

Probability Questions for SBI PO Pre, IBPS PO Pre, SBI Clerk Mains, IBPS Clerk Mains & LIC AAO Exams. Direction: Read the following questions carefully and choose the right answer. 1. The names of 5 students from section A, 6 students from section B and 7 students from section C were selected. The age of all the 18 students was different. Again, one name was selected from them and it was found that it was of section B. What was the probability that it was the youngest student of the section B? A. $\frac{1}{18}$ B. $\frac{1}{15}$ C. $\frac{1}{4}$ D. $\frac{1}{12}$ E. None of these 2. A bag contains 35 balls of three different colors viz. red, orange and pink. The ratio of red balls to orange balls is 3 : 2, respectively and probability of choosing a pink ball is 3/7. If two balls are picked from the bag, then what is the probability that one ball is orange and one ball is pink? B. $\frac{60}{119}$ C. $\frac{96}{595}$ D. $\frac{3}{17}$ A. $\frac{24}{119}$ E. None of these There are total 18 balls in a bag. Out of them 6 are red in colour, 4 are green in colour 3. and 8 are blue in colour. If Vishal picks three balls randomly from the bag, then what will be the probability that all the three balls are not of the same colour? A. $\frac{95}{102}$ C. $\frac{21}{26}$ D. $\frac{46}{51}$ B. 19 73 E. $\frac{9}{11}$ 4. Ram and Shyam are playing chess together. Ram knows the two rows in which he has to put all the pieces in but he doesn't know how to place them. What is the probability that he puts all the pieces in the right place? A. $\frac{8!}{16!}$ B. $\frac{8!}{(2x15!)}$ C. $\frac{8!}{15!}$ D. $\frac{(2 \times 8!)}{16!}$ E. None of these A child paints the six faces of a cube with six different colors red, blue, pink, yellow, 5. green and orange. What is the probability that red, pink and blue faces share a common corner? A. $\frac{1}{6}$ B. $\frac{1}{20}$ C. $\frac{1}{10}$ $D.\frac{1}{5}$ E. None of these

- 6. Three children took part in racing competition in their school with their respective probabilities to reach the finishing point being 1/3, 1/5 and 1/4 respectively. What is the probability that at least one of them will finish the race?
- A. $\frac{2}{5}$ B. $\frac{3}{5}$ C. $\frac{1}{5}$ D. $\frac{1}{4}$ E. $\frac{3}{4}$

C. 10

A tiffin box contains x pink and (x – 4) yellow toffees and another tiffin box contains (x – 1) yellow and (x – 3) pink toffees. If one of the tiffin box is selected at random and 2 toffees are drawn at random from the box thus selected, the probability that the two toffees are of different colours is 67/132. Find the total number of toffees in the first tiffin box?

D. 16

E. 14

- A. 8 B. 12
- 8. Aarti gave her project assignment to a shopkeeper for binding. There were 19 pages including a cover page, 12 pages of theory and 6 pages of drawings. She told the shopkeeper that the theory pages are in a particular order and the drawing pages can be arranged anywhere provided they are together. If the cover page is always kept first what is the probability that rest of the pages are arranged as per requirement?
- A. ${}^{12}C_1 \times 6! / 18!$ B. ${}^{13}C_1 \times 6! / 19!$ C. $13 \times 40 / 17!$ D. $13! \times 6! / 18!$ E. None of these
- 9. If the letters of the word "CRACKJACK" are rearranged in a random manner, what is the probability that vowels are neither together nor at the ends?
- A. $\frac{11}{18}$ B. $\frac{1}{2}$ C. $\frac{7}{36}$ D. $\frac{5}{12}$ E. None of these
- **10.** A basketball game is played between team Blue and Red. There are a total of 9 players in each team and 5 will play in the game. Ankit is in team blue and Vaibhav is in team Red. What is the probability that at least one of ankit or vaibhav is in playing five?
- A. $\frac{125}{153}$ B. $\frac{65}{81}$ C. $\frac{56}{81}$ D. $\frac{72}{81}$ E. None of these
- 11. Three identical dices are rolled together, what is the probability that the product of all three outcomes on the three dices will be even?
- A. $\frac{5}{18}$ B. $\frac{3}{4}$ C. $\frac{7}{8}$ D. $\frac{1}{8}$ E. None of these

- 12. A goldsmith has a bag, which contains some colourful stones. It contains 4 White and 8 Black stones. There is another bag which contains 5 White and 5 Black stones. One stone is to drawn from either of the two bags. What is the probability of drawing a White stone?
- C. $\frac{5}{12}$ D. $\frac{11}{12}$ A. $\frac{7}{13}$ B. $\frac{8}{13}$ E. None of these 13. A bag has 9 balls – each of them is either white, yellow or Black. In every trial, one ball is drawn and put back in the bag before the next trial. The probability of getting a white ball in two consecutive trials is 1/81. The probability of getting two yellow balls in two consecutive trials is 4/9. What is the probability of getting balls of three different colours in three consecutive trials? B. $\frac{4}{243}$ C. $\frac{4}{9}$ D. $\frac{8}{27}$ A. $\frac{4}{81}$ E. None of these 14. Two cards are drawn simultaneously from a well shuffled pack of cards. Find the probability of both being Honor cards. B. $\frac{29}{221}$ C. $\frac{20}{221}$ D. $\frac{23}{663}$ A. $\frac{2}{221}$ E. None of these In a box there are 5 blue, x green, (x+2) red and 6 black balloons. Probability of 15. choosing one green balloon from the given box is 1/3. What is the sum of the number of green, red and black balloons? A. 24 B. 34 C. 30 D. 28 E. 32 16. When two dice are thrown simultaneously, what is the probability that the sum of the scores on the dice is less than or equal to 4? B. $\frac{1}{18}$ C. $\frac{5}{36}$ D. $\frac{1}{12}$ E. $\frac{5}{18}$ A. $\frac{1}{6}$ Amit and Anit rolled a dice with three faces colored with red and three faces colored 17. with yellow until one of them gets red and loses the game. Find the probability of Anit losing the game if Amit starts the game? A. $\frac{2}{7}$ B. $\frac{1}{12}$ C. $\frac{1}{2}$ $D.\frac{3}{6}$ E. Can't be determined

