…here's the **answer key** with very short explanations.

1. **b) $1/r^2$** — Electric field of a point charge falls off as inverse square of distance.
2. **b) Net electric field due to all charges cancels** — E = 0 means vector sum of fields = 0, not necessarily absence of charge.
3. **b) Cannot intersect** — Crossing would give two directions of E at one point (impossible).
4. **a) On axial line** — Dipole field is stronger on the axial line than on the equatorial line.
5. **c) 8** — BCC coordination number = 8.
6. **a) 1** — SC has 8 corner atoms each contributing 1/8 → effective 1 atom per cell.
7. **b) Face diagonal** — In FCC atoms touch along the face diagonal.
8. **b) (a,a) ∈ R for all a ∈ A** — That is the definition of reflexive.
9. **c) Symmetric & reflexive** — It contains (a,a) for all a (reflexive) and (1,2) with (2,1) (symmetric).
10. **c) Equivalence relation** — Reflexive + symmetric + transitive together define an equivalence relation.