

- Define hardness and coagulation
- Difference between asphalt and tar
- Water cement ratio and its effect on strength
- Concrete mix design problem
- Marshal or Superpave
- Sieve analysis Mix of aggregates drawing the graph (first HW )
- Calculation of specific gravity (dry/SSD), Absorption, and moisture in aggregates
- Definition of corrosion
- The test used to determine the toughness of metals that is the energy required too fracture
- Types of cement
- Fineness modulus
- Curing and hydration
- Acceptance tests for cement
- Soundness and durability of aggregates

1. Determine Specific Gravity of aggregate (know and memorize the formulae)
2. Sieve analysis like first homework
3. The ability of aggregate to withstand weathering is defined as soundness or durability. Water that freezes inside the voids of aggregates generates stresses that can fracture the stones. passing the 0.045mm sieve (No.325) (ASTM C430)
4. Types of cement and where to use each
5. What do we mean by curing and hydration?
6. Compressive Strength: measured by preparing 50 mm cubes and subject them to compression (ASTM C109). Minimum values of compressive strength in ASTM C150
7. Concrete Mix design problem like homework (all formulae and tables are given)
8. Properties of liquid asphalt
9. Tests on asphalt alone

Some Tests for the performance of asphalt binders:

Flash point: at high temperatures, asphalt can flash or ignite in the presence of open flame or spark. The flash point test is a safety test that measures the temperature at which the asphalt flashes. The Cleveland open cup method (ASTM D92).

Solubility Test: check for impurities in asphalt. Asphalt is totally soluble in carbon tetrachloride.

Distillation Test: Cutback and emulsion: check on factory if specifications are correct. Volatile liquid will be distilled and the black stuff stays so we check the ratios.

Specific Gravity Test: Check for density.

10. Marshall Stability problem (all formulae and tables are given) VTM, VFA, VTA

11. Difference between hard and mild steel and stress/strain diagram for steel

12. Wood word document on Moodle