

Quiz Date: 28th March 2020

Q1. Out of 3 women and 6 men a committee of three members is to be formed in such a way that at least one member is a woman. In how many different ways can it be done?

- (a) 64
- (b) 60
- (c) 66
- (d) 56
- (e) None of these

Q2. A school team has 8 volleyball players. A five members team and a captain will be selected out of these eight players. How many different selections can be made?

- (a) 224
- (b) 112
- (c) 56
- (d) 88
- (e) 168

Q3. A box contains two red, three green and four blue balls. In how many ways can three balls be drawn from the box if atleast one green ball is to be included in the draw ?

- (a) 23
- (b) 64
- (c) 46
- (d) 76
- (e) 56

Q4. A dice is rolled twice what is the probability that the number in the second roll will be lesser than that in the first?

- (a) $\frac{1}{4}$
- (b) $\frac{1}{2}$
- (c) $\frac{7}{12}$
- (d) $\frac{5}{12}$
- (e) $\frac{1}{6}$

Q5. In a class there are two sections i.e. A and B. 25% of the students in section A and $44\frac{4}{9}\%$ of the students in section B are girls. If two students are chosen at random one each from section A and section B as class representative then find the probability that there will be exactly one boy out of chosen two students?

- (a) $\frac{17}{36}$
- (b) $\frac{13}{36}$

- (c) $\frac{1}{2}$
(d) $\frac{7}{18}$
(e) $\frac{4}{9}$

Directions (6-7): Study the following information carefully to answer the questions that follow :

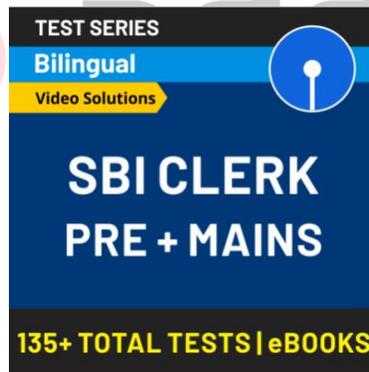
A box contains 2 blue caps, 4 red caps, 5 green caps and 1 yellow cap.

Q6. If four caps are picked at random, what is the probability that none is green ?

- (a) $\frac{7}{99}$
(b) $\frac{5}{99}$
(c) $\frac{7}{12}$
(d) $\frac{5}{12}$
(e) $\frac{98}{99}$

Q7. If two caps are picked at random, what is the probability that both are blue ?

- (a) $\frac{1}{6}$
(b) $\frac{1}{10}$
(c) $\frac{1}{12}$
(d) $\frac{1}{45}$
(e) None of these



Q8. In a box carrying 1 dozen of mangoes one-third have become bad. If 3 mangoes are taken out from the box at random, what is the probability that at least one mango out of the three mangoes picked up is good?

- (a) $\frac{3}{55}$
(b) $\frac{1}{55}$
(c) $\frac{54}{55}$
(d) $\frac{45}{55}$
(e) $\frac{52}{55}$

Q9. In how many ways can a committee of 5 members be made out of 6 men and 4 women containing atleast one woman?

- (a) 246
- (b) 222
- (c) 186
- (d) 286
- (e) 256

Q10. Everybody in a room shakes hands with everyone else. If total number of hand-shakes is 66, then number of persons in the room is

- (a) 11
- (b) 12
- (c) 13
- (d) 14
- (e) 17

Direction (11-15): Study the passage and answer the following question.

Management team of Adda247 has 12 employees - 4 in each of Marketing, Finance and HR team. Oldest employee is 62 years old and is employee of HR team, while youngest employee is 28 years old and he/she is employee of marketing team. Average age of whole marketing team is same as the individual age of two of its employees, two employees from HR team and one employee from Finance team. Average age of Finance team is 12.5% more than that of HR team. One employee of HR team is 8 years older than other two. Two employees of finance team have same age as the average of youngest and eldest employee of Adda247. Average age of Finance team is 50% more than that of Marketing team. All units are given in years unless mentioned.

Q11. What is the average age of 3 eldest employees in Management team?

- (a) $48 \frac{2}{3}$
- (b) $47 \frac{1}{3}$
- (c) $50 \frac{1}{3}$
- (d) $51 \frac{1}{3}$
- (e) None of these

Q12. If youngest employee of HR team replaces eldest employee of Finance team, what will be the new average age of Finance team?

