

Roll No.

3084

**B. Tech. 4th Semester (Civil)
Examination – May, 2023**

MATERIAL TESTING AND EVALUATION

Paper : PCC-CE-210-G

Time : Three hours]

[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting one question from each Section. Question No. 1 is compulsory. All questions carry equal marks.

1. Describe the following : 3 × 5 = 15

(a) Ceramics and Refractories

(b) Mortar

(c) Creep

(d) Shrinkage of material

(e) Lime

SECTION – A

2. (a) Explain the Plain concrete and reinforced concrete in detail. 7.5
- (b) Explain the function of bitumen and asphalt in construction industry. 7.5
3. (a) Explain the different types of cement used along with their suitability. 7.5
- (b) Explain the proportion of lime and cement mortar used for masonry and plastering. 7.5

SECTION – B

4. (a) Explain the properties of fresh concrete. 7.5
- (b) Explain the freezing and thawing effect of concrete. 7.5
5. (a) Explain in detail British mix design method along with Indian Standard guidelines. 7.5
- (b) Explain ACI mix design method and USBR method for the design of concrete mix. 7.5

SECTION – C

6. (a) Explain the tensile test of steel used in laboratory. 7.5
- (b) Explain the strength of ceramics used in civil engineering. 7.5

7. (a) Explain the brittle failure of steel by the temperature transition approach. 7.5
- (b) Explain the different types of steel used in civil engineering. 7.5

SECTION – D

8. Explain the fracture toughness of different material and procedure to determine the fracture toughness. 15
9. Explain the working of crusher and dozer in field. 15