Que5:

An investigator interviewed 100 students to determine their preferences for the three drinks : milk (M), coffee (C) and tea (T). He reported the following : 10 students had all the three drinks M, C and T; 20 had M and C; 30 had C and T; 25 had M and T; 12 had M only; 5 had C only; and 8 had T only. Using a Venn diagram find how many did not take any of the three drinks.

Ans:

$n(U) = 100$, where U stands for universal set

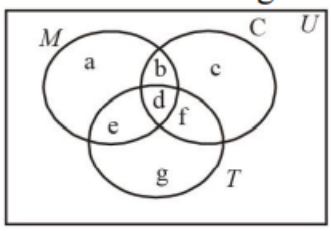
$n(M \cap C \cap T) = d = 10$; $n(M \cap C) = b + d = 20$;.

$n(C \cap T) = d + f = 30$; $n(M \cap T) = d + e = 25$;

$\Rightarrow b = 10, f = 20$ and $e = 15$

n (only M) $= a = 12$; n (only C) $= c = 5$; n (only T) $= g = 8$

Filling all the entries we obtain the Venn diagram as shown :



$\therefore \quad n(M \cap C \cup T) = a + b + c + d + e + f + g$

$= 12 + 10 + 5 + 15 + 10 + 20 + 8 = 80$

$\therefore \quad n(M \cup C \cup T)' = 100 - 80 = 20$