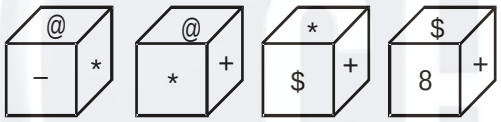
Chapter - 8

DICE AND CUBE

Answer Key with **Step-by-Step Solutions**
Includes: All MCQs + **Extra PYQs** with Detailed Explanations

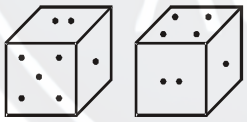
Previous Year Questions

1. Which symbol will be on the face opposite to the face with symbol * ?



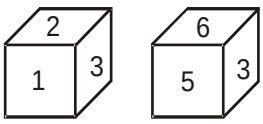
(a) @ (b) $
(c) 8 (d) +

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



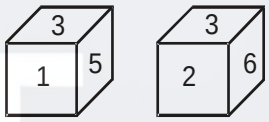
(a) 3 (b) 1
(c) 2 (d) 4

3. Which digit will appear on the face opposite to the face with number 4?



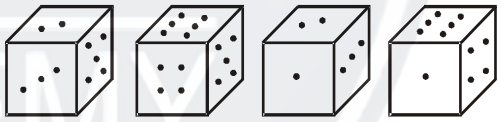
(a) 3 (b) 5
(c) 6 (d) 2 / 3

4. Two positions of a dice are shown below. Which number will appear on the face opposite to the face of the number 5?



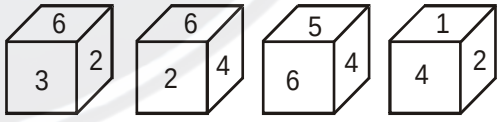
(a) 2 / 6 (b) 2
(c) 6 (d) 4

5. How many points will be on the face opposite to in face which contains 2 points?



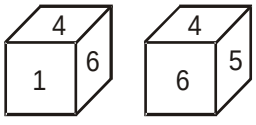
(a) 1 (b) 5
(c) 4 (d) 6

6. Which number is on the face opposite to 6?



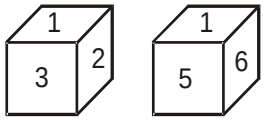
(a) 4 (b) 1
(c) 2 (d) 3

7. Two positions of a dice are shown below. When number '1' is on the top. What number will be at the bottom?



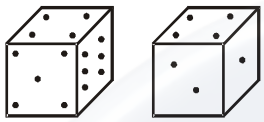
(a) 3 (b) 5
(c) 2 (d) 6

8. Two positions of a cube with its surfaces numbered are shown below. When the surface 4 touch the bottom, what surface will be on the top?



