





∴ We know maximum no of edges in its component of  $G$  is  $n_i(n_i-1)/2$

Therefore maximum number of edges in  $G$  is

$$= \frac{1}{2} \sum_{i=1}^k n_i(n_i-1)$$

$$\Rightarrow \frac{1}{2} \left[ \sum_{i=1}^k n_i^2 - \sum_{i=1}^k n_i \right]$$

$$\Rightarrow \frac{1}{2} \left[ \sum_{i=1}^k n_i^2 - n \right] \quad \leftarrow \text{from part}$$

By eq-(ii)

$$\Rightarrow \frac{1}{2} [n^2 + k^2 - 2nk - k + 2n - n]$$

$$\Rightarrow \frac{1}{2} [n^2 - nk - nk + k^2 - k + n]$$

$$\Rightarrow \frac{1}{2} [n(n-k) - k(n-k) + (n-k)]$$

$$\Rightarrow \frac{1}{2} (n-k) [n-k+1]$$