Question Paper Code : 71508

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Sixth Semester

Civil Engineering

CE 6002 — CONCRETE TECHNOLOGY

(Regulations 2013)

Time : Three hours Maximum : 100 marks

(Use Relevant Tables and Charts of IS 10262)

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the different types of tests conducted on coarse aggregates?
2. Write any two advantages of sulphate resistance cement.
3. What is the importance of water proofers added in cement concrete?
4. Define metakaoline.
5. Write any four grades of cement concrete.
6. On what circumstances high grade concretes are utilized effectively?
7. What are the advantages of ring tension test?
8. Define bleeding.
9. Enumerate SIFCON.
10. Write any two advantages of geopolymer concrete.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the effect of properties of aggregate on quality of concrete. (8)

(ii) What is the effect of water cement ratio on strength and durability of concrete? (8)

Or

(b) (i) Explain Mechanical properties of OPC. (8)

(ii) Compare the physical properties of 33,43 and 53 grades of concrete. (8)

12. (a) Differentiate between accelerators and retarders with suitable examples and also how you can determine dosage of admixtures? (16)

Or

(b) Explain the effect of concrete properties while adding silica fume and GGBS. (16)

13. (a) Design a concrete mix for M_{40} grade of concrete using IS method with the following data :

(i) Type of cement – OPC 43 grades

(ii) Maximum size of aggregate – 20 mm

(iii) Exposure condition – Severe (RCC)

(iv) Workability – 125 mm slump

(v) Minimum cement content – 320 kg/m^3

(vi) Maximum W/C – 0.45

(vii) Method of placing concrete – Pumping

(viii) Degree of supervision – good

(ix) Type of aggregate – Crushed angular aggregate

(x) Super plasticizer will be used

(xi) Specific gravity of coarse aggregate – 2.80

(xii) Specific gravity of fine aggregate – 2.70

(xiii) Water absorption : Coarse aggre. – 0.5%, fine aggre. – 1%,

Grading of coarse aggregate is conforming to Table 2 of IS 383 and grading of fine aggregate is falling in zone II.

Or

(b) Design a concrete mix for M_{30} grade of concrete using F type fly ash. Adopt BIS method with the following data :

(i) Type of cement – OPC 43 grades

(ii) Maximum size of aggregate – 20 mm

(iii) Exposure condition – Severe (RCC)

(iv) Workability – 100 mm slump

(v) Minimum cement content – 320kg/m^3

(vi) Maximum W/C – 0.46

(vii) Method of placing concrete – Pumping

(viii) Degree of supervision – good

(ix) Type of aggregate – Crushed angular aggregate

(x) Super plasticizer will be used

(xi) Specific gravity of coarse aggregate – 2.80

(xii) Specific gravity of fine aggregate – 2.70

(xiii) Specific gravity of fly ash – 2.2

(xiv) Water absorption : Coarse aggre.- 0.5%, fine aggre. – Nil.

Grading of coarse aggregate is conforming to Table 2 of IS 383 and grading of Fine aggregate is falling in zone I.

14. (a) Explain the procedure of compressive, tensile and flexural strength tests conducted on cement concrete elements with neat sketch. (16)

Or

(b) Explain the factors influencing the strength of concrete. (16)

15. (a) Explain the following :

(i) Light weight concrete

(ii) Fibre reinforced concrete

(iii) Polymer concrete

(iv) High strength concrete. (16)

Or

(b) Explain the following :

(i) Ferrocemt concrete

(ii) High performance concrete

(iii) Geopolymer concrete

(iv) Shotcrete. (16)