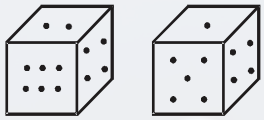
(a) 1 (b) 2
(c) 5 (d) 6

9. Here two positions of dice are shown. If there are two dots in the bottom, then how many dots will be on the top?



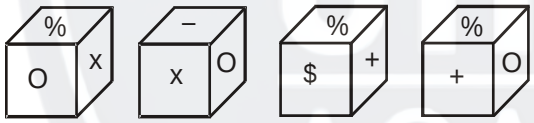
(a) 2 (b) 3
(c) 5 (d) 6

10. Two positions of dice are shown below. How many points will be on the top when 2 points are at the bottom?



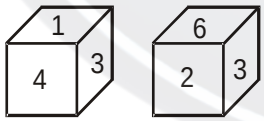
(a) 6 (b) 5
(c) 4 (d) 1

11. Here 4 positions of a cube are shown. Which sign will be opposite to '+'?



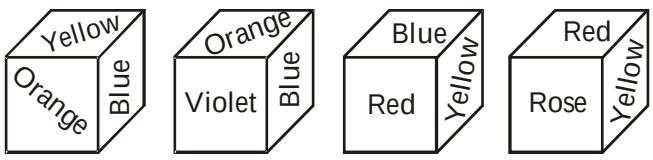
(a) % (b) –
(c) x (d) $

12. Two positions of a cubical block are shown. When 5 is at the top which number will be at bottom?



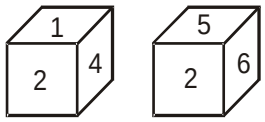
(a) 1 (b) 2
(c) 3 (d) 4

13. From the four positions of a dice given below, find the color which is opposite to yellow?



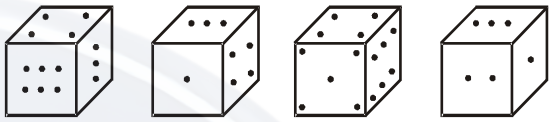
(a) Violet (b) Red
(c) Rose (d) Blue

14. When the digit 5 is on the bottom then which number will be on its upper surface?



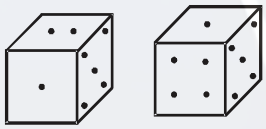
(a) 1 (b) 3
(c) 4 (d) 6

15. How many points will be on the face opposite to the face which contain 3 points?



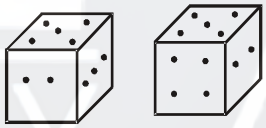
(a) 2 (b) 4
(c) 5 (d) 6

16. observe the dots on the dice (one to six dots) in the following figures. How many dots are contained on the face opposite to the containing four dots?



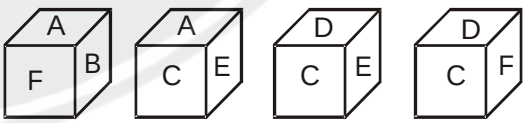
(a) 2 (b) 3
(c) 5 (d) 6

17. Two positions of a dice are shown below. When 3 points are at the bottom, how many points will be at the top?



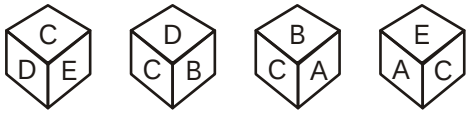
(a) 2 (b) 5
(c) 4 (d) 6

18. From the positions of a cube are shown below, which letter will be on the face opposite to face with 'A'?



(a) D (b) B
(c) C (d) F

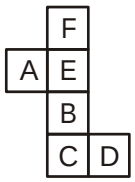
19. Four position of dice are given below. Which letter will be opposite to D.



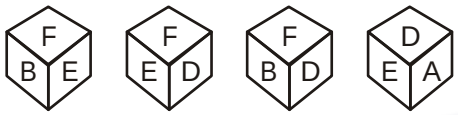
(a) B (b) C
(d) D (d) A

20. Which of the following cubes can be created by folding the given figure.

Question figure :



Answer figure :



(a) (b) (c) (d)

21. Two positions of dice are given. Which number would be at the top when bottom is 2.

(a) 4 (b) 1
(c) 5 (d) 6

22. Two positions of a dice are given. How many triangles would be at the top when bottom is one triangle present.

(a) 4 (b) 3
(c) 2 (d) 5

23. Four positions of a dice are given which spot opposite to face of dice having 6 spots.

(a) (b) (c) (d)

(a) 1 (b) 3
(c) 5 (d) 2

24. Given various views of a dice, what number will be at the top if its bottom digit 4 is available.

(a) (b) (c)

(a) 1 (b) 6
(c) 5 (d) 2

Direction (25-30): If any cube which opposite side are coloured with Red, Green and Blue, and its side is 15 cm. If it is cut into smaller cubes of side 5 cm, then

25. Find out number of cubes that are coloured with only green colour.
(a) 1 (b) 2
(c) 3 (d) 4

26. Find out number of cubes which coloured with at least two colours.
(a) 15 (b) 18
(c) 20 (d) 29

27. The numbers of cubes which doesn't have any colour
(a) 1 (b) 15
(c) 14 (d) 18

28. The number of cubes that have red colour.
(a) 1 (b) 15
(c) 14 (d) 18

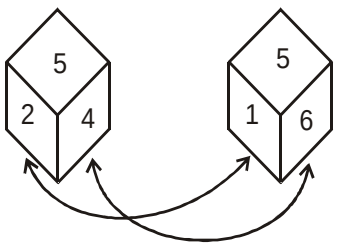
29. The number of cubes that have blue but not with red.
(a) 6 (b) 8
(c) 10 (d) 12

