

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -I EXAMINATION- 2024

M.Tech.- II Semester (CE-CM)

COURSE CODE(CREDITS): 10M11CE215 (3)

MAX. MARKS: 15

COURSE NAME: Sustainable Design and Construction

COURSE INSTRUCTORS: Saurabh Rawat

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

- Q1)** Explain the term 'Ecological Footprint'. Calculate the 'Ecological Footprint for India' for fisheries using the data given below.

Area Type	Equivalent Factor	Yield factor for India	Annual Consumption (MMT)
Marine	0.36	0.2	1.5
Inland water	0.36		0.2

Enlist the '4 threads' for minimizing the effects of 'Techno process' on bio – mimicry.

COI [1+2+1 = 4]

- Q2)** Define 'Planet Equivalent'. For the following data, calculate the 'Bio -- capacity' and 'Planet Equivalent'. The population of the World till February 2024 is 8.1 billion.

COI [1+2 = 3]

Area Type	Area (Billion Hectares)
Crop land	1.5
Grazing land	3.4
Forest land	3.7
Built-up land	1.2
Marine	1.2
Inland water	1.2

- Q3)** Using the stoichiometry of cement production, explain the contribution of relative emissions from cement in the Green House Gases contribution.

CO₂, CO₃ [3]

- Q4)** Explain the term 'chemical exergy'. How does the chemical exergy change during cement production by using 35% fly ash?

CO₂, CO₃ [1+ 2 = 3]

- Q5)** Using the stoichiometry behind cement production, discuss 'Carbon Sequestration'.

CO₂, CO₃ [2]