1. A restaurant’s menu consists of 8 beverages, 11 appetizers, 6 salads, 24 entrees, 9 desserts, and 12 aperitifs. How many distinct dinners can they serve if each dinner contains:

(a) a beverage, an appetizer, a salad, an entree, a dessert, and an aperitif?

(b) a beverage, either an appetizer or a salad, an entree, and either a dessert or an aperitif?

2. How many ways can I arrange 6 Comedy video tapes, 7 Action tapes, 8 Drama tapes, 9 Horror tapes, and 10 Foreign tapes on a shelf if:

(a) I want all the Action tapes first, followed by the Comedy tapes, then the Drama tapes, then the Foreign tapes, and finally, the Horror tapes last?

(b) I only want all the tapes of the same type to be grouped together?

3. How many permutations are there of the words: (a) COMPUTER

(b) CALCULATOR

4. (a) How many CRAY words are there? (A CRAY word contains eight 8-bit bytes)

(b) How many CRAY words contain no repeated bytes?

5. How many integer solutions are there to:  \(A + B + C + D + E + F = 60\)

(a) with \(A, B, C, D, E, F \geq 0\)?

(b) with \(A \geq 2\) \(B \geq 1\) \(C \geq 5\) \(D \geq 0\) \(E \geq 4\) and \(F \geq 7\)?

6. Show that \(\binom{n}{k} + \binom{n}{k+1} = \binom{n+1}{k+1}\)

7. Use the Iteration Method to solve the Recurrence Relation, \(s_{n+1} = 7s_n - 2\) with \(s_0 = 1\).

8. (a) How many initial conditions are needed to find the particular solution of the recurrence relation, \(s_n = 3s_{n-1} - 5s_{n-2} + 8s_{n-4} + s_{n-5} + 28s_{n-6} - 5s_{n-18}\) ?

(b) Find the general solution of: \(s_n = 45s_{n-2} - 4s_{n-1}\).

(c) Find the particular solution of the recurrence relation whose general solution is:

\(s_n = D(7)^n + E(9)^n\), when \(s_0 = -1\) and \(s_1 = -15\) ?