30. The number of cube that have only one face coloured.
(a) 16 (b) 10
(c) 6 (d) 8

Practice Set Solutions

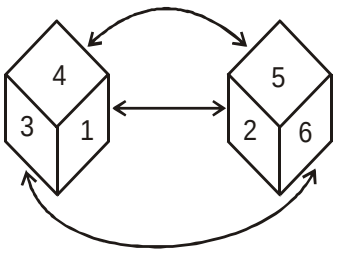
1. (b); From both figures it is clear that numbers adjacent to 2 are 3, 1 and 4. Hence number 5 or 6 will be opposite to number 2.
2. (d); Clearly that position is rotated from left to right twice. Hence number 5 will be opposite to number 1.

(3 to 5)

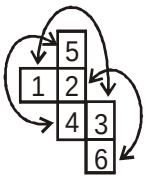


3. (a); Clearly number 1 will be opposite to number 2.
4. (b); Clearly number 6 will be opposite to number 4.
5. (c); From both figure, it is clear that numbers adjacent to 5 are 2, 4, 1 and 6. Hence number 3 will be opposite to number 5.

(6 to 8)

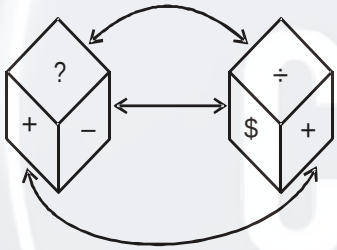


6. (a); Clearly number 5 will be opposite of number 4.
7. (c); Clearly number 6 will be opposite of number 3.
8. (a); Clearly number 2 will be opposite of number 1.
9. (a); In such kind of figure the opposite sides of dice will be in such a way showing below.



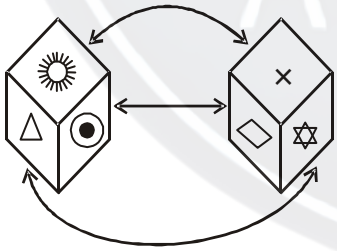
Clearly number 3 will be opposite to number 1.

10. (a); From the figure (1), (2) and (3) it is clear that numbers adjacent to 6 are 2, 3, 4, 5. Hence number 1 will be opposite to number 6.
11. (a); From the figure (1) and (2) It is clear that numbers adjacent to 3 are 2, 6, 1 and 3. Hence number 5 will be opposite to number 3.
12. (b); If we rotate position (3) from left to right, then we come to know that number 2 will be opposite to number 4.
13. (b); If we rotate position (1), (2) and (3) from left to right repectively then we come to know letter E will be opposite to letter B.
14. (a);



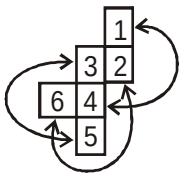
Symbol ? will be opposite to symbol ÷

15. (b); If we rotate position (1), (2) and (3) from up to down respectively then we come to know, rosy will be opposite to black.
16. (a);



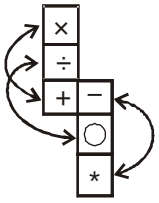
× is opposite to the symbol ☼

17. (a); If we shape the figure in a dice then opposite sides will be as shown below.



Clearly, number 6 will be opposite to number 2.

18. (b); If we shape the figure in a dice then opposite sides will be as shown below.

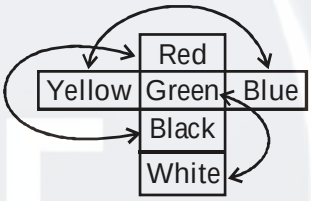


Clearly, symbol 'O' opposite to symbol ÷.

19. (c); If we shape the figure in a dice then opposite side will be as shown below.

