

December 2017

CONCRETE TECHNOLOGY

Time Allowed: 3 Hours

Full Marks: 70

Answer to Question No.1 is compulsory and to be answered first.

This answer is to be made in separate loose script(s) provided for the purpose.

Maximum time allowed is 45 minutes, after which the loose answer scripts will be collected and fresh answer scripts for answering the remaining part of the question will be provided.

On early submission of answer scripts of Question No.1, a student will get the remaining script earlier.

Answer any five questions from the rest.

1. Answer the following questions (any twenty):

20x1

- i) To counteract the flash setting, after burning _____ is added to pulverized cement clinker.
- ii) The chemical reactions that take place between cement and water is referred as _____.
- iii) The full form of B.I.S. _____.
- iv) By $0.7\sqrt{f_{ck}}$ we determine _____ of concrete.
- v) Graphical representation of f_{ck} vs. $1/WCR$ is _____ in nature.
- vi) The top diameter of typical slump test mould is _____.
- vii) Slump of 25 mm indicates _____.
- viii) If super plasticizer is used then water shall be reduced by _____%.
- ix) What are the oxide compositions in cement?
- x) 53 grade of cement, what it indicates?
- xi) For M20, mix 1:2:4 what it means _____.
- xii) Vee-Bee test for workability is considered for _____ workable concrete.
- xiii) For mass concrete works _____ cement is the most suitable.
- xiv) Specified compressive strength of concrete cubes are measured after _____ days.
- xv) The material added in cement to avoid flash set is _____.
- xvi) The minimum period of curing in concrete as per Indian standard is _____.
- xvii) Efflorescence in concrete occurs due to an excess of _____.
- xviii) If water cement ratio is 0.45 then water required per bag of cement is _____ kg.
- xix) When the formwork of casting is to be removed early, _____ cement is used.
- xx) The heat generated during setting & hardening of cement is called _____.
- xxi) M25 grade of concrete indicates the compressive strength after 28 days, equal to _____.
- xxii) The compacting factor test of concrete determines its _____.
- xxiii) Aluminium powder is _____ admixture.
- xxiv) According to IS 456-2000 minimum grade of concrete to be adopted for prestressed concrete is _____.

- 2. a) Name any three types of cement, their properties & uses.
- b) Describe the manufacturing process of cement.

(3x2)+4

- 3. a) What are the functions of admixture?
- b) What are the different types of admixture? Explain with example.
- c) Name one commonly used accelerator.

3+6+1

- 4. a) What is segregation in concrete? What are the causes of segregation?
- b) What are the causes of bleeding in concrete can be controlled?

5+5

- 5. a) Define Mix Design.
- b) What are the variable factors to be considered during Mix Design?
- c) Write the differences between ordinary concrete & controlled concrete.

2+4+4

6. Write short notes on the followings (any two): 2½x4
- Batching of concrete
 - Plasticizers
 - Ready Mix Concrete
 - Sulphate Resisting Cement
7. a) Explain the cold weather concreting. What are the precautions to be taken?
b) What are the different methods of underwater concreting? 5+5
8. What are the causes of unsoundness of cement? What is the influence of fineness of cement for its hydration? How can the heat of hydration of cement be reduced? What is the difference between initial set and final set? What is the difference between false set and flash set? 2+1+2+3+2
9. What do you know by term Pre-tensioning? What do you know by term Post-tensioning? What is the minimum grade of concrete we can use in this case? Name the relevant IS-Code for the Pre-stressed concrete. Define the term tendon and Anchorage. 2+2+2+1+3
10. Following are symptoms – suggest their possible cause, prevention and remedy. 10
- cracks in horizontal surface
 - cracks originating from the depth of surface
 - voids in concreting and honeycombing
 - vertical surface erosion
 - colour variation
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