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**C Reg. No. :**

**Question Paper Code: 55P61**

M.E. DEGREE EXAMINATION, NOV 2017

Elective

Structural Engineering

15PSE507 – ADVANCED CONCRETE TECHNOLOGY

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

(IS 456: 2000, IS 10262:2009 and Charts from ACI 211.1-91-1991 and DOE1988 are permitted)

PART - A (5 x 1= 5 Marks)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1. | Le- Chatelier apparatus is used to determine | | | | CO1- R |
|  | (a) Workability | | (b) Soundness of cement | | |
|  | (c) Initial setting time | | (d) Final setting Time | | |
| 2. | Kelly ball test is used to determine | | | CO2- R | |
|  | (a) Workability | (b) Density | (c) Voids | (d) Compressive strength | |
| 3. | The root mean square value of all the results is called as | | | CO3- R | |
|  | (a) Variance | | (b) Standard Deviation | | |
|  | (c) Mean strength | | (d) None of the above | | |
| 4. | Class F Fly ash is having | | | CO4- R | |
|  | (a) < 5% CaO | (b) < 5% SiO2 | (c) >5% CaO | (d) <5% Al2O3 | |
| 5. | Wet gunny bags are used for | | | CO5- R | |
|  | (a) Curing | | (b) Mixing | | |
|  | (c) Drying | | (d) Floating | | |

|  |  |  |  |  |
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|  | PART – B (5 x 3= 15Marks) | | | |
| 6. | Classify aggregates and explain. CO1- U | | | |
| 7. | Define: Creep CO2- U | | | |
| 8. | Define: Standard Deviation and Coefficient of variation. CO3 -U | | | |
| 9. | Give the salient features of High Performance concrete. CO4- U | | | |
| 10. | Define :curing. CO5- U | | | |
|  | PART – C (5 x 16= 80Marks) | | | |
|  |  |  |  |  |
| 11. | (a) | How would you conduct the aggregate crushing value and impact value test? What are the acceptance criteria? | CO1-U | (16) |
|  |  | Or |  |  |
|  | (b) | Discuss the need for admixtures in concrete and explain the various admixtures used to improve the workability of concrete. | CO1-U | (16) |
|  |  |  |  |  |
| 12. | (a) | Explain in detail any two types of tests for determining the workability of concrete. | CO2- U | (16) |
|  |  | Or |  |  |
|  | (b) | Discuss in detail the following properties of concrete:  (i) Segregation and (ii) Bleeding | CO2- U | (16) |
|  |  |  |  |  |
| 13. | (a) | Design a concrete mix for M30 grade concrete using IS recommended guidelines. Assume necessary data. | CO3- App | (16) |
|  |  | Or |  |  |
|  | (b) | Design a concrete mix for M40 grade concrete using ACI recommended guidelines. Assume necessary data. | CO3- App | (16) |
|  |  |  |  |  |
| 14. | (a) | (i) Discuss any two test procedures conducted for self compacting  concrete. | CO4- U | (8) |
|  |  | (ii) What are the factors affecting the properties of fibre reinforced  concrete? | CO4- U | (8) |
|  |  | Or |  |  |
|  | (b) | With neat sketches explain the various tests conducted to test the properties of fresh self compacting concrete. | CO4- U | (16) |
|  |  |  |  |  |
| 15. | (a) | Enumerate and explain the problems that are encountered while concreting in hot weather. | CO5- U | (16) |
|  |  | Or |  |  |
|  | (b) | Explain the step by step procedure in vacuum dewatering of concrete. | CO5- U | (16) |