Questions:

Appendix B: B.5; B.10.
Chapter 2: 2.1(a, b, c, d); 2.2; 2.8; 2.9
Appendix C: C1(a, b, c, d)
Chapter 3: 3.1; 3.2; 3.7; 3.8; 3.9; 3.17

<<< Important Notes: (10/8) >>>

1. Questions 3.8, 3.9 involve Superscalar related questions which we have not covered. Therefore, these 2 questions are optional and will not count towards the total 100 points. If you solve the questions correctly, you will award 2 extra points for each question.

2. Questions 3.2: You need to insert “stall” into the code sequence on the left-hand side in Figure 3.48 using the latency cycles shown on the right-hand side of the figure.

3. Question 3.17: You need to simulate the branch prediction for a sequence of 9 branches as shown in the 3\textsuperscript{rd} table using both a correlated (1,2) predictor (in the 1\textsuperscript{st} table) and a (1,2) local predictor (in the 2\textsuperscript{nd} table). Both prediction methods have the same history table size. The correlated predictor records 4 branches (use the last two bits from the branch PC) and use the 1 bit correlation to decide the prediction from either T or NT (as marked “last outcome”). For local predictor, you can only record TWO branches (using the last bit in PC to decide). For each recorded branches, the 2-bit predictor records the prediction outcome based on the last two outcomes of each branch: T-T, NT-T, T-NT, and NT-NT. (NOTE, in Entry 3 of the local prediction table, the “last 2 outcomes” should be: “NT,NT”, not just NT.) Note also, the “Prediction” column is actually a 2-bit predictor. Its function (state transition) is shown in Figure C.18.