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I D : 242 FC242 H6

Lecture Group : TC1L

Total Marks :

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12

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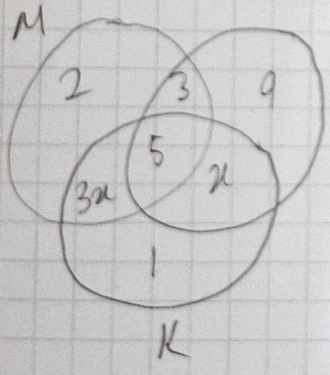
1) The Venn diagram shows the number of students in sets M, B, K. Given

M = { Studats who like CMT1134 subject }

B = { Studats who like CMT1142 subject }

K = { Studats who like CMT1114 subject }



If no. of studats who like CMT1134 (M) and CMT1114 (K) = 32,

i) Find value of x.

$M + K = 32$

$3x + 5 = 32$

$3x = 27$

$x = 9$ //

ii) Find the no. of studats who like 2 subjects only.

$3x + 3 + x$

$= 3(9) + 9 - 3$

$= 39$ //

2. There are 4 women and 5 men to be arranged in a row. Find the number of arrangements that can be ~~found~~ formed if

i) No restriction

4 women
5 men
} 9

$${}^9P_9 = 362880 \;//$$

ii) Both ends of the rows are men

M _ _ _ _ _ _ _ _ _ M

$${}^5P_1 \times {}^7P_7 \times {}^4P_1 = 100800 \;//$$

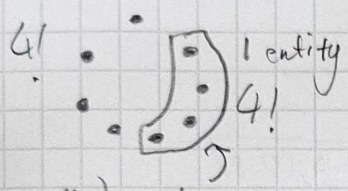
iii) Find the probability that both ends of the rows are men.

$$P(A) = \frac{n(A)}{n(S)}$$

$$= \frac{100800}{362880} = \frac{5}{18} \;//$$

3. Determine the number of ways of arranging 8 girls of in a circle where 4 girls are always next to each other.

[1 mark]



$\Rightarrow$ 5

$(8-4)+1 = 5$

$(n-1)!$

$= (5-1)!$

$= 4!$

n.o.w for 4 girls $= 4!$

$= 24$

n.o.w for 4 girls always next to each other $= 4!$

$= 24$

Total n.o.a $= 4! \times 4!$

$= 576$ //

4. Study shows that 15% of the population in a country wear Spectacles. Random sample of 20 ~~persons~~ people is selected.

$x \leq 2$

i) Find probability that (at most 2 persons) in this sample wear spectacles

$P(x \leq 2) = P(x=0) + P(x=1) + P(x=2)$

$n = 20$

$p = 15\% = 0.15$

$q = 1-p = 1-0.15 = 0.85$

$= {}^{20}C_0 (0.15)^0 (0.85)^{20} + {}^{20}C_1 (0.15)^1 (0.85)^{19} + {}^{20}C_2 (0.15)^2 (0.85)^{18}$

$= 0.038759831 08 + 0.136798345 + 0.229338401 9$

$= 0.404896278$

$\simeq 0.4049$ //

$\mu = np$

$\sigma^2 = npq$

ii) What is the mean and S.D of the number of persons who wear spectacles?

$\mu = np$

$= 20(0.15)$

$= 3$ //

$\sigma^2 = npq$

$\sigma = \sqrt{npq}$

$\sigma = \sqrt{(20)(0.15)(0.85}$

$= 1.5969$ //