

Quiz Date: 2nd March 2020

Q1. There are 5 multiple choice questions in an examination. How many sequences of answers are possible, if the first three questions have 4 choices each and the next two have 6 choices each?

- (a) 2804
- (b) 3456
- (c) 7776
- (d) 2304
- (e) 1024

Q2. How many 4 digits number can be formed using 2, 3, 5, 7, 6 and 9 if the number should be divisible by '4' and repetition is not allowed?

- (a) 120
- (b) 96
- (c) 160
- (d) 64
- (e) 296

Q3. How many four-digit numbers can be formed from digits 0, 2, 4, 6, 5, 1 such that each number is divisible by 5 and no repetition is allowed?

- (a) 48
- (b) 108
- (c) 60
- (d) 100
- (e) 90

Q4. A box contains 30 eggs out of which 6 are rotten. Two eggs are chosen at random. What is the probability that only one of the chosen eggs is rotten ?

- (a) $\frac{53}{145}$
- (b) $\frac{63}{145}$
- (c) $\frac{51}{145}$
- (d) $\frac{57}{145}$
- (e) $\frac{48}{145}$

Q5. Arun and Veer go for an interview for two different vacancies. The probability of selection of Arun is $\frac{2}{5}$ whereas the probability of the selection of Veer is $\frac{3}{4}$. What is the probability that only one of them is selected?

- (a) $\frac{9}{20}$
- (b) $\frac{7}{20}$
- (c) $\frac{11}{20}$
- (d) $\frac{13}{20}$

(e) None of these

Q6. How many 3 digit numbers which are divisible by 5, with no repetition of digits can be formed by using the digits 0, 2, 4, 5, 7 and 8?

(a) 24

(b) 20

(c) 16

(d) 36

(e) None of these

Q7. In a bag there are three color balls black, brown and blue. Number of balls of black color is 6 more than no. of balls of brown color. If one ball is drawn from the bag then probability of getting blue is $\frac{3}{11}$. Find the no. of black color ball if possibility of getting black ball is $\frac{5}{11}$.

(a) 12

(b) 6

(c) 10

(d) 5

(e) 15

Q8. Three shooter having probability of shot a target $\frac{1}{3}$, $\frac{2}{5}$ and $\frac{3}{7}$ respectively. What is the probability that exactly one of them did not hit the target?

(a) $\frac{12}{35}$

(b) $\frac{29}{105}$

(c) $\frac{19}{35}$

(d) $\frac{41}{105}$

(e) $\frac{1}{5}$

Q9. A box contains 2 blue balls, 4 red balls, 5 green balls and 1 yellow balls. If two balls are picked at random, what is the probability that at most 1 ball is blue?

(a) $\frac{1}{6}$

(b) $\frac{1}{10}$

(c) $\frac{1}{12}$

(d) $\frac{34}{45}$

(e) $\frac{65}{66}$

Q10. Two boxes contain 4 and 16 balls respectively. Two balls in the first box and four in the second box are black. If a box is chosen randomly and two balls are drawn at random from it, what is the probability that at least one ball is black ?

(a) $\frac{11}{20}$

(b) $\frac{43}{120}$

- (c) $\frac{77}{120}$
 (d) $\frac{9}{20}$
 (e) $\frac{7}{23}$



Q11. Two school participate in a debate competition. From school A, six boys and two girls participated and from school B, six boys and eight girls participated. If first and second position got by same schools, then what is probability of students got first and second position in debate competition are different gender ?

- (a) $\frac{67}{182}$
 (b) $\frac{77}{182}$
 (c) $\frac{97}{182}$
 (d) $\frac{56}{187}$
 (e) $\frac{87}{182}$

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Q12. Three mountaineers Amit, Vinit and Nishit are climbing up a mountain with their respective probabilities of reaching the summit being $\frac{1}{3}$, $\frac{1}{5}$ and $\frac{1}{4}$ respectively. What is the probability that Exactly one of them reaches the Summit?

