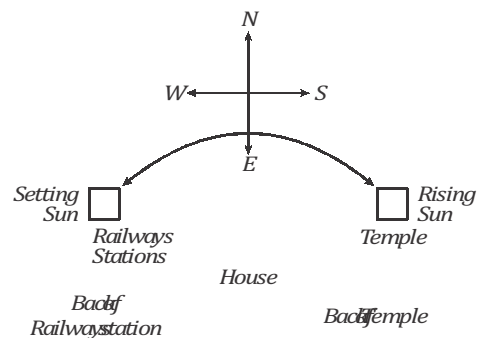
15. (A)  $LHS = \frac{-1}{8} + \frac{8-1+9}{9-4} + \frac{343}{1331} \times \frac{121}{98}$   
 $= \frac{-1}{8} + \frac{16}{5} + \frac{7}{22} = \frac{-55 + 1408 + 140}{440}$   
 $= \frac{1493}{440} = 3 \frac{173}{440}$

### REASONING

16. (C) The pattern follows as given below :  
 $74 = 72 + 42 = 49 + 16 = 65$ . Similarly,  
 $36 = 32 + 62 = 9 + 36 = 45$ .
17. (A) Calculate the difference of numbers in each column. It follows a particular sequence like 6,5,4,3,2,1.  
 $8 - 2 = 6$ ;  $9 - 4 = 5$ ;  $7 - 3 = 4$ ;  $9 - 6 = 3$ ;  $8 - 6 = 2$ ;  $4 - 3 = 1$ . So, answer is 4.
18. (D) In this series, the letters remain the same: DEF. The subscript numbers follow this series: 1,1,1; 1,1,2; 1,2,2; 2,2,2; 2,2,3.
19. (C)  $20 = 4^2 + 4$ ,  $42 = 6^2 + 6$ ,  $58 = 7^2 + 9$ ,  $72 = 8^2 + 8$  and  $90 = 9^2 + 9$ . 20, 42, 72 and 90 can be expressed in  $n^2 + n$  form but not 58.
20. (A) Dafta means advise; foni is the same as the suffix -ment; imo is the same as the prefix mis-; lokti means conduct. Since the only word in the answer choices that hasn't been defined is krata, it is reasonable to assume that krata means state.

Therefore, kratafoni is the only choice that could mean statement.

21. (B)
22. (D) ЭVITATITИAУQ
23. (B) 1,4,8; 2,5,9; 3,6,7
24. (A) RORING is divided into 2 halves i.e RING and RO. They are interchanging everytime. The middle letters follow 2 table.
25. (D) except "U" remaining are consonants.
26. (A) The possible seating arrangements are BCAD, CBAD, DBAC, CADB, DBCA. A cannot occupy the first place.
27. (C) Second is the result of the first.
28. (A) Thus temple is in the east with respect to the railway station.



29. (D)
30. (C)  $19.45 = 7.45$  means hour (smaller) hand is between 7(P) and 8(R) and minute (bigger) hand is on 9(T).

### COMPUTERS

31. (D)      32. (D)      33. (D)
34. (C)      35. (D)      36. (C)
37. (D)      38. (D)      39. (B)
40. (D)      41. (A)      42. (B)
43. (C)      44. (C)      45. (D)

### ENGLISH

46. (C)      47. (D)
48. (A) Eon, one, not, ten, ton, net, toe.
49. (B)      50. (A)