Question. 1: Design a concrete mix for 1 cubic yard using the ACI method to achieve a compressive strength of 4,500 psi at 28 days. Use the following parameters:

1. **Maximum aggregate size**: 3/4 inch
2. **Slump**: 4 inches
3. **Water-cement ratio (w/c)**: 0.50
4. **Air content**: 2% (for non-air-entrained concrete)
5. **Specific gravity of cement**: 3.15
6. **Specific gravity of coarse aggregate**: 2.70
7. **Specific gravity of fine aggregate**: 2.65
8. **Dry-rodded unit weight of coarse aggregate**: 110 lb/ft³
9. **Moisture content of aggregates**: 1%
10. **Absorption capacity of aggregates**: 2%

Question 2: Design a concrete mix for 1 cubic meter using the British Standard (BS) method to achieve a compressive strength of 5500 psi (approximately 38 MPa) at 28 days. Use the following parameters:

- **Maximum aggregate size:** 20 mm
- **Slump:** 75 mm
- **Water-cement ratio (w/c):** 0.40
- **Air content:** 2% (non-air-entrained concrete**)**
- **Specific gravity of cement:** 3.15
- **Specific gravity of coarse aggregate:** 2.70
- **Specific gravity of fine aggregate:** 2.65
- **Dry-rodded bulk density of coarse aggregate:** 1600 kg/m³
- **Moisture content of aggregates:** 2%
- **Absorption capacity of aggregates:** 1%

Note: Assume anything if needed.