- (a) $\frac{13}{30}$
 (b) $\frac{17}{30}$
 (c) $\frac{19}{30}$
 (d) $\frac{11}{30}$
 (e) $\frac{23}{30}$

Q13. A box contains 2 tennis, 3 cricket and 4 squash balls. Three balls are drawn in succession with replacement. Find the probability that all are cricket balls.

- (a) $\frac{1}{27}$
 (b) $\frac{2}{27}$
 (c) $\frac{25}{27}$
 (d) $\frac{1}{8}$

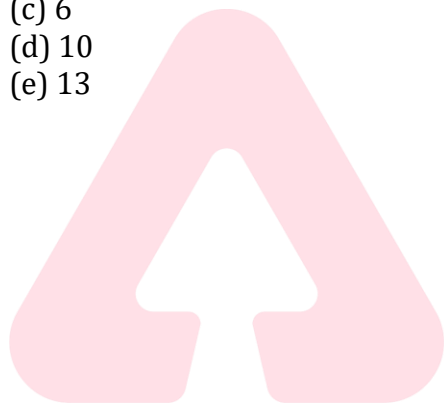
(e) None of these

Q14. 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) $\frac{53}{66}$
 (b) $\frac{43}{66}$
 (c) $\frac{59}{66}$
 (d) $\frac{49}{66}$
 (e) $\frac{3}{5}$

Q15. Probability of getting one Red ball from a bag full of balls is $\frac{2}{13}$ and Black balls in the bag is 5. If white ball is 30% less than Brown ball and 40% more than the black balls then find the number of Red balls.

- (a) 5
 (b) 4
 (c) 6
 (d) 10
 (e) 13



Solutions

S1. Ans.(d)

Sol.

Places: - - - - -

Digits: 4 4 4 6 6

Total number of sequences = $4 \times 4 \times 4 \times 6 \times 6 = 2304$.

S2. Ans.(b)

Sol.

The number which should be divisible by 4 will end with 32, 52, 72, 92, 36, 56, 76 and 96
 (Total 8 ways)

Starting two numbers can be chosen in $4 \times 3 = 12$ ways

Total no. of ways = $12 \times 8 = 96$ ways

S3. Ans. (b)

Sol.

Numbers with end digit 0

$$= \begin{array}{ccc} \downarrow & \downarrow & \downarrow \\ 5 & \times & 4 & \times & 3 & = 60 \\ & & & & & 0 \end{array}$$

Number with end digit 5.

$$\begin{array}{ccc} \downarrow & \downarrow & \downarrow \\ 4 & \times & 4 & \times & 3 & = 48 \\ & & & & & 5 \end{array}$$

(excluding 0)

Total no's = 60+48 = 108

S4. Ans.(e)

Sol.

$$\begin{aligned} \text{Required probability} &= \frac{{}^6C_1 \times {}^{24}C_1}{{}^{30}C_2} \\ &= \frac{6 \times 24}{\frac{30 \times 29}{2}} \\ &= \frac{432}{435} \\ &= \frac{48}{145} \end{aligned}$$

S5. Ans.(c)

Sol.

Probability of only one of them being selected

= (Probability of Arun being selected and Veer not being selected) + (Probability of Arun not being selected and Veer being selected)

$$\begin{aligned} &= \left(\frac{2}{5} \times \frac{1}{4} \right) + \left(\frac{3}{5} \times \frac{3}{4} \right) \\ &= \frac{2}{20} + \frac{9}{20} \\ &= \frac{11}{20} \end{aligned}$$



S6. Ans.(d)

Sol.

A number is divisible by 5 if the unit digit of the number is either 0 or 5.

Number of 3 digit numbers with no repetition of digits formed by using the digits 0, 2, 4, 5, 7 and 8:

With 0 as unit digit = $5 \times 4 \times 1 = 20$

With 5 as unit digit = $4 \times 4 \times 1 = 16$ (\because 0 cannot occupy hundred's place)

Hence, total numbers = $20 + 16 = 36$

S7. Ans.(e)

Sol.

Probability of getting blue and black ball $3/11$ and $5/11$ respectively.

