



M.E DEGREE EXAMINATIONS: DEC 2022

(Regulation 2018)

Third Semester

STRUCTURAL ENGINEERING

P18SEE0004: Smart Materials for Construction

(Use of IS 9103, IS 11384, IS 800, ACI 544.4R-18 are permitted)

COURSE OUTCOMES

CO1: Choose a suitable concrete admixture

CO2: Design steel-concrete composite elements

CO3: Design fiber reinforced concrete mix as per ACI standards

CO4: Suggest composition of geopolymer and ferrocement

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Sequence the following with respect to ferrocement concrete construction process. CO4 [K₁]
 1. Curing
 2. Tying of reinforcement
 3. Mortar placement/application
 4. Design of cement mortar matrix.

a) 1-2-3-4	b) 4-3-2-1
c) 2-4-3-1	d) 3-2-1-4

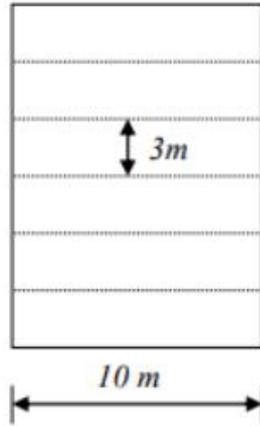
2. Which of the following have a greater impact on longitudinal strength of reinforced composites? CO3 [K₂]

a) Fiber orientation	b) Fiber strength
c) Fiber length	d) Fiber diameter

3. When fibers are used as a dispersed phase for the reinforcement of matrices, the resultant composites are known as _____. CO3 [K₁]

a) Glass-fiber reinforced	b) Carbon-fiber reinforced
c) Wood-fiber reinforced	d) Unidirectional-fiber reinforced

28. Design a simply supported composite beam with 10m span shown (dotted line) in the figure below. The thickness of slab is 130 mm. The floor is to carry an imposed load of 2.8 kN/m² , partition load of 1.4 kN/m² and a floor finish load of 0.75 kN/m². 10 CO2 [K₃]



29. Explain the following. 10 CO1 [K₂]
(i) Accelerating and retarding admixtures.
(ii) Silica fume and Metakaolin
30. Explain the construction of ferrocement water tank with neat diagram. 10 CO4 [K₃]
31. Explain with neat sketches the various types of steel concrete composite members. 10 CO2 [K₃]