An eight face biased die is rolled three times. Die is biased in such a way that the 18. probability of getting any number is proportional to square of that number. What is the probability of getting first three even numbers consecutively? A. $\frac{4}{14739}$ B. $\frac{7}{14739}$ C. $\frac{3}{3468}$ D. $\frac{5}{58956}$ E. None of these 19. A box contains certain number of balls of Black, White and Pink Colors in the ratio 6 : 9 : 20. If two balls are drawn randomly and probability of getting both the balls as Pink is 52/161, then find the number of Black Balls. A.12 B. 18 C. 24 D. 6 E. Can't be determined 20. In a school, class1 had 12 football players, class2 had 15 football players, class 3 had 8 football players and class 4 had 5 football players. If one single football player is to be selected for interschool football match then what is the probability that the player is either from class 2 or class 3? B. $\frac{11}{20}$ A. $\frac{1}{2}$ C. $\frac{23}{40}$ D. $\frac{3}{5}$ E. None of these In a rummy game, 3 cards are drawn from a pack of 52 cards. What is the probability 21. that all the three cards are of red colour? C. $\frac{2}{17}$ C. $\frac{2}{13}$ C A. $\frac{3}{52}$ B. $\frac{3}{26}$ 22. Five boys and some number of girls are sitting in a row. The probability that all girls are sitting together is 1/42. What is the total number of girls in the group? A. 2 B. 5 C. 6 D. 7 F. None of these 23. From group of 3 boys and x girls, one student is selected at random for Interschool quiz competition. The probability that the selected student is girl is 4/7. If three students are selected at random then what is the probability that two are girls and one is boy? A. $\frac{17}{35}$ B. $\frac{1}{7}$ C. $\frac{18}{35}$ D. $\frac{3}{5}$ E. None of these 24. In a forest, there are some venomous snakes and some non-venomous snakes. An ayurvedic company executive goes to the forest to catch some venomous snakes then the probability that one venomous snake is caught is 2/17. If in the forest there are total 153 snakes, then how many non – venomous snakes are there in the forest? A. 134 B. 133 C. 135 D. 149 E. None of these

25.	Two friends Ram and Sham can be selected and 20% probability that none of the	probability that	Sham can be sel			
A.85%	6 B. 40%	C. 62.5%	D. 60%	E. None of these		
26.	If four coins are tossed toge	ether, what is th	e probability of at	least getting 2 heads?		
A. $\frac{13}{16}$	B. $\frac{11}{16}$	$C.\frac{9}{16}$	D. $\frac{15}{16}$	E. None of these		
27.	Find the probability that a two-digit number, chosen at random, is a multiple of 4 given that it is also a multiple of 6.					
A. $\frac{8}{15}$	B. $\frac{9}{13}$	C. $\frac{7}{14}$	$D.\frac{6}{13}$	E. None of these		
28.	28. There are 200 balls (numbered 1 to 200) in a box. Find the probability of choosing a ball which bears either perfect cube or perfect square and the unit digit is either multiple of 3 or multiple of 2?					
A. $\frac{11}{200}$	$\frac{1}{0}$ - B. $\frac{3}{50}$ - C	$C.\frac{17}{200}$	D. $\frac{13}{200}$	E. None of these		
29.	A bag contains 'x' red, ' $2x - 1$ ' blue and ' $3x - 2$ ' green balls. Two balls are randomly drawn from the bag and the probability that a blue ball and a green ball are drawn is 1/3. Find the total number of balls in the bag.					
A. 27	B. 33	C. 39	D. 45	E. Can't be determined		
30.	30. A bag contains certain number of green and pink balls. The ratio of the number of green and pink balls in the bag is 2: 3 respectively. Two balls are randomly drawn from the bag and the probability that both the balls are pink is 6/17. Find the total number of balls in the bag.					
A. 30	B. 40	C. 35	D. 55	E. None of these		
31.	In a class of 25 students cor the three class representati		s, what is the prob	ability that exactly one of		
A. $\frac{19}{43}$	В. <mark>20</mark> 41	C. $\frac{23}{46}$	D. $\frac{21}{46}$	E. None of these		

32. If two dices are rolled, what is the probability that a number greater than 3 comes on at least one dice? C. $\frac{3}{4}$ D. $\frac{7}{12}$ A. $\frac{1}{4}$ B. $\frac{1}{2}$ E. None of these In a bag there are 4 green,"x" red and "x+2" blue pens. If two pens are drawn at 33. random one after the other, the probability that first pen is blue and second pen is red is 5/44. What is the value of x? A. 6 B. 5 E. None of these C. 3 D. 7 If the letters of the word "CONJUNCTION" are arranged in a circle what is the 34. probability that no two vowels are together? A. $\frac{7}{66}$ C. $\frac{14}{33}$ B. $\frac{7}{22}$ D. $\frac{16}{77}$ E. None of these 35. A courier service guy has to deliver a parcel to a particular flat in an apartment. There are five floors in the apartment and a ground floor. There are twelve flats on each floor and ground floor is for parking. The flats are numbered according to the floor, the flats on the first floor are numbered 101,102112, similarly on the second floor, flats are numbered as 201,202......212, and this is repeated on each floor. The courier guy forgot the number of the flat but remembers that it was not on second or third floor and digit "1" was there exactly once in the flat number. What is the probability that he delivered the courier in the correct flat? A. $\frac{1}{16}$ D. $\frac{1}{22}$ B. $\frac{1}{24}$ C. $\frac{1}{14}$ E. None of these There are two round tables with seven and five chairs. What is the probability of 36. seating twelve people on these tables such that two particular persons don't sit on the same table? A. $\frac{1}{66}$ B. $\frac{35}{132}$ C. $\frac{35}{66}$ D. $\frac{25}{66}$ E. None of these 37. There is a dart board with five concentric circles of radius 4cm, 6cm, 10cm, 14cm and 24cm. What is the probability that a dart thrown will hit the board between smallest and second largest circle? A. $\frac{9}{19}$ B. $\frac{49}{144}$ C. $\frac{83}{144}$ D. $\frac{5}{16}$ E. None of these