Let total ball $\rightarrow 11y$

Blue balls $\rightarrow 3y$

Black balls $\rightarrow 5y$

Brown balls $\rightarrow 3y$

ATQ,

$$5y - 3y = 6$$

$$y = 3$$

Black balls $\rightarrow 15$

S8. Ans.(b)

Sol.

Required probability

$$= \frac{1}{3} \times \frac{2}{5} \times \frac{4}{7} + \frac{1}{3} \times \frac{3}{7} \times \frac{3}{5} + \frac{2}{5} \times \frac{3}{7} \times \frac{2}{3}$$

$$= \frac{29}{105}$$

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S9. Ans.(e)

Sol. Required probability = $\frac{10C_1 2C_1 + 10C_2}{12C_2} = \frac{65}{66}$

S10. Ans.(c)

Sol.

At least one black can be chosen in three ways:

1. first one is black, second is non-black

2. first one is non-black, second is black

3. both are black.

Probability of selecting a box is $\frac{1}{2}$

Now, probability of choosing at least one black ball from first box = $\frac{1}{2} \times \left(\frac{2}{4} \times \frac{2}{3} + \frac{2}{4} \times \frac{2}{3} + \frac{2}{4} \times \frac{1}{3} \right) = \frac{5}{12}$

Probability of choosing at least one black ball from 2nd box = $\frac{1}{2} \times \left(\frac{4}{16} \times \frac{12}{15} + \frac{12}{16} \times \frac{4}{15} + \frac{4}{16} \times \frac{3}{15} \right)$
 $= \frac{27}{120}$

Required probability = $\frac{5}{12} + \frac{27}{120} = \frac{50+27}{120} = \frac{77}{120}$

S11. Ans.(e)

Sol.

Probability of both first and second position got by same school

$$= \frac{1}{2}$$

Probability of both first and second position got by two different gender from school A

$$= \frac{{}^6C_1 \times {}^2C_1}{{}^8C_2}$$

$$= \frac{6 \times 2}{28}$$

$$= \frac{3}{7}$$

Probability of both first and second position got by two different gender from school B

$$= \frac{{}^6C_1 \times {}^8C_1}{{}^{14}C_2}$$

$$= \frac{6 \times 8}{91}$$

$$= \frac{48}{91}$$

$$\text{Required probability} = \frac{1}{2} \times \frac{3}{7} + \frac{1}{2} \times \frac{48}{91}$$

$$= \frac{3}{14} + \frac{48}{182}$$

$$= \frac{39+48}{182}$$

$$= \frac{87}{182}$$

S12. Ans.(a)

$$\text{Sol. Required probability} = \frac{1}{3} \times \frac{4}{5} \times \frac{3}{4} + \frac{2}{3} \times \frac{1}{5} \times \frac{3}{4} + \frac{2}{3} \times \frac{4}{5} \times \frac{1}{4} = \frac{13}{30}$$

S13. Ans.(a)

$$\text{Sol. First is cricket ball, second is cricket ball and third is cricket ball} \rightarrow (3/9) \times (3/9) \times (3/9)$$

$$= (1/27)$$

S14. Ans.(a)

Sol.

Favorable case = (20, 2M) or (30, 1M) or 40

∴ Probability

$$= \frac{{}^6C_2 \times {}^5C_2}{{}^{11}C_4} + \frac{{}^6C_3 \times {}^5C_1}{{}^{11}C_4} + \frac{{}^6C_4}{{}^{11}C_4}$$

$$= \frac{15 \times 10}{330} + \frac{20 \times 5}{330} + \frac{15}{330}$$

$$= \frac{265}{330} = \frac{53}{66}$$

S15. Ans.(b)

Sol.

Let number of red balls is 2x

Total balls = 13x

Now ATQ

Black balls = 5

$$\text{White balls} = \frac{5 \times 140}{100} = 7$$

$$\text{Brown balls} = \frac{7}{70} \times 100 = 10$$

$$\text{Now} \rightarrow 2x + 5 + 7 + 10 = 13x$$

$$x = 2$$

$$\text{Red balls} = 4$$



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