3.

1. (A,C), (A,D), (A,E); (B,D), (B,E); (C,F); (D,F), (D,G); (E,F), (E,G); (F,H), (F,I); (G,H), (G,I)
2. B-E-F-H
3. ABCDEFGHI (there are many other permutations, as long as it follows topological ordering)
4. 20 days
5. Apr.26, since Apr.7+20-1=Apr.26
6. Yes, task D can NOT be started until task A and task B are completed. Since the latest finish date for task A and task B is Apr.11, task D can start on Apr.12. Thus we start task D on Apr.14 is possible.
7. Yes, the latest start date of task D is Apr.14(Apr.7+3+4= Apr.14). Since Apr.18 is 4 days longer than Apr.14, the project will be delayed by 4 days. It will be done on Apr.30.
8. Apr.26. since the I was not in the critical path, so we only need to compare with the original completion time Apr.26 for H. In other words, if I starts at Apr.27-2+1=Apr. 26, then the completion time becomes Apr. 27, later than the original Apr. 26.
9. y needs to finish first, then x can be started. So, xRy means y is earlier. R is obviously reflexive since a task x equals to itself.

Suppose . If xRy is true, task x is not started until y is completed, and thus y must have been started before x is completed, which means yRx is false. This makes the only chance to have both xRy and yRx be true is to let x = y, which is true since R is reflexive. This shows R is antisymmetric. Suppose . If both xRy and yRz are true, which means y is completed before x is started, and z is completed before y is started, thus z is completed before x is started and xRz becomes true. So R is transitive

1. BRJ = False, IRC = True, CRD = False
2. infimum of E,F: E, supremum of E,F: F; infimum of C,E: A, supremum of C,E: F
3. no, not all pairs of tasks uniquely meet or join each other.