38. If three hunters A, B and C can hit targets with probabilities 0.5, 0.4 and 0.1 respectively, what is the probability that hunter C kills a deer after both A and B have fired at it once, assuming that it only takes a hunter one shot to kill the deer? (A hunter hits or misses independent of what the other hunters have done.) A. 0.03 B. 0.01 C. 0.1 D. 0.02 E. None of these 39. A bag contains 7 red, 5 green and 6 blue balls. Three balls are drawn one by one at random without replacement. Find the probability that the first ball is red, second ball is green and third ball is blue? A. $\frac{31}{512}$ D. $\frac{34}{812}$ B. $\frac{35}{816}$ C. $\frac{33}{713}$ E. None of these **40**. Two dice are thrown simultaneously. Find the probability that sum of the numbers on both the dice is a prime number. A. $\frac{1}{4}$ B. $\frac{5}{12}$ C. $\frac{7}{12}$ D. $\frac{11}{12}$ E. None of these A man and his wife appear in an interview. The probability of husband's selection is 41. 1/7 and the probability of wife's selection is 1/5. What is the probability that only one of them is selected? C. $\frac{1}{3}$ be Oue $\frac{D}{35}$ be Rep $E.\frac{1}{49}$ A. $\frac{2}{7}$ B. $\frac{1}{25}$ 42. A bag contains 2 red, 5 green and 4 yellow balls. 4 balls are drawn at random, find the probability that out of four balls at least 3 balls are yellow. A. $\frac{19}{330}$ D. $\frac{8}{165}$ C. $\frac{29}{330}$ B. $\frac{4}{165}$ E. None of these There are 6 Green, 5 Red and 3 white balls in a bag. If 3 balls are drawn randomly 43. what is the probability that no ball is Red? D. $\frac{5}{14}$ A. $\frac{6}{13}$ C. $\frac{3}{12}$ B. $\frac{9}{17}$ E. None of these 44. A bag contains 5 green, 7 yellow and 4 red balls. Three balls are drawn at random, find the probability that all the balls are of same colour. A. $\frac{5}{46}$ C. $\frac{7}{79}$ $D.\frac{7}{90}$ B. $\frac{9}{70}$ E. None of these

45. A bag contains 'x' red, 'x + 3' blue and '2x - 2' green balls. Two balls are randomly drawn from the bag and the probability that both the balls are green is 3/20. Find the total number of balls in the bag. A. 27 B. 25 C. 23 D. 21 E. 20 **46**. In a class of 80 students, a student is to be selected for becoming monitor. If 20 % of total students belongs to ST category, 15 % belongs to SC category, 30 % belongs to OBC category and remaining belongs to General category and in each category the ratio of boys and girls is 1: 1. What is the probability that the monitor selected is a girl who belongs to either ST or **OBC category** ? A. $\frac{3}{5}$ B. $\frac{1}{4}$ C. $\frac{3}{4}$ D. $\frac{3}{8}$ E. None of these 47. A packet contains some red pens, blue pens and black pens such that the probability of picking a red pen is 3/13 and probability of picking a black pen is 1/3. If no. of blue pens is 17 and if all the pens are numbered starting from 1,2,3,.... and so on , then what is the probability of getting one pen numbered as multiple of 5 or 8? B. $\frac{3}{52}$ C. $\frac{3}{13}$ D. $\frac{11}{39}$ A. $\frac{2}{3}$ E. $\frac{10}{39}$ A box contains 50 marbles of different colours i.e. purple, pink and blue. Find the **48**. number of pink marbles in the box, if probability of picking up a purple marble is 3/5 and that of either a purple or a pink marble is 4/5. A. 6 B. 8 C. 5 D. 10 E. None of these **49**. 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 in colour? B. $\frac{4}{21}$ C. $\frac{5}{21}$ D. $\frac{2}{23}$ A. $\frac{3}{11}$ E. None of these **50**. A bag contains 'x' red, 'x+5' blue and 'x + 7' grey balls. If two balls are randomly drawn from the bag and the probability that both the balls are of same colour is 148/435, then find the total number of balls in the bag. A. 36 balls B. 64 balls C. 58 balls D. 30 balls E. 29 balls

CORRECT ANSWERS:

1	С	11	С	21	С	31	D	41	А
2	А	12	С	22	В	32	С	42	С
3	D	13	E	23	С	33	С	43	С
4	В	14	С	24	С	34	Α	44	D
5	D	15	В	25	D	35	С	45	В
6	В	16	А	26	В	36	С	46	В
7	В	17	С	27	А	37	D	47	D
8	С	18	А	28	А	38	Α	48	D
9	D	19	А	29	E	39	В	49	E
10	В	20	С	30	С	40	В	50	D



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Explanations:

1. The total number of students = 18

When 1 name was selected from 18 names, the probability that he was of section B = $\frac{6}{18} = \frac{1}{3}$

But from the question, there are 6 students from the section B and the age of all 6 are different therefore, the probability of selecting one i.e. youngest student from 6 students will be 1/6

Hence, option C is correct.

2. Let, the number of pink balls be p Probability of choosing a pink ball = $\frac{p}{35}$

 $=>\frac{3}{7}=\frac{p}{35}$

=> p = 15 So, remaining number of balls = (35 – 15) = 20

Number of orange balls = $\frac{2}{2+3} \times 20 = 2 \times 4 = 8^2$ Question Bank

Therefore, reqd. probability = $\frac{{}^{8}C_{1} \times {}^{15}C_{1}}{{}^{35}C_{2}}$

 $=\frac{8 \times 15}{35 \times 34/2} = \frac{24}{119}$

Hence, option A is correct.

3. Number of ways in which the person can pick three balls out of 18 balls = ${}^{18}C_3 = 816$ Number of ways of picking 3 balls of same colour = ${}^{6}C_3 + {}^{4}C + {}^{8}C_3 = (20 + 4 + 56) = 80$

Probability of picking three balls of same color = $\frac{80}{816} = \frac{5}{51}$

Required probability = 1 – probability of picking three balls of same colour = $1 - \frac{5}{51} = \frac{46}{51}$ Hence, option D is correct.

