8

CUBES

Directions for Q1 - Q10:
A cube of each side 4 cm has been painted black, red and green on pairs of opposite faces. It is then cut into small cubes of each side 1 cm. Then find

1. How many small cubes will be there?
2. How many small cube will have three faces painted?
3. How many small cubes will have no faces painted?
4. How many small cubes will have only one faces painted?
5. How many small cubes will have only two faces painted?
6. How many small cubes will have only two faces painted black and green and all other faces unpainted?
7. How many small cubes will have only two faces painted green and red?
8. How many small cubes will be only black painted?
9. How many small cubes will have at least two faces painted?
10. How many small cubes will have at least one face painted?

    Directions for Q11 & Q12:
    A cube is painted in such a way that a pair of adjacent faces is painted in green; a pair of opposite faces is painted in yellow and another pair of adjacent faces is painted in red. This cube is now cut into 125 small but identical cubes.

11. How many of the small cubes do not have green colour but have yellow or red colours on them?
    A. 40
    B. 75
    C. 80
    D. 53
12. How many small cubes have exactly two painted face and have exactly two colours on them?
    A. 36
    B. 30
    C. 24
    D. 34

    Directions for Q13 - Q15:
    A wooden cuboid of dimensions 9 x 7 x 5 unit is painted in a fixed pattern.

    - The two opposite faces in the front and back are painted in red with 9×7 cuts.
    - The other two opposite faces on the sides are painted in green with 7×5 cuts.
    - The remaining faces are painted in blue.

    The cuboid is cut into 315 small cubes.

13. How many cubes have one face coloured?
    A. 142
    B. 105
    C. 71
    D. None of these

14. How many cubes have two faces coloured?
    A. 60
    B. 142
    C. 105
    D. None of these

15. How many cubes have two faces coloured, that too Red and Green?
    A. 14
    B. 20
    C. 32
    D. None of these

    Directions for Q16 & Q17:
    A cube of side 10 cm is coloured red with a 2 cm wide green strip along all the sides on all the faces. The cube is cut into 125 smaller cubes of equal size.

16. How many cubes have at least two green faces each?
    A. 40
    B. 44
    C. 64
    D. 56

17. How many cubes have one face red and an adjacent face green?
    A. 0
    B. 4
    C. 6
    D. 2

    Directions for Q18 & Q19:
    The following questions are based on the information given below:

    - A cuboid shaped wooden block has 6 cm length, 4 cm breadth and 1 cm height.
    - Two faces measuring 4 cm x 1 cm are coloured in black.
    - Two faces measuring 6 cm x 1 cm are coloured in red.
    - Two faces measuring 6 cm x 4 cm are coloured in green.

    The block is divided into 6 equal cubes of side 1 cm (from 6 cm side), 4 equal cubes of side 1 cm (from 4 cm side).

18. How many small cubes will be formed?
    A. 8
    B. 16
    C. 24
    D. 32

19. How many cubes having red, green and black colours on at least one side of the cube will be formed?
    A. 2
    B. 4
    C. 6
    D. 8

    Directions for Q20 & Q21:
    216 cubes of similar size are arranged in the form of the bigger cube (6 cubes on each side, i.e.., $6 \times 6 \times 6$).It's all the 6 faces are painted with Green, Red, blue, black, white, orange colours.

20. How many cubes are painted with red or blue but not green?
    A. 55 or 65
    B. 72 or 66
    C. 55 or 60
    D. None of these

21. Which of the following statement is correct?
    (i) At least 1 cube is painted with red, green and blue.
    (ii) At most 1 cube is painted with red, green and blue.
    (iii) At most 6 cubes are painted with red and green.
    (iv) At least 6 cubes are painted with red and green.
    A. Only (i) & (iii)
    B. Only (ii) & (iii)
    C. Only (ii) & (iv)
    D. None of these

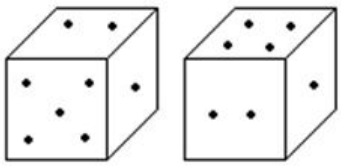
    Directions for Q22 - Q24:
    A cube of 7 cm $\times$ 7 cm $\times$ 7 cm is kept in the corner of a room and painted in three different colours, each face in one colour. The cube is cut into 343 smaller but identical cubes.

