

## Concrete Technology (Code No: A50116)

### UNIT - I:

**Cement:** Portland cement- chemical composition- Hydration of cement- Structure of hydrate cement- Test on physical properties- Different grades of cement.

**Admixtures:** Types of admixtures- mineral and chemical admixtures- properties- dosages- effects- usage.

**Aggregates:** Classification of aggregate- Particle shape & texture- Bond, Strength & other mechanical properties of aggregate- Specific gravity, Bulk density, Porosity, adsorption & moisture content of aggregate- Bulking of sand- Deleterious Substance of aggregate- Soundness of aggregate- Alkali Aggregate reaction- Thermal properties- Sieve analysis- Fineness modulus- Grading curves- Grading of fine & coarse Aggregates- Gap graded aggregate- Maximum aggregate size.

### UNIT - II:

**Fresh Concrete:** Workability- Factors affecting workability- Measurement of workability of tests- Setting times of concrete- Effect of time and temperature on workability- Segregation & bleeding- Mixing and vibration of concrete- Steps in manufacture of concrete- Quality of mixing water.

### UNIT - III:

**Hardened Concrete:** Water/ Cement ratio- Abram's Law- Gelspae ratio- Nature of strength of concrete- Maturity concept- Strength in tension & compression- Factors affecting strength- Relation between compression & tensile strength- Curing.

**Testing of Hardened Concrete:** Compression tests- Tension tests- Factors affecting strength- Flexure tests- Splitting tests- Pull- out tests, Non- destructive testing methods- codal provisions for NDT.

ELASTICITY, CREEP & SHRINKAGE- Modulus of elasticity- Dynamic modulus of elasticity- Poisson's ratio- Creep of concrete- Factors influencing creep- Relation between creep & time- Nature of creep- Effects of creep- Shrinkage - types of shrinkage.

### UNIT - IV:

**Mix Design:** Factors in the choice of mix proportions- Durability of concrete- Quality Control of concrete- Statistical Quality control- Acceptance criteria- Proportioning of concrete mix by normal pumpable concretes by- BIS method of mix design.

### UNIT - V:

**Special Concretes:** Light weight concrete- Light weight aggregate concrete- Cellular concrete- No-fines concrete- Fiber reinforced concrete- Polymer concrete- Types of Polymer concrete- Self compacting concrete.