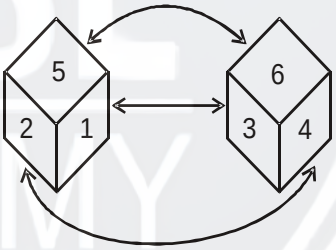
Clearly, symbol ✡ is opposite of symbol Δ.

20. (a); If we shape the figure in a dice then opposite sides will be as shown below.

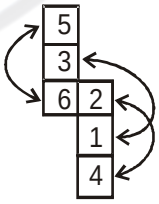


Green colour is opposite to white colour.

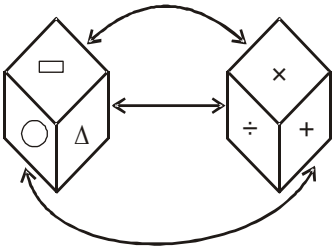
21. (b);



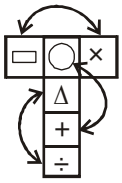
5 will be opposite to 6.
2 will be opposite to 4.
1 will be opposite to 3.



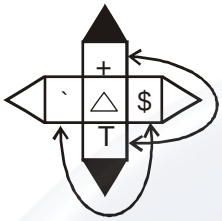
22. (c);



'▭' is opposite to '×'
'◯' is opposite to '+'
'Δ' is opposite to '÷'



23. (b); If we shape the figure into dice then opposite sides will be shown below.

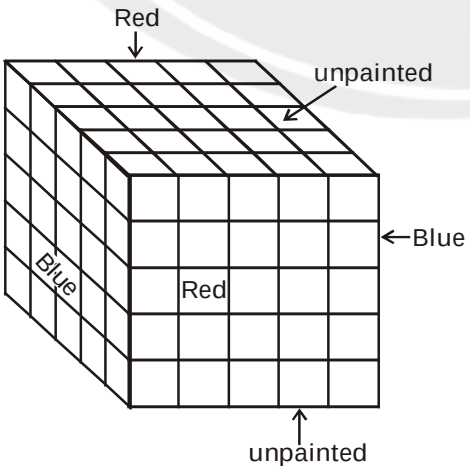


symbol '+' is opposite to 'T'
Symbol '`' is opposite to '$'
symbol 'Δ' is opposite to '  '

Except (2) in all options opposite symbol are shown at the adjacent surfaces.

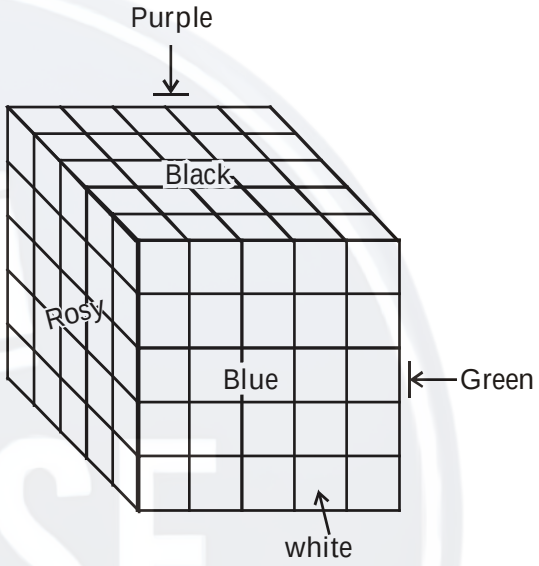
24. (b); We know that number of smaller cubes with three surfaces painted is always 8.
25. (b); Number of smaller cubes with no surface painted $= (n-2)^3$. Here $n = \sqrt[3]{27} = 3$
So, required number $= (3-2)^3 = 1$
26. (c); Number of smaller cubes with two surfaces painted $= (n-2) \times 12$
Here, $n = \sqrt[3]{216} = 6$
So, required number $= (6-2) \times 12 = 4 \times 12 = 48$
27. (a)
28. (b); Here, n = 7
So, required no. $= (7-2) \times 12 = 5 \times 12 = 60$
29. (c); Number of smaller cubes with one surface painted
$(n-2)^2 \times 6 = (7-2)^2 \times 6 = (5)^2 \times 6 = 25 \times 6 = 150$
30. (d); Number of smaller cubes with no surface painted
$= (n=2)^3 = (7-2)^3 = (5)^3 = 125$

