

### 3.3 Classification of concrete:

#### 1. According to binding material

- Cement concrete
- Lime concrete.

#### 2. According to Design Of Concrete

- Plain cement concrete.
- Reinforced cement concrete (RCC).
- Pre-stressed cement concrete (PCC).

#### 3. According to purpose

- Vacuum concrete
- Air entrained concrete
- Light weight concrete

#### 4. According to strength

- Light weight concrete
- Medium weight concrete
- Heavy weight concrete

#### 1. According to binding material:

##### i)Cement Concrete:

- The concrete consisting of cement, sand and coarse aggregates mixed in a suitable proportions in addition to water is called cement concrete.
- In this type of concrete cement is used as a binding material, sand as fine aggregates and gravel, crushed stones as coarse aggregates.

##### ii)Lime Concrete:

- The concrete consisting of lime, fine aggregates, and coarse aggregates mixed in suitable proportions with water is called lime concrete.
- In this type of concrete hydraulic lime is generally used as a binding material, sand and cinder are used as fine aggregates and broken bricks, gravel can be used as coarse aggregates.

#### 2. According to Design of Concrete

##### i)Plain Cement Concrete:

The cement concrete in which no reinforcement is provided is called plain cement concrete or mass cement concrete. This type of concrete is strong in taking compressive stresses but weak in taking tensile stresses.

#### **USES:**

Plain cement concrete is commonly used in for foundation work and flooring of buildings.

#### **ii) Reinforced Cement Concrete(Rcc)**

- The cement concrete in which reinforcement is embedded for taking tensile stress is called reinforced cement concrete.
- In this type of concrete the steel reinforcement is to be used generally in the form of round bars, 6mm to 32mm dia.
- This concrete is equally strong in taking tensile, compressive and shear stresses.
- Usual proportions of ingredients in a reinforced concrete are 1part of cement:1-2parts of sand:2-4parts of crushed stones or gravel.

#### **USES:**

- RCC is commonly used for construction of slabs, beams, columns, foundation, precast concrete.

#### **iii) Pre-stressed Cement Concrete (Pscc)**

- The cement concrete in which high compressive stresses are artificially induced before their actual use is called pre-stresses cement concrete.
- In this type of cement concrete, the high compressive stresses are induced by pre-tensioning the reinforcement before placing the concrete, and the reinforcement is released when final setting of the concrete take place.

#### **Uses:**

- This concrete can take up high tensile and compressive stresses without development of cracks. The quantity of reinforcement can be considerably reduced by using this concrete.

### **3. According to purpose**

**i) Vacuum concrete:** The cement concrete from which entrained air and excess water is removed after placing it, by suction with the help of vacuum pump is called vacuum concrete. In this concrete the excess water which is added to increase workability but

not required for the hydration of cement of concrete is removed by forming vacuum chamber

**ii) Air entrained concrete:**

The concrete prepared by mixing aluminum in it is called air entrained ,cellular or aerated concrete. In this concrete bubbles of hydrogen gas are liberated which forms cell and make the concrete cellular.

**USES:**

This concrete is used for lining walls and roofs for heat and sound insulation purpose.

**iii) Light weight concrete:**

The concrete prepared by using coke breeze, cinder or slag as coarse aggregate is called light weight concrete. The concrete is light in weight and posses heat insulating properties.

**USES:**

This concrete is used in making precast structural units for partition and wall lining. 4.

**According to strength**

i. Light weight concrete-2200 kg/m<sup>3</sup>

- Not used for load bearing structures

ii. Medium weight concrete-2400 kg/m<sup>3</sup>

- For normal construction

iii. Heavy weight concrete-2800 kg/m<sup>3</sup>

- Load bearing structures such as dam ,bridges