- (a) 37.5
- (b) 40.5
- (c) 32.5
- (d) 40
- (e) None of these

Q13. If a new employee of age 60 years joins Marketing team, what will be the new average of Marketing team?

- (a) 30

- (b) 32
- (c) 34
- (d) 36
- (e) 38

Q14. What is difference between overall average age of Management team and average age of Finance team?

- (a) $1\frac{2}{3}$
- (b) $7\frac{1}{3}$
- (c) $7\frac{2}{3}$
- (d) $6\frac{2}{3}$
- (e) None of these

Q15. Two employees with their age ratio 9 : 7 joins the HR team, and average age of HR team remains same, what is difference between age of eldest and second eldest employee of Management team?

- (a) 27
- (b) 02
- (c) 05
- (d) 17
- (e) None of these



Solutions

S1. Ans.(a)

Sol. No. of ways when none is women = $6C_3 = 20$

Total possible way = $9C_3 = 84$

Required ways = $84 - 20 = 64$.

S2. Ans.(e)

Sol.

Required selections

$$= \begin{matrix} {}^8C_1 & \times & {}^7C_5 \\ \downarrow & & \downarrow \\ \text{Captain} & & \text{Members} \end{matrix}$$

$$= 8 \times \frac{7 \times 6}{2} = 168$$

S3. Ans (b)

Sol. The total number of balls in the box = $2 + 3 + 4 = 9$

Total number of selections of 3 balls out of 9 balls = 9C_3

Number of selections in which no green ball is selected = 6C_3

Required number of sections = ${}^9C_3 - {}^6C_3 = 64$

S4. Ans.(d)

Sol.

When dice is rolled two times

Total number of possibilities = 36 (i.e. 6^2)

Desired possibilities = ${}^6C_2 \times 1$

(i.e. two number are selected for two rolls)

1 → No. of way to arrange number in descending orders.

$$\therefore \text{Required probability} = \frac{{}^6C_2}{36} = \frac{5}{12}$$

S5. Ans(a)

Sol: let in section = A and B
 Total no of students = 4x and 9y
 No of boys = 3x and 5y
 No of girls = x and 4y

Here we have two cases

Case 1: when boy is chosen from section A and girl is from section B

$$\text{Probability} = \frac{3}{4} \times \frac{4}{9} = \frac{1}{3}$$

Case 2: when boy is chosen from section B and girl is chosen from section A

$$\text{Probability} = \frac{5}{9} \times \frac{1}{4} = \frac{5}{36}$$

$$\text{Required probability} = \frac{1}{3} + \frac{5}{36} = \frac{17}{36}$$

S6. Ans (a)

Sol. Reqd. Probability is when all caps chosen are blue, red or yellow. Which is equal to

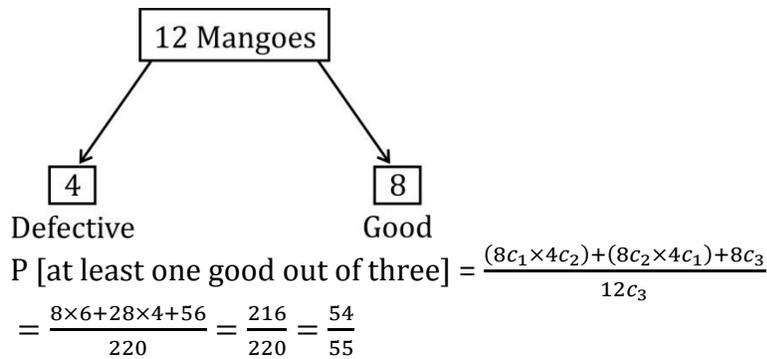
$$= \frac{{}^7C_4}{{}^{12}C_4} = \frac{7!4!8!}{4!3!12!} = \frac{7}{99}$$

S7. Ans (e)

$$\text{Sol. Reqd. Probability} = \frac{{}^2C_2}{{}^{12}C_2} = \frac{\frac{2!}{2!0!}}{\frac{12!}{10!12!}} = \frac{1}{66}$$

S8. Ans.(c)

Sol.



S9. Ans.(a)

Sol.

