DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

**Solutions**

SUBJECT : MATHS
DPP No. : 7

# Topic :- PROBABILITY

3. $\left.\begin{matrix} np = 4 \\ npq = 2 \end{matrix}\right\} \Rightarrow q = \frac{1}{2}$ , $p = \frac{1}{2}$ , $n = 8$

$P(X = 2) = {}^{8}C_{2}\left(\frac{1}{2}\right)^{2}\left(\frac{1}{2}\right)^{6} = 28.\frac{1}{2^{8}} = \frac{28}{256}$

6. Let A be the event that sum of digits is 8
exhaustive cases $\rightarrow {}^{50}C_{1}$
favourable cases $\rightarrow$ 08, 17, 26, 35, 44 $= {}^{5}C_{1}$

$P(A) = \frac{{}^{5}C_{1}}{{}^{50}C_{1}}$

Let B be the event that product of digits is zero
favourable cases $\rightarrow$
{00, 01, ---, 09, 10, 20, 30, 40} $= {}^{14}C_{1}$

$\therefore \quad P(B) = \frac{{}^{14}C_{1}}{{}^{50}C_{1}}$

$\therefore \quad P(A/B) = \frac{P(A \cap B)}{P(B)} = \frac{1/{}^{50}C_{1}}{{}^{14}C_{1}/{}^{50}C_{1}} = \frac{1}{14}$

7. The probability of at least one success

$1 - \left(\frac{3}{4}\right)^{n} \geq \frac{9}{10}$

$\left(\frac{3}{4}\right)^{n} \leq \frac{1}{10}$

$n \geq \log_{3/4}\left(\frac{1}{10}\right)$

$n \geq \frac{-\log 10}{\log_{10} 3 - \log_{10} 4}$

$n \geq \frac{1}{\log_{10} 4 - \log_{10} 3}$

8. Required probability $= \frac{{}^{3}C_{1}}{{}^{9}C_{1}} \cdot \frac{{}^{4}C_{1}}{{}^{8}C_{1}} \cdot \frac{{}^{2}C_{1}}{{}^{7}C_{1}} \cdot 3! = \frac{2}{7}$

9. $P\left(\frac{C}{D}\right) = \frac{P(C \cap D)}{P(D)} = \frac{P(C)}{P(D)}$

$P(D) = \frac{P(C)}{P\left(\frac{C}{D}\right)} \leq 1$

$P(C) \leq P\left(\frac{C}{D}\right)$

$P\left(\frac{C}{D}\right) \geq P(C)$

10. at least one failure = 1 – all sucess

$1 \geq 1 - p^5 \geq \frac{31}{32}$

$0 \leq p^5 \leq \frac{1}{32}$

$0 \leq p \leq \frac{1}{2}$

$p \in \left[0, \frac{1}{2}\right]$

11. $P(A \cap B \cap C) = 0$

$P\left(\frac{\bar{A} \cap \bar{B}}{C}\right) = \frac{P\{(\bar{A} \cap \bar{B}) \cap C\}}{P(C)} = \frac{P(\bar{A} \cap \bar{B})P(C)}{P(C)}$

$= \frac{[1 - P(A) - P(B) + P(A)P(B)]P(C)}{P(C)}$

$(\because P(A \cap B \cap C) = 0)$

$= \frac{P(C) - P(A)P(C) - P(B)P(C)}{P(C)}$

$= 1 - P(A) - P(B) = P(A^C) - P(B)$

12. Let Events A denotes the getting min No. is 3 & B denotes the max. no. is 6

$P\left(\frac{A}{B}\right) = \frac{P(A \cap B)}{P(B)} = \frac{{}^2C_1}{{}^5C_2} = \frac{2}{10} = \frac{1}{5}$

Aliter

$P\left(\frac{A}{B}\right) = \frac{P(A \cap B)}{P(B)} = \frac{\frac{{}^4C_3 - (2)}{{}^8C_3}}{\frac{{}^6C_3 - {}^5C_3}{{}^8C_3}} = \frac{2}{10} = \frac{1}{5}$

13. P(4correct) + P(5 correct)

$= {}^5C_4\left(\frac{1}{3}\right)^4\left(\frac{2}{3}\right) + \left(\frac{1}{3}\right)^5 = \frac{11}{3^5}$

16. $P = {}^{14}C_{13}\ \frac{1}{2}\left(\frac{1}{2}\right)^{14-13} = 14 \times \frac{1}{2^{13}}\ \frac{1}{2} = \frac{7}{2^{13}}$

17. (B)

Since the two boys came out are a girl and a boy, therefore remaining 2 are boys iff among the 4 students 3 are boys and 1 is a girl

$\therefore$ probability $= {}^4C_3\left(\frac{1}{2}\right)^4 = \frac{1}{4}$

18. A ball from first urn can be drawn is two mannars

ball is white or ball is black

$P(w) = \frac{m}{m+n}$ $P(B) = \frac{n}{m+n}$

Let E $\rightarrow$ selecting a white ball from second urn after a ball from urn first has been placed into it

$P(E) = P(w)\ P(E/W) + P(B)\ P(E/B)$

$= \frac{m}{m+n} \times \frac{p+1}{p+q+1} + \frac{n}{m+n} \frac{p}{p+q+1}$

$= \frac{m(p+1)+np}{(m+n)(p+q+1)}$

19. (A)

Total number of functions from A to B = $n(S) = 5^7$

total number of onto functions from A to B is

$n(E) = \frac{7!}{3!4!} \times 5! + \frac{7!}{3!2!} \times \frac{1}{2!2!} \times 5! = \frac{7! \times 20}{6}$

$\therefore \quad P(E) = =$

20. Last place can be occupied by (0 – 9) 10 methods.

to get '6' at unit place of $x^4$ Last digit should be 2, 4 ,6 or 8 is 4 ways

$\Rightarrow \qquad P = \frac{4}{10} \equiv 40\%$

| ANSWER-KEY | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Q. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A. | A | A | D | B | C | C | C | B | D | A |
| | | | | | | | | | | |
| Q. | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| A. | A | C | C | C | C | A | B | B | A | D |
| | | | | | | | | | | |