22. How many smaller cubes do not have any face painted?
    A. 125
    B. 180
    C. 144
    D. 216

23. How many smaller cubes have exactly one colour on them?
    A. 108
    B. 72
    C. 36
    D. 24

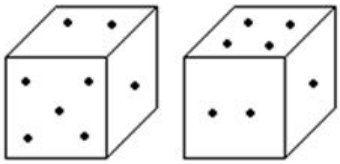
24. How many smaller cubes have at the most two faces painted?
    A. 343
    B. 342
    C. 256
    D. 282

25. Two positions of dice are shown below. How many points will appear on the opposite to the face containing 5 points?



    A. 4
    B. 6
    C. 1
    D. 3

26. Which digit will appear on the face opposite to the face with number 1?



    A. 3
    B. 6
    C. 5
    D. Cannot be determined

    Directions for Q27 - Q29:
    The faces of a cuboid are painted with three different colors - red, yellow, and green such that each color is painted on at least one face. Now 3, 4 and 5 cuts are made in three different directions.

27. What is the maximum possible number of smaller pieces that have only red color on them?
    A.64
    B.56
    C.48
    D.40

28. What is the maximum possible number of smaller pieces that do have neither Yellow nor Red color on any face?
    A.44
    B.40
    C.76
    D.80

29. What is the least and the highest possible number of smaller pieces with 3 colors painted on them respectively?
    A. 2 and 4
    B. 4 and 4
    C. 8 and 0
    D. 0 and 8

30. Two equi-dimensional cubes are joined face-to-face and are coloured red on all of their available, open faces. One cube is then cut into 8 equal smaller cubes and the other cube is cut into 27 equal smaller cubes. How many smaller cubes have only one of their faces coloured?
    A. 3
    B. 9
    C. 6
    D. 8

    Directions for Q31 - Q35:
    A cube is cut into two equal parts along a plane parallel to one of its faces. One piece is then coloured red on the two larger faces and green on the remaining while the other is coloured green on two smaller adjacent faces and red on the remaining. Each is then cut into 32 cubes of the same size. The 64 cubes are then mixed up.

31. How many cubes have no coloured face at all?

A. 16
B. 8
C. 4
D. 0

32. How many cubes have only one coloured face?
A. 8
B. 16
C. 20
D. 24

33. How many cubes have two red and one green face?
A. 4
B. 8
C. 12
D. 16

34. How many cubes have one face red another green?
A. 32
B. 24
C. 16
D. 8

35. What is the number of cubes with at least one green face?
A. 46
B. 38
C. 36
D. 28

36. All the six faces of a cube of a cube are coloured with six different colours - black, brown, green, red, white and blue.
- Red face is opposite to the black face.
- Green face is between red and black faces.
- Blue face is adjacent to white face.
- Brown face is adjacent to blue face.
- Red face is in the bottom.

The face opposite to brown is ____.

37. 27 wooden unit cubes are put together to form a 3*3*3 cube this cube is now painted on all sides with red and then taken apart again. Karishma takes all those cubes which has only one side paint, swetha takes all those cubes which have two sides painted. How many more cubes does swetha have than karishma?

38. An ant starts walking on the edges of a cube starting from any one vertex. What is the maximum edge that it can cover without reusing any edge?
The vertices can be reused.

39. A cube to be coloured in such a way as to avoid the same color on adjacent surfaces. What is the minimum number of colors you will require?

40. Cube is made into a number of small cubes by dividing each edge into four equal parts. What is the minimum number of additional small cubes required to create a bigger cube that will completely enclose the original cube?

ANSWER KEY

1. 64	2. 8	3. 8	4. 24	5. 24	6. 8	7. 8	8. 8	9. 32	10. 56
11. D	12. B	13. A	14. A	15. B	16. B	17. A	18. C	19. B	20. C
21. B	22. D	23. A	24. B	25. A	26. D	27. B	28. D	29. A	30. B
31. D	32. B	33. A	34. B	35. B	36. White	37. 6	38. 9	39. 3	40. 152