Probability, Permutation and Combination

Direction (1 – 5): There are three boxes P, Q and R which consists of Red, Blue and Green colour balls. Total number of blue balls in all three boxes together is 9 and total number of balls in all the boxes together is 32.

In Box P: The probability of choosing a Blue ball is 1/4 and the number of red balls is 2 more than the number of blue balls.

In Box Q: Total number of balls is 10 and the ratio of probability of getting a Blue and a Red ball is 2 : 3. Also the sum of Blue and Green balls is 4 more than the number of red balls.

In Box R: Total number of balls is 10 and the probability of getting a red is 1/5 less than the probability of getting a blue.

1. Find the ratio of sum of Red balls in boxes P & R and the sum of Green balls in Boxes Q and R.
(A) 9 : 8   **(B)** 7 : 9
(C) 8 : 5   **(D)** 3 : 2
(E) 2 : 3

2. What is the probability of getting either a blue or a green ball from box R.
(A) 3/5   **(B)** 2/5
(C) 4/5   **(D)** 7/10
(E) 1/2

3. One ball each is drawn from each box. Find the probability that all are of red colour.
(A) 1/40   **(B)** 1/24
(C) 3/50   **(D)** 4/15
(E) 1/30

4. What is the difference of probability of drawing a green ball from box Q and the probability of drawing a blue ball from box R?
(A) 0.2   **(B)** 0.5

(C) 0.4   **(D)** 0.1
(E) 0.3

5. If 'x' red balls are shifted from each of the boxes P and R to box Q then probability of drawing a red ball from box Q increases by 7/60. Find the value of x.
(A) 2   **(B)** 4
(C) 3   **(D)** 5
(E) 1

6. A box contains 50 balls, in which 5 are red balls, 6 are green balls, 9 are blue balls, and the remaining are yellow balls.
Quantity I: Probability of picking 2 balls such that one is green and the other one is blue
Quantity II: Probability of picking 3 balls such that at least one of them is red
Quantity III: Probability of picking 3 balls such that at least one of them is blue
(A) Quantity III > Quantity I > Quantity II
(B) Quantity II > Quantity III > Quantity I
(C) Quantity III > Quantity II > Quantity I
(D) Quantity I = Quantity II > Quantity III
(E) Quantity I > Quantity III < Quantity II

7. A bag contains four white and six black balls. If three balls are chosen from the bag at random, then what is the probability that all are white?
(A) 1/10   **(B)** 1/30
(C) 1/25   **(D)** 1/20
(E) none of these

8. Calculate the probability of forming different words in which letters of word **ABJURED** can be arranged so that vowels always occur together.
(A) 1/6   **(B)** 3/35
(C) 1/9   **(D)** 1/7
(E) 5/7

9. In a bag, there are 6 red balls, 6 orange balls, and x green balls. The probability of getting the green ball is 1/4.
Quantity A: x
Quantity B: 4
(A) Quantity A > Quantity B
(B) Quantity A < Quantity B
(C) Quantity A ≥ Quantity B
(D) Quantity A ≤ Quantity B
(E) Quantity A = Quantity B or relationship cannot be determined.

10. 3 girls and 4 boys are to be seated in a row on 7 chairs in such a way that all the three girls always sit together. In how many different ways can it be done ?
(A) 720 **(B)** 576
(C) 144 **(D)** 480
(E) None of these

11. In bag A there are 5 red balls, X green balls and 7 yellow balls. Probability of drawing one green ball from bag A is 2/5. In bag B there are (X – 3) red balls, (X – 4) green balls and 6 yellow balls. 2 balls are drawn from bag B. Find the probability that both the balls are red colour?
(A) 2/23 **(B)** 3/21
(C) 4/21 **(D)** 2/21
(E) 5/21

12. In a bag, there are 8 black balls and 12 yellow and green balls. If the probability of choosing a green ball from the bag is 0.35 then, find the probability of choosing two yellow balls from the bag if the ball chosen is not replaced.
(A) 2/19 **(B)** 4/95
(C) 1/19 **(D)** 6/95
(E) None of these

13. In a bag, there are 30 balls of three different colors i.e. red, blue and brown. Number of red balls are 6 more than that of blue and ratio of number of red to brown balls is 7 : 4.

If all blue balls are taken away then find the probability of getting 3 red balls out of the remaining balls in the bag.
(A) 13/66 **(B)** 1/5
(C) 26/105 **(D)** 13/55
(E) None of these

14. There are five mangos and six oranges in a bucket. What will be probability of Picking up four fruits which contains at least two orange?
(A) 53/66 **(B)** 43/66
(C) 59/66 **(D)** 49/66
(E) 3/5

Direction (15–17): Study the following information carefully and answer the questions given below.

A box contains 2 blue caps, 4 red caps and 5 green caps and one yellow cap.

15. If one cap is picked at random, what is the probability that it is either blue or yellow ?
(A) 2/9 **(B)** 1/4
(C) 3/8 **(D)** 6/11
(E) None of these

16. If two caps are picked at random, what is the probability that at least one is red ?
(A) 1/3 **(B)** 16/21
(C) 19/33 **(D)** 7/19
(E) None of these

17. If three caps are picked at random, what is the probability that two are red and one is green ?
(A) 9/22 **(B)** 6/19
(C) 1/6 **(D)** 3/22
(E) None of these

18. A box contains 5 blue, 3 green and 4 red balls. 2 balls are drawn from the box at random. What is the probability that both the balls are of the same colour?

` **(A)** 23/66 **(B)** 19/66
(C) 7/66 **(D)** 7/23
(E) None of these

19. In a bag there are 3 magenta balls, 5 green balls and 7 blue balls. 2 balls are drawn one by one without replacement. If the first ball comes out to be of magenta colour, then 8 more magenta coloured balls are added to bag. Find the probability that both the balls drawn are of magenta colour.
(A) 1/35 **(B)** 2/11
(C) 1/11 **(D)** 2/23
(E) None of these

20. A box contains 4 Red balls, 6 white balls, 2 orange balls and 8 black balls.
Quantity I: Two balls are drawn at random probability that both balls are either red or white.
Quantity II: Three balls are drawn. The probability that all are different.
(A) Quantity I > Quantity II
(B) Quantity I < Quantity II
(C) Quantity I Quantity II
(D) Quantity I = Quantity II
(E) No relation