4. Total boxes = 16

Total pieces = 16

Similar pieces = 8 pawns, 2 bishops, 2 rooks, 2 knights

Total ways of arranging these 16 pieces in 16 boxes

 $=\frac{16!}{(8!\ 2!\ 2!\ 2!)}=\frac{16!}{(8\times8!)}$

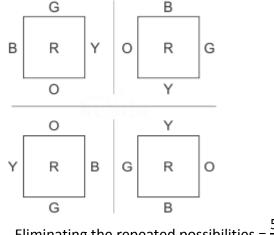
Ways of correct arrangement = 1

Probability of correct arrangement = $\frac{1}{(16! / (8 \times 8!))}$

 $=\frac{(8\times8!)}{16!}=\frac{8!}{(2\times15!)}$

Hence, option B is correct..

5. We fix the red face and to its left pink face and bottom face as blue The number of ways to arrange the other three colors = 3! Total ways of painting the six colors First we fix any one color on any one face, let's say red color. The number of ways five color can be painted = 5!



Eliminating the repeated possibilities = $\frac{5!}{4}$ = 5 × 3!

We divide by four to eliminate the repeated possibilities as shown in the figure below. These possibilities are counted as different but don't give us a different arrangement. The arrangement in all four is same.

Probability (Red, pink and blue share a common corner) = $\frac{3!}{5 \times 3!} = \frac{1}{5}$

Hence, option D is correct.

6. Let the names of children be x, y and z. The probabilities of the three children to finish the race are 1/3, 1/5 and 1/4 respectively. It may be noted that one reaching the finishing point is independent of other reaching. If P(x), P(y) and P(z) denotes the probabilities.

The probability of at least one of them reaching the finishing point = 1 - P (none of them finishing the race)

$$= 1 - \left(\frac{2}{3}\right) \left(\frac{4}{5}\right) \left(\frac{3}{4}\right) = \frac{3}{5}$$

Hence, option B is correct.

7. Let the tiffin boxes be T1 and T2. T1 contains x pink and x-4 yellow toffees; T2 contains x-3 pink and x-1 yellow toffees. The possibility is that either of T1 or T2 is selected with a probability of 1/2 in each case. Having selected a tiffin, two different toffees are selected. The probability is 67/132.

$$\frac{[x(x-4)/^{2x-4}C_2]}{2} + \frac{[(x-1)(x-3)/^{2x-4}C_2]}{2} = \frac{67}{132}$$

$$\frac{\{(2x^2 - 8x + 3)/^{2x-4}C_2\}}{2} = \frac{67}{132}$$

$$\frac{(2x^2 - 8x + 3)}{2x - 4C_2} = \frac{134}{132}$$

$$\frac{(2x^2 - 8x + 3)}{2x - 4C_2} = \frac{67}{66}$$
.....(i)

Total number of toffees in first tiffin = x + x - 4 = 2x - 4Now putting the value of total number of toffees i.e.; 2x - 4 in (1)using options From option (a) 2x - 4 = 8 x = 6put value of x in (1) L.H.S = $\frac{\{2(36) - 8(6) + 3\}}{^{8}C_{2}} = \frac{27}{28}$ L.H.S \neq R.H.S From option (b) 2x - 4 = 12 x = 8put value of x in (1) L.H.S = $\frac{67}{66}$ L.H.S = R.H.S Hence, option B is correct. 8. Pages = 1 cover page, 12 theory pages, 6 pictures page

Except cover page

Ways of arranging 12 + 6 pages = 18!

Ways of arranging so that the theory pages are in order and drawing pages come together= ${}^{13}C_1 \times 6!$

(As there are 13 gaps between 12 pages where 6 pages can be kept)

Probability = $\frac{{}^{13}C_1 \times 6!}{18!} = \frac{13 \times 40}{17!}$

Hence, option C is correct.

9. Total characters = 9, vowels = 2, consonants = 7

7 positions

Except the end places, vowels can be arranged at 7 places No of ways = ${}^{7}C_{2} - 6$ (minus 6 for the chances when both vowels are together) = 15 No of ways of arranging the 7 consonants = $\frac{7!}{3! \times 2!}$

Letters are K - 3, A - 2, C - 2, R, and J

No of arrangement with restriction = $\frac{15 \times !}{3! \times 2!}$

Total no of arrangements = $\frac{9!}{3! \times 2! \times 2!}$

Probability = $\frac{(15 \times 7!/3! \times 2!)}{(9!/3! \times 2! \times 2!)} = \frac{5}{12}$

Hence, option D is correct.



10. Total number of ways to select team blue without any restriction = ${}^{9}C_{5}$ Similarly team Red can be selected in ${}^{9}C_{5}$ ways

Total number of ways to select both the teams = ${}^{9}C_{5} \times {}^{9}C_{5}$ P (at least one of them plays) = 1 – P (none of them plays)

Total number of ways of selecting team without selecting ankit and vaibhav = ${}^{8}C_{5} \times {}^{8}C_{5}$

P (at least one of them plays)= $1 - \frac{({}^{8}C_{5} \times 8C_{5})}{({}^{9}C_{5} \times {}^{9}C_{5})} = \frac{65}{81}$

Hence, option B is correct.

11. Product of all three digits will be even if at least one of the digits is even. So we can calculate and eliminate the no of chances when all the digits are odd and all other combinations will have at least one even number to make the product even.

P (product will be even) = 1 - P (product will be odd)

Probability to get odd on one dice = $\frac{3}{6} = \frac{1}{2}$

Probability of getting odd number on all three dices = $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$

Probability (product will be odd) = 1/8 The Question Bank

So, Probability (product will be even) = $1 - \frac{1}{8} = \frac{7}{8}$

Hence, option C is correct.

12.

