DM - TT 2.

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SECTION - B

Q1 No of cricketers = 20
No of batsmen = 13
No of bowlers = 5
No of wicket-keepers = 2
No of players in final team = 11
Number of wicket-keepers to be taken = 1
Number of bowlers to be taken = minimum (3)
Rest all are batsmen.

CASE 1: 3 bowlers
Selection of bowlers = $^5C_3$
Selection of wicket keeper = $^2C_1$
Selection of rest players = $^{13}C_7$

Possible ways (ω_1) = $^5C_3 \times {}^2C_1 \times {}^{13}C_7 = 34320 \rightarrow (1)$

CASE 2: 4 bowlers
Selection of bowlers = $^5C_4$
Selection of wicket keeper = $^2C_1$
selection of rest players = $^{13}C_6$
∴ Possible ways (ω_2) = $^5C_4 \times {}^2C_1 \times {}^{13}C_6 = 17160 \rightarrow (2)$

CASE 3: 5 bowlers
selection of bowlers = $^5C_5$
Selection of wicket-keeper = $^2C_1$
Selection of rest players = $^{13}C_5$
∴ Possible ways (ω_3) = $^5C_5 \times {}^2C_1 \times {}^{13}C_5 = 2574 \rightarrow (3)$
∴ TOTAL WAYS = $\omega_1 + \omega_2 + \omega_3 = 34320 + 17160 + 2574$

= 54054

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Q2

ANS There are in all 10 persons of whom 4 are to be selected. This can be done in $^{10}C_4$ ways

$\therefore n = {}^{10}C_4$

(i) When one engineer of each branch is included :

This can be done in $^3C_1 \times {}^4C_1 \times {}^2C_1 \times {}^1C_1$ ways

$$P(A) = \frac{{}^3C_1 \times {}^2C_1 \times {}^2C_1 \times {}^1C_1}{{}^{10}C_4} = \boxed{\frac{4}{35}}$$

(ii) When atleast one Electronics Engineer is included :

Electronics Engineer	Other engineers	No of ways
1	3	$^3C_1 \times {}^7C_3 = 105$
2	2	$^3C_2 \times {}^7C_2 = 63$
3	1	$^3C_3 \times {}^7C_1 = 7$

$\therefore$ Required probability

$$P(B) = \frac{{}^3C_1 \times {}^7C_3 + {}^3C_3 \times {}^7C_2 + {}^3C_3 \times {}^7C_1}{{}^{10}C_4}$$

$$= \frac{175}{210}$$

$$= \boxed{\frac{5}{6}}$$