رقم الشعبة: رقم التسجيل: الاسم:

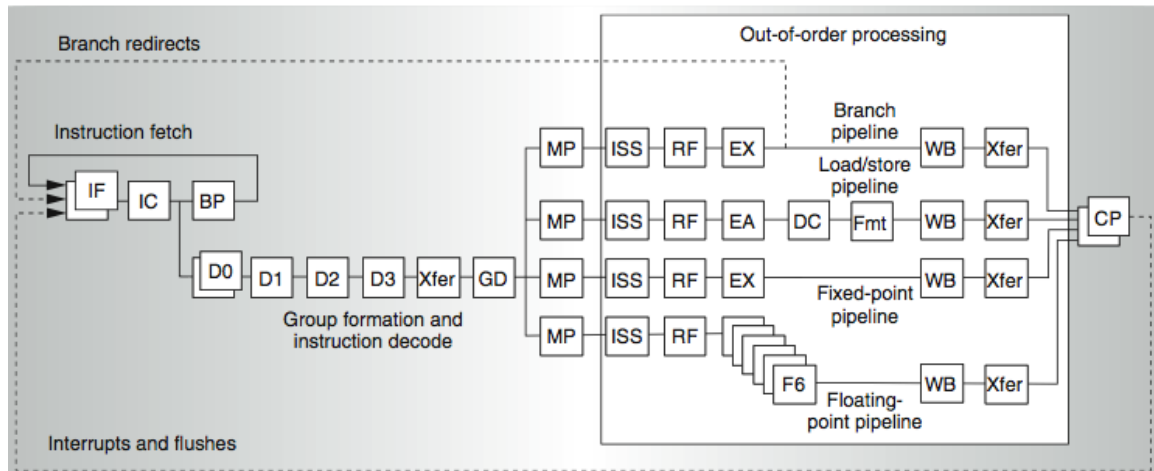==

Instructions: Time **12** minutes. Closed books and notes. No calculators. Please answer all problems in the space provided. **No questions are allowed**.

<Every problem 3 marks>

Q. What are the three main problems of the first generation of VLIW processors?

1. **Increase in code size**
2. **Operated in lock-step; no hazard detection HW**
3. **Binary code compatibility**

Q. Draw the organization of the Power 5 processor's pipeline?

Q. For the directory-based cache coherence protocol studied in the class, draw the **directory** state machine.