Probability of choosing one bag = $\frac{1}{2}$

Probability of Whitestone from 1st bag = $\frac{1}{2} \times \frac{{}^4C_1}{{}^{12}C_1} = \frac{4}{24} = \frac{1}{6}$

Probability of Whitestones from 2nd bag = $\frac{1}{2} \times \frac{{}^{5}C_{1}}{{}^{10}C_{1}} = \frac{5}{20} = \frac{1}{4}$

 $\therefore \text{ Reqd. probability} = \frac{1}{6} + \frac{1}{4} = \frac{5}{12}$ Hence, option C is correct. 13. Probability of getting a white ball in 2 trails

 $= \left\{ P\left(W\right) \right\}^{2} = \frac{1}{81}$ $\left\{ P\left(W\right) \right\} = \frac{1}{9}; \therefore \text{ Number of white ball} = 1$

Similarly ,probability of getting yellow ball in two trails

 $= \left\{ P\left(Y\right) \right\}^{2} = \frac{4}{9}$ $\left\{ P\left(Y\right) \right\} = \frac{2}{3}; \therefore \text{ Number of yellow ball} = 6$

Number of Black balls = 9 - (6 + 1) = 2

$$P(B) = \frac{2}{9}; P(W) = \frac{1}{9}; P(Y) = \frac{6}{9}$$

There are six different ways of getting 3 different balls of 3 different colour. They are (B, Y, W) , (Y, B, W) , (Y, W, B) , (W, Y, B), (B, W, Y) , (W, B, Y)

Probability of each six $=\frac{2}{9} \times \frac{1}{9} \times \frac{6}{9} = \frac{4}{243}$

Reqd. probability = $\frac{4}{243} \times 6 = \frac{8}{81}$

Hence, option E is correct.



14. Honours card – Ace, King, Queen and jack.

Spots card – Numbered card {2 to10}

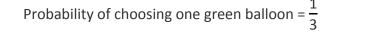
Total honor cards = 16

Number of ways of drawing 2 honor cards = ${}^{16}C_2$.

Reqd. probability =
$$\frac{{}^{16}C_2}{{}^{52}C_2} = \frac{20}{221}$$

Hence, option C is correct.

15.





Hence, option B is correct.

16. The minimum sum that can be obtained when two dice are thrown simultaneously is 2. Since we are interested in sum being less than or equal to 4, we are looking for the number of occurrences where sum is 2, 3 or 4. The possibilities are

Sum of 2 : (1, 1)

Sum of 3 : (1, 2) (2, 1)

Sum of 4 : (1, 3) (2, 2) (3, 1)

i.e., a total of 6 occurrences.

Hence, the reqd. probability is $\frac{6}{36} = \frac{1}{6}$

Hence, option A is correct.

Probability of dice showing red = $\frac{1}{2}$

17.

Amit loses the game if he gets a red in 1^{st} , 3^{rd} , 5^{th} or 7^{th} trail

Probability of Amit loses to Anit = $\frac{1}{2} + \left(\frac{1}{2}\right)^3 + \left(\frac{1}{2}\right)^5 + \dots + \left(\frac{1}{2}\right)^{2n+1}$

Sum of infinite terms of Geometric progression = $S_{\infty} = \frac{A}{1-r}$

- $=\frac{1}{2}+\left[\frac{1}{2}+\left(\frac{1}{2}\right)^{2}+\left(\frac{1}{2}\right)^{4}+....+\right]$
- $\Rightarrow \frac{1}{2} \left[\frac{1}{1 \frac{1}{4}} \right] = \frac{2}{3}$

Probability of Amit losing the match = $\frac{2}{3}$

Therefore, probability of Anit loosing = $1 - \frac{2}{3} = \frac{1}{2}$ The Question Bank Hence, option C is correct.

18. Probability = x, 4x, 9x, 16x, 25x, 36x, 49x and 64x Addition should be equal to 1 204x = 1

$$x = \frac{1}{204}$$

Probability of getting 2 = $\frac{4}{204}$

Probability of getting 4 = $\frac{16}{204}$

Probability of getting $6 = \frac{36}{204}$

Favourable Probability = $\frac{4}{204} \times \frac{16}{204} \times \frac{36}{204} = \frac{4}{14739}$ Hence, option A is correct.

19. Let the number of Black, White and Pink balls are 6X,9X and 20X respectively. Total Number of Balls = 35X Probability of Getting two pink Balls = $\frac{20XC2}{35XC2} = \frac{52}{161}$ $\Rightarrow \frac{20X \times (20X - 1)}{35X \times (35X - 1)} = \frac{52}{161}$ \Rightarrow 161 (80X - 4) = 52 (245X - 7) \Rightarrow 12880X - 644 = 12740X - 364 ⇒ 140X = 280 \Rightarrow X = 2 Number of Black Balls = 6X = 12 Hence, option A is correct. 20. Total number of players = 12 + 15 + 8 + 5 = 40The probability of selecting one class2 player = $\frac{15}{40}$ The probability of selecting one class 3 player = $\frac{8}{40}$ Direction Bank The reqd. probability $=\frac{15}{40} + \frac{8}{40} = \frac{23}{40}$ Hence, option C is correct. 21. The number of red cards = 26 The number of ways of selection 3 red cards out of 26 cards = ${}^{26}C_3$ $=\frac{24 \times 25 \times 26}{6} = 4 \times 25 \times 26$ The number of ways of selection 3 cards out of 52 cards = ${}^{52}C_{3}$ $=\frac{50 \times 51 \times 52}{6}=50 \times 8.5 \times 52$ The reqd. probability = $\frac{4 \times 25 \times 26}{50 \times 8.5 \times 52} = \frac{2}{17}$ Hence, option C is correct.

22. Let us assume all girls as one student because all the girls are sitting together then the total number of students = 5 + 1 = 6 students

Now, we can arrange 6 students in 6! Ways

And, originally the total number of students = 5 + x students (where x = total number of girls)

We can arrange then in (5 + x)! ways

And, we can arrange x girls in x! ways

The reqd. probability = $\frac{1}{42} = \frac{6! \times x!}{(5+x)!}$

 $42 \times 720 \times x! = (x + 5)! = (x + 5) \times (x + 4) \times (x + 3) \times (x + 2) \times (x + 1) \times x!$

 $42 \times 720 = 7 \times 6 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = (x + 5) \times (x + 4) \times (x + 3) \times (x + 2) \times (x + 1)$

Now check with the option instead of solving the equation

Only x = 5 satisfy the given condition Smartkeeda

Hence, option B is correct.

