

DEPARTMENT OF CIVIL ENGINEERING
Concrete Technology Question Bank (2018-19 AY)

Year: II Year

Branch: CIVIL

Semester: II SEM

Unit-1 INGREDIENTS OF CONCRETE CEMENTS&ADMIXTURES

1. (a) Explain the classification of admixtures.
(b) Explain the various tests to obtain the physical properties of cement.
2. (a) Explain the alkali-aggregate reaction and the factors influencing the alkali aggregate reaction.
(b) Explain the importance of grading of aggregates and describe the various types of gradation.
3. (a) Explain the mechanism of hydration of cement.
(b) With neat examples explain various performance of super Plasticizer in modifying the performance of concrete.
4. (a) Explain the classification of aggregates.
(b) Describe the various mechanical properties of aggregates.
5. (a) Explain the chemical composition of Portland cement.
(b) Explain the importance of fineness of cement and describe the various tests to obtain the soundness of cement.
6. Explain the following mineral admixtures
 - (a) Fly ash
 - (b) Blast furnace slag
 - (c) Silica fume

Unit-2 FRESH CONCRETE

1. (a) Define workability and explain the factors affecting the workability of concrete.
(b) Distinguish between segregation and bleeding of concrete
2. (a) Explain the various methods of measurement of workability of concrete..
(b) Explain the various methods of mixing of concrete.
3. (a) Explain the influence of temperature and time on workability of concrete.
(b) Explain the various methods of vibration of concrete.
4. (a) Explain the Setting times of concrete.
(b) Explain Ready mixed concrete.
5. (a) List out various field and laboratory tests that are conducted to assess the properties of fresh concrete.

(b) Explain Compaction Factor test describing the test equipment. Compare the Compaction factor values to Slump of the concrete for different workability.

6. Discuss in detail the various stages of manufacture of concrete.

Unit-3 HARDENED CONCRETE

1. (a) Define curing and explain the various methods of curing of concrete.
(b) Explain the influence of water-cement ratio on the strength of concrete.
2. (a) Explain the various non-destructive testing methods of concrete.
(b) Explain the different methods of obtaining the tensile strength of concrete.
3. (a) Explain the method of obtaining the flexural strength of concrete.
(b) Explain the ultrasonic pulse velocity test for the evaluation of concrete.
4. (a) Explain the influence of gel-space ratio on the strength of concrete.
(b) Explain the maturity of concrete. Also describe its importance in the concrete construction industry.
5. (a) Explain the factors influencing the compressive strength of concrete.
(b) Explain the various codal provisions for Non-destructive testing methods of concrete.
- 6 (a) Explain Abrams water/cement ratio law and compare it with Gel/space ratio law.
(b) Calculate the gel space ratio and the theoretical strength of a sample of concrete made with 500 gm of cement with 0.40 water / cement ratio on full hydration and at 75% hydration.

Unit-4 ELASTICITY CREEP & SHRINKAGE

1. (a) Explain the various elastic moduli of concrete.
(b) Explain the factors affecting the shrinkage and creep of concrete.
2. (a) Explain the static and dynamic moduli of elasticity of concrete.
(b) Explain the method of obtaining the dynamic modulus of elasticity of concrete.
3. (a) Draw the stress-strain curve for concrete and explain the method of determination the various elastic moduli of concrete.
(b) Explain creep and shrinkage of concrete and the factors influencing the creep of concrete.
4. (a) Explain the factors affecting the strength of hardened concrete.
(b) Estimate the strength of concrete at 21 days using maturity concept for M40 Grade cement cured at 120C for 4 hours and 180C for 8 hours and 210C for the rest of the period? Plowman's coefficients are A = 21 and B = 61.
5. (a) Explain the relation between modulus of elasticity and strength of concrete.
(b) Describe the creep of concrete and explain the variation of creep with time.
6. (a) Explain the factors affecting the creep and shrinkage of concrete.
(b) Explain Poission's ratio. How do you find the Poission's ratio of concrete?

Unit-5 MIXDESIGN

1. (a) Explain the various factors influencing the durability of concrete.
(b) Explain the procedure for the mix design of M25 grade of concrete as per the Bureau of Indian standards method.
2. (a) Explain the factors influencing the mix proportions of concrete.
(b) Explain the quality control of concrete and the acceptance criteria.
3. (a) Explain the statistical quality control of concrete.
(b) Explain the various methods of proportioning of concrete mixes.
4. Design M 30 grade of concrete using the following data:
Grade of cement: 53 Grade OPC
Degree of quality control: Good
Maximum size of aggregate: 20 mm
Slump required: 75 mm
Fineness modulus of coarse aggregate: 6.2
Fineness modulus of fine aggregate: 3.2
Density of coarse aggregate: 1500 kg/m³
Density of fine aggregate: 1450 kg/m³
Sand: Zone II
Assume any other data suitably.
5. (a) What is the field corrections to be carried out for concrete mixes? explain?
(b) What are different variables in proportioning that influence mix design.
6. (a) Explain what is mix design and its practical necessity.
(b) Explain the durability considerations in the design of concrete mixes as per IS 456-2000.

Unit-6 SPECIAL CONCRETES

1. Explain the following:
(a) Self-consolidating concrete
(b) Cellular concrete
 2. Explain the following:
(a) Explain the properties of polymer concrete.
(b) High density concrete
 3. (a) Explain the various types of fibres used in concrete
(b) Explain the factors affecting properties of fibre reinforced concrete.
 4. Explain the following:
(i) Light weight aggregate concrete (ii) Types of Polymer concrete
 5. Explain the following:
(i) High performance concrete (ii) No-fines concrete
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6. List out the concretes categorized as special concretes. What are the objectives of special concretes?