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| **Scheme of Valuation/Answer Key**  (Scheme of evaluation (marks in brackets) and answers of problems/key) | | | | | | |
| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  V SEMESTER B.TECH DEGREE EXAMINATION, JULY 2019 | | | | | | |
| **Course Code: CE361** | | | | | | |
| |  | | --- | | **Course Name: ADVANCED CONCRETE TECHNOLOGY** | | | | | | | |
| Max. Marks: 100 | | |  | | Duration: 3 Hours | |
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| **PART A** | | | | | | |
|  |  | ***Answer any two full questions, each carries 15 marks.*** | | | | Marks |
| 1 | a) | Explanation of gap graded aggregate.  Advantages of using gap graded aggregate. | | | | (2)  (2) |
|  | b) | Any seven factors with brief descriptions. (one mark for each factor) | | | | (7) |
|  | c) | Plasticizers, are chemical components that are added to substances to increase the plasticity. Therefore, plasticizers are additives. Increasing the plasticity is equal to softening the substance. It makes the substance flexible and durable.  **Plasticizers can reduce the need for water by 5-15% (2 marks)** | | Super plasticizers are polymers that are used to prevent particle segregation of suspensions. Both plasticizers and Super plasticizers are known as dispersants.  **Super plasticizers can reduce the need for water by 30% (2 marks)** | | (4) |
| 2 | a) | Role of chemical admixtures in concrete  Mention four types of chemical admixtures  Function (0ne mark for each) | | | | (1)  (2)  (4) |
|  | b) | PRODUCTION SAMPLING: Bin Sample, Belt sample  STOCKPILE SAMPLING: Coarse Aggregate, Fine Aggregate  SAMPLING DIRECTLY FROM TRUCKS, RAIL CARS, OR BARGES  Since this portion is not covered adequately in major text books, marks could be given to student if he makes a genuine attempt. | | | | (2)  (2)  (2) |
|  | c) | List the stages- full credits can be given | | | | (2) |
| 3 | a) | Different components of hardened concrete  Transition zone (explanation with fig.) | | | | (2)  (4) |
|  | b) | chemical composition, properties and uses of high alumina cement, quick setting and blast furnace slag cement (3 marks for each) | | | | (9) |
| **PART B** | | | | | | |
| ***Answer any two full questions, each carries 15 marks.*** | | | | | | |
| 4 | a) | carbonation shrinkage (explanation with chemical reaction) | | | | (5) |
|  | b) | explanation with fig. | | | | (4) |
|  | c) | Listing the factors (any six)  Explanation | | | | (3)  (3) |
| 5 | a) | Step-by-step procedure of BIS method of concrete mix design  Step 1: Collection of data (1 mark)  Step 2: Calculation of Target Strength of Concrete (3 marks)  Step 3: Selection of Water-Cement Ratio (2 mark)  Step 4: Determination of Aggregate Air content (1 mark)  Step 5: Selection of Water Content for Concrete (1 mark)  Step 6: Selection of Cement Content for Concrete (1marks)  Step 7: Calculation of Aggregate Ratio (1 mark)  Step 8: Calculation of Aggregate Content for Concrete (2mark)  Step 9: Trial Mixes for Testing Concrete Mix Design Strength(3 marks)  (each step should be elaborated) | | | | (15) |
| 6 | a) | Influence of mineral admixtures in concrete  Explanation of any twomineral admixture (4marks each) | | | | (2)  (8) |
|  | b) | Define creep  List the factors affecting creep (any three) | | | | (2)  (3) |
| **PART C** | | | | | | |
| ***Answer any two full questions, each carries20 marks.*** | | | | | | |
| 7 | a) | 1. Relative Fiber Matrix Stiffness  2. Volume of Fibers  3. Aspect Ratio of the Fiber  4. Orientation of Fibers(Any six)  5. Workability and Compaction of Concrete  6. Size of Coarse Aggregate  7. Mixing | | | | (6) |
|  | b) | alkali silica reaction (causes, effect, control) (2 marks each) | | | | (6) |
|  | c) | any two non-destructive tests in concrete (4 marks each) | | | | (8) |
| 8 | a) | Any three causes with explanation (2 marks each) | | | | (6) |
|  | b) | * 1. Ready mixed concrete   2. Mass concrete | | | | (5)  (5) |
|  | c) | Advantages (any 2) and limitations (any 2) of UPV method | | | | (4) |
| 9 | a) | Reasons for adopting, advantages and uses of prefabrication (2marks, 3marks, 5 marks) | | | | (10) |
|  | b) | Influence of cement, water, aggregates and admixture (2½ marks each) | | | | (10) |
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