The number of ways to select 1 out of 3 + x students = 3 + x ways 23.

The number of ways to select 1 girl out of x girls = x ways

The required probability = $\frac{x}{3+x} = \frac{4}{7}$

x = 4

The number of ways of ways to select 1 out of 3 boys = ${}^{3}C_{1} = 3$

The number of ways to select 2 out of 4 girls = ${}^{4}C_{2}$ = 6 ways

The number of ways to select 3 out of 7 students = ${}^{7}C_{3}$ = 35 ways

The reqd. probability = $\frac{6 \times 3}{35} = \frac{18}{35}$

Hence, option C is correct.

24. Let the total number of venomous snakes = x The probability to catch one venomous snake $=\frac{x}{153}=\frac{2}{17}$ By solving, x = 18The number of non – venomous snakes = 153 – 18 = 135 Hence, option C is correct. 25. Ram's probability of getting selected = $25\% = \frac{1}{4}$ Sham probability of getting selected = $20\% = \frac{1}{r}$ The probability of Ram not getting selected = $1 - \frac{1}{4} = \frac{3}{4}$ The probability of Sham not getting selected = $1 - \frac{1}{5} = \frac{4}{5}$ The probability of both not getting selected = $\frac{3}{4} \times \frac{4}{5} = \frac{3}{5} = 60\%$ tion Bank Hence, option D is correct. P (getting at least 2 heads) = 1 - P (getting no head or exactly one head) 26. P (getting no head) = P (getting all tails) = $\frac{1}{16}$ Now, P(exactly one head) : Getting exactly one head means 3 tails and 1 head in any order and the total occurrences here are $=\frac{4!}{3!}=4$ Therefore, P(getting exactly one head) = $\frac{4}{16} = \frac{1}{4}$ Hence, P(getting at least 2 heads) = $1 - \left(\frac{1}{16} + \frac{1}{4}\right) = \frac{11}{16}$ Hence, option B is correct.

27. We can use this formula,

$$P(AIB) = \frac{(P(A \cap B))}{(P(B))}$$

Number of two-digit numbers = 90 (from 10 to 99)

Let A be the event that a two-digit number is divisible by 4 and B be the event that a two-digit number is divisible by 6.

Then, $(A \cap B)$ denotes the event that the number is divisible by both 4 and 6, i.e it is divisible by L.C.M of 4 and 6 which is 12.

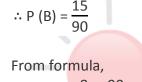
The two-digit numbers divisible by 12 are 12, 24, 36, 48, 60, 72, 84 and 96. Thus, there are total of 8 such numbers.

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The Question Bank

$$\therefore P(A \cap B) = \frac{8}{90}$$

And there are 15 such numbers which are divisible by 6 (6, 12.....96)



P (AIB) =
$$\frac{8}{90} \times \frac{90}{15}$$

P (AIB) =
$$\frac{8}{15}$$

Hence, option (A) is correct.

28. The balls which bears either perfect cube or perfect square = 1, 4, 8, 9, 16, 25, 27, 36, 49, 64, 81, 100, 121, 125, 144, 169, 196

The total number of balls in which the unit digit is either multiple of 3 or multiple of 2 = 4, 8, 9, 16, 36, 49, 64, 100, 144, 169, 196 = 11

So the required probability = $\frac{11}{200}$

Hence, option A is correct.

29. Total number of balls in the bag = x + 2x - 1 + 3x - 2 = 6x - 3

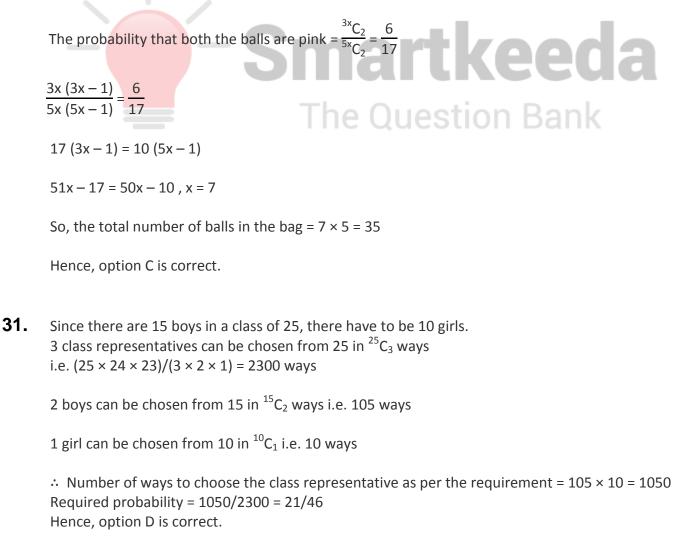
Probability that a blue ball and a green ball are drawn

$$=\frac{2x-1C_{1} \times 3x-2C_{1}}{6x-3} = \frac{1}{3}$$
$$\frac{2(2x-1)(3x-2)}{(6x-3)(6x-4)} = \frac{1}{3}$$
$$\frac{2(2x-1)(3x-2)}{3(2x-1)2(3x-2)} = \frac{1}{3}$$

Here, 'x' is eliminated, so the number of balls in the bag cannot be determined.

Hence, option E is correct.

30. Let the number of green and pink balls in the bag are 2x and 3x respectively



32. Method I:

The number of possibilities in which no dice shows a number greater than $3 = 3 \times 3$

Number of unfavorable outcomes = $3 \times 3 = 9$

Number of favorable outcomes = $6 \times 6 - 3 \times 3 = 27$

Probability $=\frac{27}{36}=\frac{3}{4}$

Hence, option C is correct.