(31 to 35)



31. (d); There are 80 cubes painted at least one side. So smaller cubes whose none side is painted are 125 - 80 = 45.
32. (b); Clearly, 20 cubes will have only two surfaces painted with red and blue colours respectvely.
33. (a); Clearly, No such cubes are there coloured with three surfaces because two opposite side of cubes are unpainted.
34. (c);
35. (d); No. of red colour cubes = 50
No. of remaining cubes = 125 – 50 = 75

(36 to 41)



36. (d); Only 4 cubes will have two surfaces painted green and white and remaining side without colour.
37. (a); Clearly 16 cubes will have atleast blue colour on its surface, remaining sides without colour.
38. (a); Clearly 8 cubes there whose one surface is rosy and one surface is either blue or purple.
39. (a); Clearly only 4 cubes are there.
40. (c); Number of smaller cubes with no surface painted $= (n-2)^3$.
Here, $n = \sqrt[3]{216} = 6$
$\therefore$ Required no $= (6-2)^3 = (4)^3 = 64$
41. (a);
42. (a); 'Red' appears in figure (A) along with 'Black' and 'Yellow'. Also 'Black' and 'yellow' appear together in one more figure (C), along with 'indigo'. Hence, 'Indigo' must be opposite 'Red'.
43. (b); The numbers 2, 3, 4 and 5 cannot be on the face oppostie to 1. Therefore, 6 lies opposite to 1.
44. (a); From figure (C) we reject (3) and (4) because green and brown suraces are adjacent surfaces. After a close look at fig (A) and (C) we come to know that red surface is opposite the white surface.

Distinct Solutions

45. (a); 6 appears in one figure (A) along with 3 and 2. 2 and 3 appear together in another figures (C) and (D) along with 1. Hence, 1 must be opposite to 6.

46. (d); 1 appears in one figure along with 4 and 2. 4 and 2 appear together in another figure along with 6. Hence, 6 must be opposite 1.

(47 to 60):

$$n = \frac{15}{3} = 5$$

Total number of cubes = $5^3 = 125$

Cubes having only one face green = $2(n-2)^2 = 2(5-2)^2 = 18$.

Cubes having one face blue = $2(n-2)^2 = 2 \times 3 \times 3 = 18$

Cubes having one face yellow

$= 2(n-2)^2 = 2 \times 3 \times 3 = 18$

Cubes having only one face painted = 18 + 18 + 18= 54

Cubes of only two faces painted comprises three types of cube

1st type: one face blue and one face yellow

$4(5-2) \Rightarrow 4(n-2) = 4 \times 3 = 12$

2nd type: one face yellow and one face green

$4(n-2) \Rightarrow 4(5-2) = 4 \times 3 = 12$

3rd type: one face green and one face blue

$4(n-2) \Rightarrow 4(5-2) = 4 \times 3 = 12$

Cubes having only two faces painted = 12 + 12 + 12 = 36

Cubes which have no face painted = $(n-2)^3 = (5-2)^3 = 3^3 = 27$.

47. (a) 48. (b) 49. (c) 50. (d)
51. (d) 52. (a) 53. (b) 54. (a)
55. (c) 56. (c) 57. (c)

58. (d); Cubes having one face painted blue are 18. Cubes having one face blue and one face green are 12.
Cubes having one face blue and one face yellow are 12.
Cubes having painted with three colours are 8.
Hence total such cubes = 18 + 12 + 12 + 8 = 50.

59. (d);

60. (c);

Previous Year Solutions

1. (c); The symbol of the adjacent faces to the face with symbol * are @, –, + and $. Hence the required symbol is 8.

2. (d); In these two positions one of the common face having 1 point is in the same position. There will be 4 posints on the required face.

