

4E2033

B. Tech. (Sem. IV) (Main&Back) Examination, June/July - 2011

Civil Engg.

4CE2 Concrete & Construction Technology

Time : 3 Hours]

[Total Marks : 80

[Min. Passing Marks : 24

Attempt any **five** questions, selecting one question from each unit.
All questions carry equal marks.

Use of following supporting material is permitted during examination.

(Mentioned in form No. 205)

1. _____ IS : 10262

2. _____ IS : 456

UNIT I

- 1 (a) Discuss 'permeability' of concrete and factors influencing it. 6
- (b) Describe standard test procedure as per the IS code for compressive strength test of hardened concrete. How is the size of specimen related with maximum size of aggregate in concrete ? 6
- (c) Discuss in brief method to determine air content of concrete and factor affecting it. 4

OR

- 1 Design concrete mix of M40 grade with IS method. Given : Cement of 43 Grade OPC with 28 days compressive strength equal to 46N/mm^2 , aggressive exposure condition for concrete, aggregate 40mm nominal size, good quality control at site to produce concrete of 0-25 mm slump; river sand of zone I, available coarse aggregates with following three partize size fractions (Sieve analysis results) :



Sieve size % passing	I	II	III
40 mm	60	100	100
20 mm	03	70	95
10 mm	—	10	55

Water absorption value for all the three types of coarse aggregates and the river sand is equal to 0.70%. Free moisture in all the aggregates can be assumed to be equal to 0.1%. Determine the final quantities required per cubic meter of concrete of cement, sand, three types of coarse aggregates (individually) and water in incorporating due correction as per the IS code.

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UNIT - II

- 2 (a) Discuss appropriate curing methods and duration for the cases mentioned below, if more than one method is to be employed for one case, discuss duration of each.
 - (i) Concrete pavement with pavement quality concrete of Grade M45 and pavement is four lane with divider. 4
 - (ii) Columns (with M30) in ambient temperature of 46°C and 30°C with relative humidity of 25% and 80% respectively. 2
- (b) Discuss appropriate concrete compaction method for the two cases mentioned in Q. 2 (a) 2
- (c) Discuss appropriate admixtures in concrete for pumpable concrete to be placed 50 m high and 40 m horizontal boom length. The concrete is to be pre mixed and transported with required slump of 100-120 mm after 60 minutes of its production at the batching plant. 2
- (d) Discuss typical applications of M50, M60, M75 Grades of concrete. 3
- (e) Which are the different types of accelerators; Write advantages and limitations of each and typical dosages in concrete. 3



- (f) Write typical value of possible range of reduction in water content of concrete with use of
- Water reducing agents
 - Super - plasticizers

2

OR

- 2 (a) Describe advantages of use of flyash in concrete and precautions while its use in concrete. 4
- (b) What are the difference in physical and chemical properties of flyash and silicafume. **rtuonline.com** 6
- (c) Write typical mix constituents for production of M70 Grade concrete limiting cement content per cubic metre of concrete equal to 450 kg/m^3 . Typical dosages of admixtures need specifically be mentioned. 4
- (d) Compare interrelation between different salient properties of high strength concrete, with that in ordinary strength concrete. 2

UNIT - III

- 3 (a) Write typical recommended formwork sizes for the concrete slab 300mm thick for application as defined in Q.2(a)(i) and concrete column of size $300 \times 450 \text{ mm}$ for application as defined in Q.2(a)(ii). 2
- (b) For which applications, slip and moving formwork is recommended ? 2
- (c) Discuss different methods and their suitability for earthwork in different types of soils. 6
- (d) Describe methods of 'marking' the foundation plan and associated issues. 6

OR

- 3 (a) Discuss causes of dampness in buildings. 4
- (b) Describe effects of dampness in buildings. 4
- (c) Describe methods and materials for anti termite treatment in buildings in detail. 8



UNIT - IV

- 4 (a) Describe construction details with nomenclature of materials used in different types of joints.

8

- (b) Describe requirements of good staircase and suitability of different types of stairs for different types of buildings. Explain with figures.

8

OR

- 4 (a) Show different shapes of arches through figures and write about their construction details.

6

- (b) Discuss components of lifts; explain with help of figures.

6

- (c) Explain the construction system of multi storeyed building frames and concrete skeleton system.

4

UNIT - V

- 5 (a) Discuss the construction of sub base and base for ground floors.

4

- (b) Discuss construction details of terrazzo flooring including curing, grinding and finishing.

8

- (c) Explain king post roof truss construction details with figure.

4

OR

- 5 (a) Describe the method of laying AC sheet on a steel truss with purlins. Sketch the details of fixing AC sheets to any rolled steel section (as purlin).

6

- (b) For a multistorey apartment building, light weight floors need to be adopted. What type of floors would you suggest? Sketch the arrangement of such floors. What special features are to be provided at the four edges of such floors, if any?

6

- (c) Explain the method of laying Mangalore tiles on a pitched roof?

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