Method II:

1st dice -1 2nd dice - 4/5/6 so 3 possibility

1st dice - 2 2nd dice - 4/5/6 so 3 possibility

1st dice -3 2nd dice -4/5/6 so 3 possibility

1st dice - 4 2nd dice - 1 to 6 so 6 possibility

1st dice -5 2nd dice - 1 to 6 so 6 possibility

1st dice - 6 2nd dice - 1 to 6 so 6 possibility

So total 27 possibilities out of 36. Hence 3/4 is the answer.

33. Probability of drawing first blue and then red

 $=>\frac{x+2}{2x+6}\times\frac{x}{2x+5}=\frac{5}{44}$

 $=> 24x^2 - 22x - 150 = 0$

Solving for x we get, x = 3

Hence, option C is correct.

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34. Word - CONJUNCTION

Total letters = 4 vowels (O - 2, I, U) and 7 consonants (C - 2, N - 3, J, T)

No of ways to arrange all the consonants = $\frac{7!}{2! \times 3!}$

Now there are 7 gaps in which four vowels are to filled

No of ways of filling and arranging 4 vowels in 7 gaps = $\frac{{}^{7}C_{4} \times 4!}{2!}$

Total number of ways of arranging the word = $\frac{7!}{2! \times 3!} \times \frac{{}^{7}C_{4} \times 4!}{2!}$

Total ways of arranging the word without any restriction = $\frac{11!}{2! \times 3! \times 2!}$



35. Total number of floors = 6

No of floors with flats = 5 (no flat on ground floor)

Total choice of flats = 5 - 2 = 3 (given that the courier is not for 2^{nd} or 3^{rd} floor)

The number of the flat is a three digit number

	1 st digit – Floor	2 nd digit	3 rd digit	Total number of possibilities
Possibilities	1	0 only	2 – 9	$1 \times 1 \times 8$
Possibilities	4/5	0	1	2 × 1 × 1
	4/5	1	0 and 2	2 × 1 × 2

Total number of possibilities = $1 \times 1 \times 8 + 2 \times 1 \times 1 + 2 \times 1 \times 2 = 8 + 2 + 4 = 14$ There will be only one case that he delivered the courier to correct flat.

So, probability of delivering the courier at correct flat = $\frac{1}{14}$

Hence, option C is correct.

36. Table 1 – 7 chairs and Table 2 – 5 chairs

Let A and B are persons who don't want to sit on the same table. People remaining = 12 - 2 = 10A can be seated on any table in two ways and the B can be seated on the other table. So no of ways to divide A and B on the tables = 2

On table 1, 6 seats are empty, no of ways to select 6 people out of $10 = {}^{10}C_6$, remaining 4 people will sit on Table 2

No of ways to arrange 7 people on Table 1 = 6!No of ways to arrange 5 people on Table 2 = 4!Total number of arrangement = $2 \times {}^{10}C_6 \times 6! \times 4!$ Total arrangements without any restrictions = ${}^{12}C_7 \times 6! \times 4!$

Probability = $\frac{2 \times {}^{10}C_6 \times 6! \times 4!}{{}^{12}C_7 \times 6! \times 4!} = \frac{35}{66}$

Hence, option C is correct.





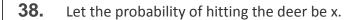
Ratio of radii of consecutive circles = 2 : 3 : 5 : 7 : 12 As area of a circle = πr^2 Ratio of area will be equal to square of radii Ratio of area of consecutive circles = 4 : 9 : 25 : 49 : 144 As the scoring region is between two circles, the ratio of area of consecutive regions will be in the ratio

of difference of their radii.

So, the ratio of area of the five areas = 4:9-4:25-9:49-25:144-49=4:5:16:24:95

Required Probability = area between first circle and fourth circle compared to the complete circle

 $=\frac{5+16+24}{144}=\frac{45}{144}=\frac{5}{16}$ Hence, option D is correct.



: The probability of missing it is 1 - x.

Hunter C can kill the deer only if both A and B have missed it.

 \therefore A misses with probability 0.5 and B misses with probability 0.6, and these two events are independent of each other.

 \therefore The probability of both missing the deer = (0.5) × (0.6)

But, the probability of C hitting the deer is 0.1

: The probability that C kills the deer after both A and B have missed it = $(0.5) \times (0.6) \times (0.1) = 0.03$

Hence, option A is correct.

39. Red = 7 Green = 5 Blue = 6 Total = 18 Reqd. probability = $\frac{7}{18} \times \frac{5}{17} \times \frac{6}{16} = \frac{35}{816}$

Hence, option (B) is correct.

40. Total number of outcomes = $6 \times 6 = 36$

Favourable outcomes = $\{(1,1), (1,2), (1,4), (1,6), (2,1), (2,3), (2,5), (3,2), (3,4), (4,1), (4,3), (5,2), (5,6), (6,1), (6,5)\}$

Total number of favourable outcomes = 15

Reqd. Probability = $\frac{15}{36} = \frac{5}{12}$

Hence, option (B) is correct.

.41.

Probability of man's selection is $\frac{1}{7}$

Probability of wife 's selection is $\frac{1}{5}$

Probability that any one of them is selected = probability of man's selection and not wife selection or probability of wife's selection not man

Then probability =
$$\frac{1}{7} \times \left(1 - \frac{1}{5}\right) + \left[\frac{1}{5} \times \left(1 - \frac{1}{7}\right)\right] = \frac{2}{7}$$

Hence, option A is correct.

42. Red = 2Green = 5 Yellow = 4





$$=\frac{29}{330}$$

Hence, option (C) is correct.

 $n(E) = {}^{9}C_{3}$ 43. $n(S) = {}^{14}C_3$

Possibility = $\frac{{}^{9}C_{3}}{{}^{14}C_{3}}$

$$=\frac{\frac{9\times8\times7}{3\times2\times1}}{\frac{14\times13\times12}{3\times2\times1}}=\frac{3}{13}$$

Hence, option C is correct.

Yellow = 7

Red = 4

Total = 16

Probability that all the balls are of same colour

$$=\frac{{}^{5}c_{3}+{}^{7}c_{3}+{}^{4}c_{3}}{{}^{16}c_{3}}=\frac{10+35+4}{560}$$

 $=\frac{49}{560}=\frac{7}{80}$

Hence, option (D) is correct.

