INTE-4. Soln Solr I) N distinct type of coupons. Probability of getting any coupon in equally likely.

Random variable T. = ANO. of coupons needed to be collected until one obtains complete set of atlestatione of each type.

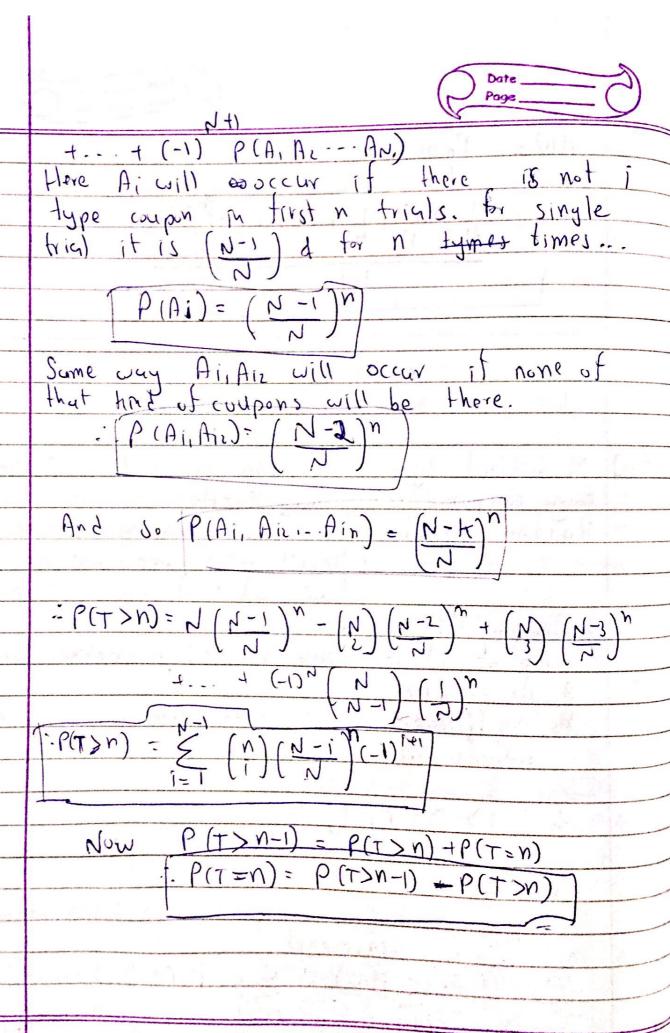
Derive P{T=n} First of all let's find P(T>n) An define some events

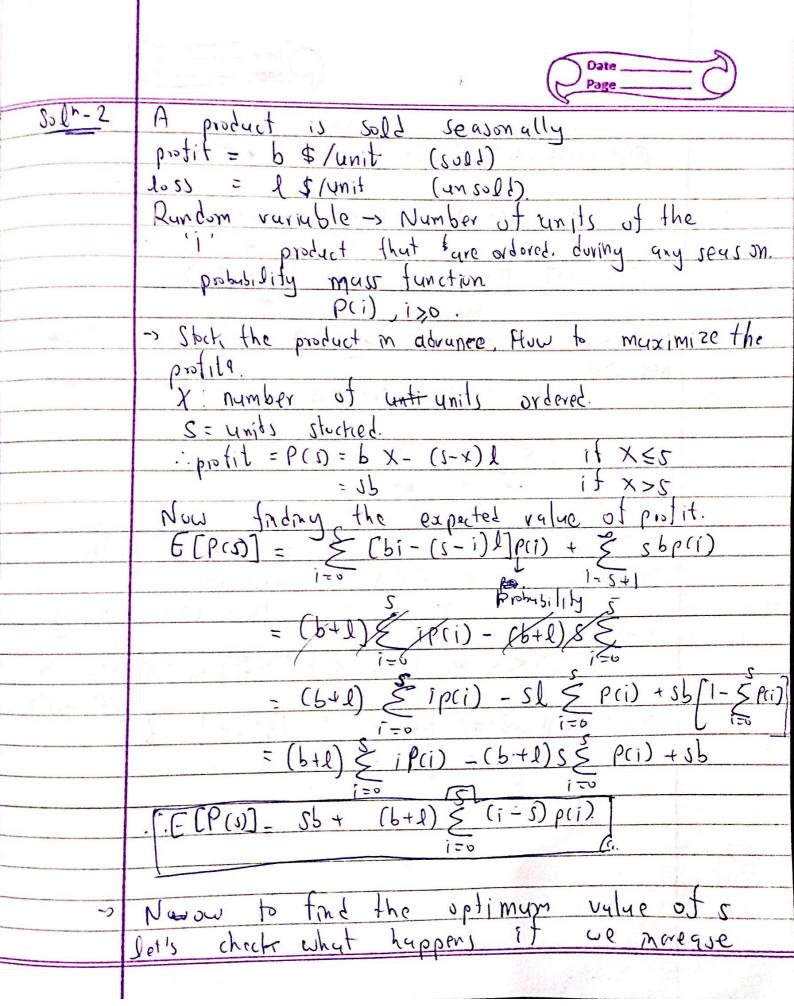
A, Az, ---, AN

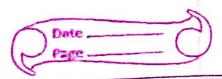
Ai No (1) coupun is collected among first n

coupons are collected. $P(T>n) = P(\bigcup_{i=1}^{N} A_i)$ (Now using the inclusion exclusion argument).

= \(\rho(Ai, \lambda \) + ... + (-1) \(\tau \) \(\frac{\frac}\frac{\frac{\f{







it with \pm . $E(C(s+1)) = b(s+1) + (b+1) \leq (i-s+-1) P(i)$ $= b(s+1) + (b+1) \leq (i-s-1) P(i)$:: E[P(sH)] - E[P(s)] = 5- (6+1) & P(i) ve will increase s by st1 if above term p = 100 > 0 5 = 6 + 100 > 0 5 = 6 + 100 > 0 5 = 6 + 100 > 0 5 = 6 + 100 > 0In above en LH.S. is mcreasing with mcrease of S & R.H.S. is constant. ... S* = largest value of S that can satisfy : E[P(0)] < E[P(1)] < ... < E[P(3)] < E[P(5)] > EP(Stz)]>... => We will text mireyse it to 15*+1 maximise the profit.

