Code No: 115EP

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, March - 2017
CONCRETE TECHNOLOGY
(Common to CE, CEE)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	What is flash set of cement and how to avoid this?	[2]
b)	Explain the mechanism of deflocculating of cement by superplasticizer.	[3]
c)	Define workability in terms of energy.	[2]
d)	Define Laitance and factors responsible for it?	[3]
e)	State Abram's water cement ratio law.	[2]
f)	How does drying shrinkage effect creep?	[3]
g)	State the merits and demerits of BIS mix design method.	[2]
h)	What do you understand by target mean strength?	[3]
i)	Give the application of cellular concrete.	[2]
j)	What is 'no-fines' concrete?	[3]

PART - B

(50 Marks)

2.a) Explain how the Bogue's compounds participate in the development of strength of cement.
b) Explain the effect of h/D ratio and size of aggregate on the strength properties of concrete. [5+5]

OR

3.a) What is Alkali aggregate reaction and how it can be controlled.
b) What are the chemical admixtures? Explain different types of admixtures. [5+5]

4.a) List the factors effecting the workability of concrete.
b) Explain the procedure for determining the setting times of concrete. [5+5]

OR

5.a) Discuss the applicability of the various workability tests to concretes of different levels of workability.
b) Define bleeding and segregation of concrete and Explain the methods to control them. [5+5]

6.a) Calculate the Gel/space ratio and hence estimate the 28 day strength for 50 kg of cement at 0.45 water/cement ratio on 75% hydration.

b) Calculate the maturity value and estimate the 14 days strength for M25 grade concrete if it is cured at 15^0C from 0 hr to 6 hr; 8^0C from 6 hr to 12 hr and 12^0C for the rest of the period during a day. The Plowman's constants are A=21 and B=61. [5+5]

OR

7.a) Define creep of concrete and explain the main factors affecting the creep of concrete.

b) Discuss about static and dynamic moduli of elasticity of concrete along with their relation. [5+5]

8. Design M35 concrete mix using BIS method for the data given below:
   a) Cement-OPC 53 grade; specific gravity-3.05
   b) Fine aggregate- river sand, Zone-III, specific gravity-2.65
   c) Coarse aggregate-20mm crushed granite, specific gravity-2.65
   d) Free moisture in sand is 5% with 10% bulking
   e) Exposure-moderate
   f) RCC work with good quality control
   g) Workability-110mm slump (pumpable concrete)
   Use of SP allowed. Assume any other data suitably. [10]

OR

9.a) Briefly discuss the 'sampling and acceptance criteria' for each concrete batch.

b) What are the factors to be considered in the choice of concrete mix proportions? [5+5]

10.a) Enumerate different types of fibres used for the production of "fibre reinforced concrete" and also state the factors that affect the properties of fibre reinforced concrete?

b) Briefly discuss the tests to be conducted to satisfy the requirements for 'self-compacting concrete' in the fresh state. [5+5]

OR

11.a) Differentiate between polymer concrete and polymer impregnated concrete and also state the principal consideration in the design of polymer concrete mixtures.

b) What are the various methods of making light weight concrete? [5+5]

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