3. (a); Here the common faces with number 3, are in same positions. Hence 6 is opposite to 2 and 5 is opposite to 1. Therefore 4 is opposite to 3.

4. (c); Common faces with number 3, are in same positions. Hence the number of the opposite face to face as number 5 will be 6.

5. (d); In first two positions of dice one common face containing 5 is same. The face opposite to the face which contains 2 point, will contains 6 points.

6. (b); As the numbers 2, 3, 4 and 5 are adjacent to 6. Hence the number on the face opposite to 6 is 1.

7. (b); when 'one' is at the top, then 5 will be at the bottom.

8. (a); In these 2 positions one common face with number 1 is in the same position, 2 is opposite 6 and 3 is opposite to 5. therefore opposite to 4 is 1.

9. (c); Here the common faces with 4 dots are in same positions. Hence 2 will be opposite to 5.

10. (d); Here the common faces with 4 dots are in same positions. Hence 2 will be opposite to 1.

11. (c); From position I and III common face with % is in the same position. Hence × is oppositie to +.

12. (c); In these 2 positions one common face with number 3, is in same position. Hence 1 is opposite to 6 and 4 and 4 is opposite to 2. Therefore 5 is opposite to 3.

13. (a); The colours adjacent to yellow are orange, blue, red and rose. Hence violet will be opposite to yellow.

14. (a); Common faces with number 2 are in same positions. Hence when the digit 5 is on the bottom then 1 will on the upper surface.

15. (c); The adjacent faces to the face which have 3 points are 2, 1, 4 and 6 points. Hence 5 points will be on the face opposite to the face which contains 3 points

16. (a); Here one of the two common faces (5) is in the same position, the remaining face with the 4 dots will be opposite to face with dots 2.

17. (c); When 3 points are at the bottom then 4 points will be at the top.

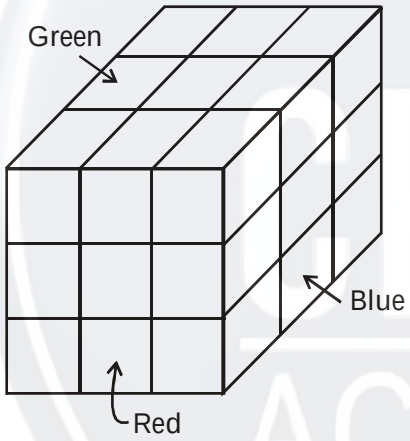
18. (a); The letters of the adacent faces to the face with letter A, are B, F, C and E. Hence D is the letter of the face opposite to the face with letters (A).

19. (d); In given figure D have C, E, B as their adjacent remaining alphabet is A. So it is opposite of D.
20. (b); According to question figure. A is opposite to D, F is opposite to B and E is opposite of C. So only option B can follow the condition.
21. (d); After counting clockwise direction in both diagram 3, 5, 2 and 3, 1, 6 are given so opposite of 2 is 6.
22. (b); After counting clockwise direction in both diagram triangle

3	5	4
3	6	2

so 1 is opposite to 3 triangle.
23. (a); In given four figures the face which contain 6 spots is adjacent of 3, 2, 4, 5, so remaining is 1. Which is opposite to 6.
24. (a); According to the figure 4 have 3, 6, 2, 5 as their adjacent so remaining digit is 1 which is opposite of 4.

(25 to 30)



$$n = \frac{\text{Given side}}{\text{Calculate}} = \frac{15\text{ cm}}{5\text{ cm}} = 3$$

total no. of cubes = $(3)^3 = 27$

3 face coloured = 8

2 face coloured = 12

1 face coloured = 6

Uncoloured = $(n-2)^3 = 1$

25. (b); Coloured with only green colour = 2.
26. (c); Cubes that have at least two colours = 12 + 8 = 20
27. (a); Uncoloured cube = 1.
28. (d); Cube that have red colour = 9 + 9 = 18.
29. (a); Cube that have blue but not with red
= Only blue + blue with green
= 2 + 4 = 6
30. (c); Cubes that having only one face coloured
$= 6(n-2)^3 = 6(3-2)^3 = 6$