Show all work neatly.

**Question 1:** (5) Find the optimal alignment using dynamic programming (by hand) of ATGCC and TACGCA. Use the Needleman-Wunsch cost function that you will use for the project, namely: \( c_{\text{indep}} = 5; c_{\text{sub}} = 1; \) and \( c_{\text{match}} = -3. \)

- Show your DP table.
- Circle the optimal alignment cost.
- Extract the optimal alignment(s) from the table (keep back-pointers in the table if you want).

**Question 2:** (5) Knapsack.
Use dynamic programming to fill a knapsack without repetition having a weight capacity of 10 units with a load of maximum value from the following set of objects:

- Weights: 1, 2, 5, 6, and 7 units
- Values: 1, 7, 11, 21, and 31, respectively.

Your answer should include:

- a table with solutions to sub-problems
- the value of the optimal load
- the objects to be included in the optimal load (keep back-pointers in the table if you want)