

**IV B.Tech. II Semester Supplementary Examinations, July -2005**  
**CONCRETE TECHNOLOGY**  
**(Civil Engineering)**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) What is heat of hydration? How does this affect the quality of concrete.  
(b) Explain how the Bouge's compounds participate in the development of strength of cement.
2. (a) Explain the purpose of aggregates in concrete.  
(b) How does the source affects the quality of aggregate?
3. (a) What is the effect of mixing time and temperature on workability.  
(b) Discuss the various factors which influence the workability of fresh concrete
4. (a) What is the significance of tensile strength of concrete and distinguish between tensile strength in flexure and that in direct tension.  
(b) Describe in detail the 3-point Bending test for measuring the flexural strength of hardened concrete.
5. (a) How do you perform split tensile test on a concrete cylinder in laboratory?  
(b) Explain the flexural test on concrete beam for determining modulus of rupture.
6. (a) Define the term 'Mix Design of Concrete' and explain its significance.  
(b) Briefly discuss various methods of Mix Design available in literature.
7. (a) What is Ready mixed concrete? Where is it produced?  
(b) What precautions one must take while using ready mixed concrete?
8. (a) Explain the acceptance critia for compressive strength and flexural strength as specified by I.S. Code.  
(b) Discuss how sampling can be planned to ensure that each concrete batch gets a reasonable chance of being tested.

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1. (a) Compare ordinary Portland cement viz-a-viz Portland pozzolana cement.  
(b) Discuss how Portland slag cement is manufactured? What are the advantages of using this cement?
2. Bring out the detailed classification of aggregates and explain each one of them briefly.
3. (a) Define the term Workability? Explain its significance.  
(b) How the workability of concrete is to be adjusted according to the size of the aggregate and reinforcement particulars in RCC work?
4. (a) Discuss the various factors that influence the development of strength of hardened concrete.  
(b) Define the term "W/C ratio" and discuss its relation with compressive strength of hardened concrete.
5. (a) Describe the laboratory test for evaluating the tensile strength of hardened concrete. Explain the limitations of this test.  
(b) The split tensile strength test conducted on a 15cm x30cm concrete Cylinder indicated an ultimate load of 120 KN at which the splitting of the cylinder took place. Calculate the tensile strength of concrete in Splitting.
6. (a) Define the term 'Mix Design of Concrete' and explain its significance.  
(b) Briefly discuss various methods of Mix Design available in literature.
7. (a) Bring out a detailed classification of Light Weight aggregates.  
(b) What is No-fines concrete? How is it produced?
8. (a) Explain in detail the statistical approach in quality control of concrete.  
(b) Explain the steps to be taken by site engineer in maintaining quality of concrete.

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1. (a) Bring out a detailed discussion on Portland pozzolana cement and its advantages.  
(b) What is hydrophobic cement? Explain its application.
2. How are metamorphic rocks formed? How are the aggregates obtained from metamorphic rocks different from those obtained from igneous rocks?
3. (a) Explain how workability can be modified using admixtures.  
(b) Explain how surface texture and grading of aggregates influence the workability of fresh concrete.
4. (a) State and explain Abram's w/c ratio law. Discuss its limitations.  
(b) Draw the normal curves depicting the variation of compressive strength of concrete with w/c ratio and cement /water ratio.
5. (a) Describe the laboratory test procedure for conducting compression strength test on concrete cylinders.  
(b) Discuss the relation between cube compressive strength and cylinder compressive strength.
6. (a) Explain the relationship between Mean Design Strength and Specified Minimum strength.  
(b) It is required to design a M25 concrete mix. Calculate the mean target strength. Use I.S. Code method of approach. Explain the basic principle involved.
7. (a) Explain how light weight concrete can be produced by Aeration?  
(b) What are artificial aggregates? How are they useful in production of light weight aggregate concrete.
8. (a) Explain how do you account for variation in test results of concrete.  
(b) Define the term co-efficient of variation and explain how it is useful in quality control of concrete.

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1. (a) Explain different field tests to be conducted on cement while deciding its quality.  
(b) Enumerate the different laboratory tests to be conducted on cement to decide its quality. Explain any two tests of your choice.
2. (a) "The strength of the parent rock does not exactly represent the strength of the coarse aggregate in concrete". Validate the above statement with your reasoning.  
(b) What is the significance of aggregate impact value? Explain how it is determined in the laboratory?
3. (a) Define the term workability as given by Road Research Laboratory.  
(b) Ennumerate the various field tests available for measurement of workability of fresh concrete. Explain any one method in detail.
4. (a) State Abram's W/C ratio law and explain the same. How does Feret improve Abram's law.  
(b) Define the term Gel/space ratio and explain its relation with strength of concrete.
5. (a) How do you perform split tensile test on a concrete cylinder in laboratory?  
(b) Explain the flexural test on concrete beam for determining modulus of rupture.
6. Explain in detail the various steps involved in Designing concrete mixes by American Concrete Institute Method.
7. (a) What is foamed slag? How is it useful in production of light weight aggregate concrete?  
(b) Explain the term sintered fly Ash? How can this material be used in production of light weight concrete?
8. (a) Explain how the Normal distribution curve can be plotted for compressive strength of concrete? How is this curve useful in quality control?  
(b) Define the term standard deviation and explain how it is calculated? Explain where the standard deviation is used in Concrete Technology.

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