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DMS INTERNEL - II

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Section - I

1A

The major difference between the permutation and combination are given below:

Permutation	combination.
- Permutation means the selection of objects where the order of selection matters.	- The combination means the selection of objects in which the order of selection does not matters.
- In other words, It is the arrangement of r objects taken out of n objects.	- In other words it is the selection of r objects taken out of n objects. the irrespective of object arrangement
- The formula for Permutation is $^nC_r = n!/(n-r)!$	- The formula for combination is $^nC_r = n!/[r!(n-r)!]$

4 A(i) Sol:

(a) No: of heart = 13;

No: of spade = 13;

Sum Rule = ways To Draw HEART (or) SHADE

= 13+13 = 26 ways.

(b) No: of heart = 13

No: of ACE = 4

SumRule : ways to DRAW HEart (or) AE

= 13+4 = 17 ways.

(c)

No: of ACE = 4

No: of King = 4.

SumRole : ways to DRAW HEART (OR) KING

= 4+4 = 8 ways

(d) No: of b/n 2 to 10 is 10

No: of way o card numbered 2 through

$10 = 9 \times 4 = 36$ ways.

(e) No: of numbered card $= 36$

No: of King $= 4$

$\therefore$ No: of ways to draw Numbered Card

(or) a King $= 36 + 4$

$= 40$ ways.

6 A

Binomial Theorem

A Binomial theorem discribes the algebraic expresion of Powers of a Binomial with two variables.

$$(x+y)^n = {}^nC_0 \cdot x^n y^0 + {}^nC_1 \cdot x^{n-1} \cdot y^1 + {}^nC_2 \cdot x^{n-2} \cdot y^2 + \cdots$$
$$+ \cdots {}^nC_{n-1} \cdot x^1 \cdot y^{n-1} + {}^nC_n \cdot x^0 \cdot y^n$$

It can be written as

$$\boxed{(x+y)^n = \sum_{r=0}^{\infty} {}^nC_r \cdot (x)^{n-r} \cdot y^r}$$

$$= (1+x)^n = {}^nC_0\, 1^n \cdot x^0 + {}^nC_1\, 1^{n-1} \cdot x^1 + {}^nC_2 \cdot 1^{n-2} \cdot x^2 + \cdots$$
$$+ {}^nC_3 \cdot 1^{n-3} \cdot x^3 + \cdots\cdots$$

$$= {}^nC_0 \cdot x^0 + {}^nC_1 \cdot x^1 + {}^nC_2 \cdot x^2 + {}^nC_3 \cdot x^3 + \cdots\cdots$$

$$= 1 \cdot x^0 + \frac{n!}{(n-1)!\,1!} \cdot x + \frac{n!}{(n-2)!\,2!} \cdot x^2 + \frac{n!}{(n-3)!\,3!} \cdot x^3 + \cdots$$

$$= 1 + \frac{n(\cancel{n-1})!}{(\cancel{n-1})!} \cdot x + \frac{n.(n-1)(\cancel{n-2})!}{(\cancel{n-2})!\, 2!} x^2$$

$$+ \frac{n(n-1)(n-2)(\cancel{n-3})}{(\cancel{n-3})!\, 3!} x^3$$

$$\boxed{(1+x)^n = 1 + nx + \frac{n(n-1)}{2!} \cdot x^2 + \frac{n(n-1)(n-2)}{3!} x^3 + \cdots}$$

8A. Among 50 Patients admitted to a hospital.

25 are diagnosed with Pneumonia.

30 with bronchitis

10 with both Pneumonia and bronchits

Let $U = \{$ Patients in the hospital $\} \Rightarrow |U| = 50$

$A = \{$ diagnosed with Pneumonia $\} = |A| = 25$

$B = \{$ bronchitis $\} = |B| = 30$

$A \cap B = \{$ both pneumonia and bronchitis $\} = |A \cap B| = 10$

TO FIND:

No: of Patients nether diggnused with penemonia $\Big\}\ |\overline{A \cup B}| = |U| - |A \cup B|$ — ①

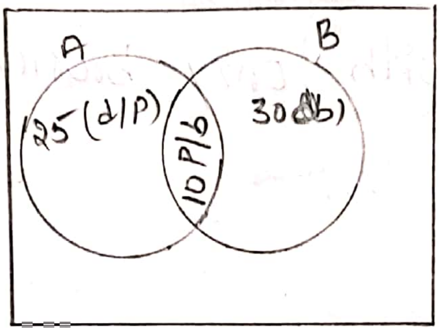
W.K.T

$|A \cup B| = |A| + |B| - |A \cap B| = 25 + 30 - 10 = 45$

$\therefore$ ① $\Rightarrow |\overline{A \cup B}| = 50 - 45$

$= 5$

$\therefore$ The 5 Patients neither of hospital.



(a) The number of Patients diagnosed with Pneumonia (or) bronchitis.

diagnosed pneumonia = 25.

(or)

diagnosed bronchitis = 30.

(b) The number of Patients

not dignosed pneumonia = 25

(or)

not dignosed bronchitis = 20.

(c) Number of Patients

diagnosed with only penumania = 20

(d) Number of Pataient
diagnosed with only bronchitic = 25.