

Total No. of printed pages = 3

CE 131505 (NR)

Roll No. of candidate

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413 / 22 2021

BINA CHOWDHURY CENTER & LIBRARY
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Pavna, Mathura, U.P.
Established in 2017

B.Tech. 5th Semester End-Term Examination

Civil

CONCRETE TECHNOLOGY

(New Regulation)

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No. 1 and any *four* from the rest.

1. Answer the following (MCQ/ Fill in the blanks) : (10 × 1 = 10)
- (i) Which compound gives the colour to the cement?
(a) Lime (b) Silica
(c) Iron Oxide (d) Alumina
- (ii) Workability of concrete can be improved by _____
(a) Increasing size of aggregates (b) Decreasing size of aggregates
(c) Increasing fine aggregates (d) Increasing flaky aggregates
- (iii) The separation of water or water-cement mixture from the freshly mixed concrete is known as bleeding.
(a) True (b) False
- (iv) The pH value of water for concrete construction shall not less than
(a) 3 (b) 4
(c) 5 (d) 6
- (v) What is the main function of set retarders?
(a) Increase curing rate
(b) Slows curing rate
(c) Improves workability at low w/c ratio
(d) Speeds up start of finishing operations

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(vi) Admixtures which cause early setting, and hardening of concrete are called _____.

- (a) Plasticizers (b) Retarders
(c) Super plasticizer (d) Accelerators

(vii) Workability of concrete is directly proportional to _____.

- (a) Grading of the aggregates (b) Time of transit
(c) Aggregates cement ratio (d) Water cement ratio

(viii) Which chemical composition has highest content in OPC?

- (a) Alumina (b) Silica
(c) Lime (d) Iron Oxide

(ix) Vicat's apparatus is used for

- (a) Fineness test (b) Consistency test
(c) Setting time test (d) Soundness test

(x) Aerated Concrete is _____.

- (a) Very heavy weight (b) Heavy weight
(c) Medium weight (d) Light weigh

2. (a) Write a note on properties of concrete? (5)
(b) What is curing? What is its significance? (2+3=5)
(c) What are the advantages and disadvantages of concrete? (5)
3. (a) What do you mean by durability of concrete? What are the various factors which affecting the durability of concrete? (3+4=7)
(b) What are the raw materials used for manufacture of cement? Also state their percentage content. (3)
(c) Suggest some remedial measures for bleeding of concrete. What are admixtures? (3+2=5)
4. (a) Differentiate between Flash set and False set. Write down the role of hydrates of C_4AF in concrete. (2+3=5)
(b) What do you mean by aerated concrete. Explain briefly. (5)
(c) Define the Bogue's compound and specify them along with the formula. (5)
5. (a) Discuss bulking of aggregate and fineness modulus. (3+3=6)
(b) Why are angular aggregate superior to rounded aggregate? (4)
(c) What is rapid hardening cement?Where in this used. (3+2=5)

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Page: _____

6. Determine the proportion of the ingredients of concrete using suitable method from the following data. Also find the actual quantity required for 1 bag of cement for surface dry condition. (15)

- (a) Characteristics compression strength required in the field of 28 days = 20 N/mm^2
- (b) Maximum nominal size of aggregate = 20 mm (angular)
- (c) Fine aggregate conforming to zone III.
- (d) Degree of workability = 50 mm slump
- (e) Standard deviation = 4.00
- (f) Probability factor = 1.65
- (g) Use minimum cement content as 320 kg/m^3 of concrete and maximum w/c as 0.45
- (h) Specific gravity of cement, FA and CA are 3.16, 2.63 and 2.64 respectively.
- (i) Water absorption of FA and CA are 0.50 and 1.00 percent respectively.
- (j) Free surface water content of FA and CA are 0.25 and 0.50 percent respectively.
- (k) Maximum water content for the nominal maximum size of 20 mm aggregate is 186 kg.
- (l) Volume of C.A. per unit volume of total aggregate for the F.A. of Zone III and nominal maximum size of 20mm aggregate is 0.64.
- (m) Take only one trial mix corresponding to W/c 0.45.

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7. (a) Classify aggregate based on geologic origin, size and shape. (5)
- (b) From the following data, find out the value of (i) specific gravity (ii) water absorption

Weight of vessel + water + sample = 1695 gm

Weight of vessel with water = 1400 gm

Weight of saturated surface dried sample in air = 490 gm

Weight of oven dried sample = 480 gm (5)

- (c) Write the procedure of the test for determination of fineness of cement. (5)