45. The probability that both the balls are green

$$=\frac{2x-2C_{2}}{4x+1C_{2}} = \frac{3}{20}$$
So, $\frac{(2x-2)(2x-3)}{(4x+1)4x} = \frac{3}{20} = \frac{4x^{2}-10x+6}{4x^{2}+x} = \frac{3}{5}$
e Question Bank

$$= 12x^{2} + 3x = 20x^{2} - 50x + 30$$

$$= 8x^{2} - 53x + 30 = 0$$

$$= 8x^{2} - 48x - 5x + 30 = 0$$

$$= 8x (x-6) - 5 (x-6) = 0$$

$$= (8x-5) (x-6) = 0$$

$$x = 6, -\frac{5}{8}$$

Number of balls can't be negative, so the value of x = 6

Total number of balls in the bag = 6 + 9 + 10 = 25

Hence, option B is correct.

46. Total no. of students in the class = 80

Category	% age	No. of student	No. of girls	No. of boys
ST	20	16	8	8
SC	15	12	6	6
OBC	30	24	12	12
General	35	28	14	14

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It is given that in each category no. of boys and no. of girls is 1:1

Reqd. probability = $\frac{12}{80} + \frac{8}{80} = \frac{20}{80} = \frac{1}{4}$

Hence, option B is correct.

47.

Given, P(Red) =
$$\frac{3}{13}$$
, P(Black) = $\frac{3}{13}$

And no. of blue pens = 17

As we know, P(Red) + P(Black) + P(Blue) = 1 $\frac{3}{13} + \frac{1}{3} + P(Blue) = 1$

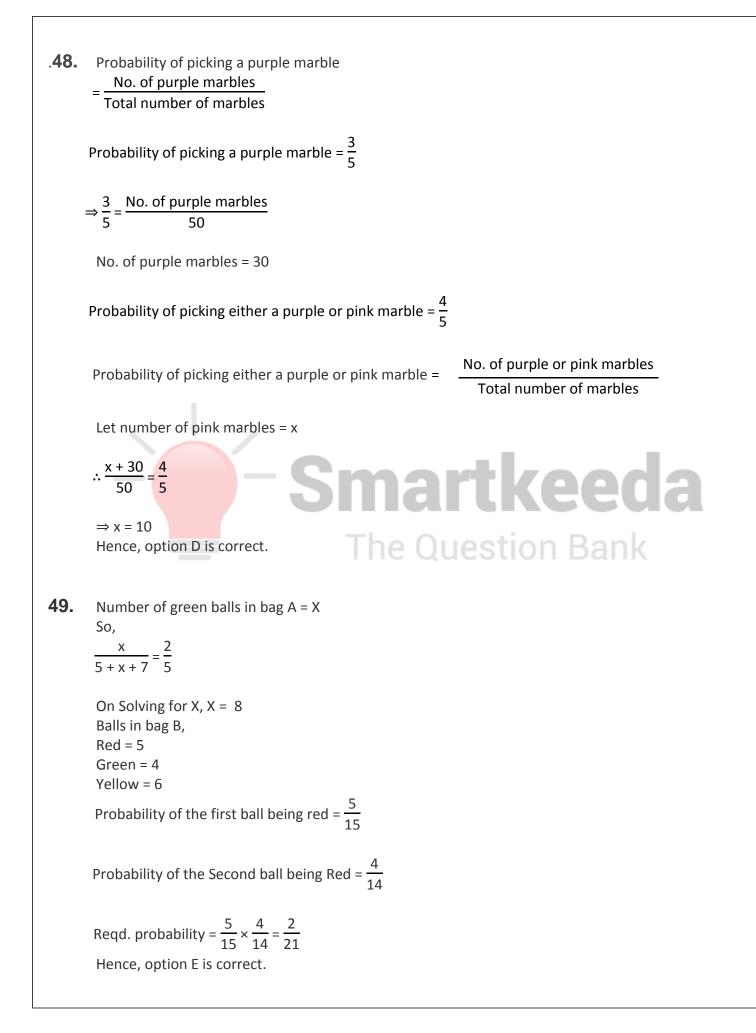
 $P(Blue) = 1 - \frac{22}{39} = \frac{17}{39}$

Let total no. of pens in the packet = x

Then, P(Blue) = $\frac{17}{x} = \frac{17}{39}$ x = 39 Also all the pens are numbered as 1,2,3....,39 Numbers that are multiple of 5 = 5, 10, 15, 20, 25, 30 and 35 And numbers that are multiple of 8 = 8, 16, 24 and 32 Favourable outcomes = 11

So, probability of getting pen of multiple 5 or 8 = $\frac{11}{39}$

Hence, option D is correct.



50 .	Number of red balls = x
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Number of blue balls = x + 5

Number of grey balls = x + 7

Total number of balls in the bag = 3x + 12

The probability that both the balls are of same colour

$$=\frac{{}^{x}C_{2} + {}^{x+5}C_{2} + {}^{x+7}C_{2}}{{}^{3x+12}C_{2}} = \frac{148}{435}$$
$$=\frac{[x(x-1) + (x+5)(x+4) + (x+7)(x+6)]}{(3x+12)(3x+11)} = \frac{148}{435}$$
$$=\frac{x^{2} - x + x^{2} + 9x + 20 + x^{2} + 13x + 42}{9x + 69x + 132} = \frac{148}{435}$$

 $=\frac{3x^2+21x+62}{9x^2+69x+132}=\frac{148}{435}$

= 1305x² + 9135x + 26970 = 1332x² + 10212x + 19536

The Question Bank

$$= 27x^{2} + 1077x - 7434 = 0$$

= 9x² + 359x - 2478 = 0
= 9x² + 413x - 54x - 2478 = 0
= x (9x + 413) - 6 (9x + 413) = 0
= (x - 6) (9x + 413) = 0

$$= x = 6, -\frac{413}{9}$$

Value of x can't be negative.

So, x = 6So, the total number of balls in the bag = 6 + 11 + 13 = 30 balls Hence, option D is correct.