6 men, 4W

Required no. of ways

= (4M & 1W) or (3M & 2W) or (2M & 3W) or (1M & 4W)

= ${}^6C_4 \times {}^4C_1 + {}^6C_3 \times {}^4C_2 + {}^6C_2 \times {}^4C_3 + {}^6C_1 \times {}^4C_4$

= $\frac{6 \times 5}{2} \times 4 + \frac{6 \times 5 \times 4}{3 \times 2} \times \frac{4 \times 3}{2} + \frac{6 \times 5}{2} \times 4 + 6 \times 1$

= $60 + 20 \times 6 + 15 \times 4 + 6$

= 246



S10. Ans.(b)

Sol.

Total no. of hand shakes = $n_{C_2} = 66$

$\frac{n!}{(n-2)! \cdot 2!} = 66$

$n^2 - n - 132 = 0$

$(n-12)(n+11) = 0$

$n = 12$

S (11-15)

From the information, average age of Marketing team is same as individual age of 5 employees.

Let us consider average age of Marketing team is x(i)

∴ age of 2 employees of HR team is also x.

and age of 1 employee of Finance team is also x.

and age of 2 employee of Marketing team is also x.

Let the average age of HR team is $8y$... (ii)

Therefore, average age of Finance team is $\left(\frac{100+12.5}{100}\right) 8y = 9y$... (iii)

Till now we have the information, that age of 3 employees of HR team is 62, x and x.

Therefore, from the condition, that one employee of HR team is 8 years older than other two.

So, age of 4th employee from HR team is $(x + 8)$ [As age 62 was highest]

Now we can say that

$$\frac{62+x+x+x+8}{4} = 8y$$

$$\Rightarrow \frac{70+3x}{4} = 8y \text{ ... (iv)}$$

Age of two employees of Finance team is $\frac{62+28}{2} = 45$ years.

From the last statement,

$$\text{Average age of Finance team} = \left(\frac{100+50}{100}\right) x = \frac{3}{2}x \text{ ... (v)}$$

From eqn. (v) and eqn. (iii)

$$9y = \frac{3}{2}x$$

$$\Rightarrow x = 6y \text{ or } y = \frac{x}{6}$$

Put this value in eqn. (iv)

$$\Rightarrow \frac{70+3x}{4} = 8 \times \frac{x}{6}$$

$$\Rightarrow 70 + 3x = \frac{16}{3}x$$

$$\frac{7x}{3} = 70 \Rightarrow x = 30$$

Therefore, age of 4 persons of HR team is

62, 38, 30 and 30.

Now average age of Finance team $\Rightarrow \frac{3}{2}x = 45$

Total age = $45 \times 4 = 180$

2 employees of finance team have age of 45 and 1 employee of finance team have age of 30,

then the 4th employee's age of finance team = $180 - (45 + 45 + 30)$

= 60

Therefore, age of 4 employees of Finance team is 45, 45, 60 30.

Similarly age of 4th employee of Marketing team = $30 \times 4 - (30 + 30 + 28)$

= 32 years.

Therefore,

HR	62	38	30	30
Marketing	32	30	30	28
Finance	60	45	45	30

S11. Ans.(e)

Sol.

$$\text{Required average} = \frac{62+60+45}{3} = \frac{167}{3} = 55 \frac{2}{3}$$

Hence none of these

S12. Ans.(a)

Sol.

$$\begin{aligned} \text{Required average} &= \frac{30+45+45+30}{4} \\ &= \frac{150}{4} = 37.5 \text{ year} \end{aligned}$$

S13. Ans.(d)

Sol.

$$\begin{aligned} \text{Required average} &= \frac{32+30+30+28+60}{5} \\ &= \frac{180}{5} = 36 \text{ years} \end{aligned}$$

S14. Ans.(d)

Sol.

$$\begin{aligned} \text{Overall average age of Adda247} \\ &= \frac{62+38+30+30+32+30+30+28+60+45+45+30}{12} \end{aligned}$$

$$= \frac{460}{12} = 38\frac{1}{3}$$

$$\text{Average age of Finance} = \frac{60+45+45+30}{4}$$

$$= 45 \text{ years}$$

$$\text{Required difference} = 45 - 38\frac{1}{3} = 6\frac{2}{3} \text{ years}$$

S15. Ans.(b)

Sol.

Let their age be $9x$ and $7x$.

$$\text{So, } \frac{62+38+30+30+9x+7x}{6} = 40$$

$$16x = 240 - 160$$

$$16x = 80$$

$$x = 5$$

therefore, their age are 45 and 35 years.

But still highest two age in Adda247 are 62 and 60.

So, required difference is 2 years.

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