

ADVANCED CONCRETE TECHNOLOGY

Time: 3 hours

Max.Marks:100

Answer any FIVE questions  
All questions carry equal marks

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- 1.a) What is meant by Heat of hydration? Explain the methods of reducing the same.  
b) Write in detail about the characteristics of aggregate which are used in making of good concrete. [10+10]
- 2.a) Write short notes on any three popular tests used to determine the workability of concrete emphasizing the applicability of each method.  
b) Explain Abram's Law. Write short notes on Gel Space ratio concept for concrete. [10+10]
- 3.a) Write short notes on Non Destructive Testing methods and their applications for concrete.  
b) Write short notes on Shrinkage of concrete emphasizing on different types and factors affecting shrinkage and methods of mitigating the same. [10+10]
- 4.a) Explain the various data display methods used in quality assessment of concrete.  
b) Design M 25 grade of concrete by using BIS (IS: 10269 – 2009) method.  
The following are the design parameters:  
Grade of concrete: M25, Type of cement: OPC 43 grade conforming to IS: 8112  
Maximum size of coarse aggregate: 20 mm, Exposure condition ((as per IS: 456): Severe, Workability: 100 mm Slump, Degree of supervision: Good, Type of aggregate: Crushed angular aggregate  
Cement : 43 grade with specific gravity 3.15  
Sand : conforming to zone II (as per IS:383)with specific gravity 2.6  
Coarse Aggregate : Conforming to IS: 383, 20 and 10 mm mixed in the ratio 60 : 40 with specific gravity 2.67  
Free moisture : CA – Nil, sand – Nil  
Water absorption : CA – 0.5% and fine aggregate – 1%  
Assume any other data if required [10+10]
- 5.a) Explain the factors affecting the properties of Fibre Reinforced Concrete (FRC).  
b) Write short notes on light weight aggregate concrete and its applications. [10+10]
- 6.a) Write the different types of Super Plasticizers. What are the effects of Super Plasticizer on the fresh and hardened properties of concrete?  
b) Write the various stages in the manufacturing of concrete. Describe the significant variables affecting the workability of concrete. [10+10]
- 7.a) Explain the method of determining the Elasticity Modulus of concrete as per IS 516.  
b) Explain the theoretical considerations for high strength concrete mix proportions. [10+10]
- 8.a) Explain the significance of quality control in manufacturing of concrete.  
b) What are the main aspects of High Performance Concrete according to ACI Committee? What are the general categories of performance requirements of High Performance Concrete? [10+10]

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