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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E.

Semester: V

Branch: Civil Engineering

Duration: 3 hrs.

Course Code: 20CV5PEABM

Max Marks: 100

Course: Alternative Building Materials and Technologies

Date: 03.03.2023

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1 a) For the following materials discuss the concept of sustainability using the Venn diagram 10
 i. Size stone
 ii. Lime pozzolana cement
 iii. Precast concrete elements
 iv. Structural steel members

b) A store room needs to be constructed of the following dimensions 8m x12m with a ceiling height of 4.5m. It has a single door of dimension 1.5x2.5m. The contractor has given the following options for wall and roof systems.
 Select the best combination of wall and roof system that can be considered based on their cumulative embodied energy. Also discuss the merits and demerits of the selected structural system.

Use the following data:

Options for wall (thickness)	EE (MJ/m ³)	Options for roof	EE (MJ/m ²)
CSEB wall (240mm)	631	RC Slab	690
Solid Concrete wall (150 mm)	1997	SMB filler Slab	590
Wire-cut brick wall (220 mm)	2604	CSEB vault roof	300

UNIT - II

2 a) Compare the engineering properties for the masonry units 08
 i. Laterite blocks
 ii. FalG blocks
 iii. Hollow Clay blocks

b) With a flow chart discuss the production of stabilised mud blocks. Discuss the requirements to be satisfied by these blocks to be used as structural units. 12

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - III

3 a) List and discuss the agro wastes that can be incorporated in building construction as materials and components without compromising the requirements. Justify their applications. **10**

b) Utilisation of C&D waste is the need of the hour. **10**
Justify the statement and options available for their utilisation.

OR

4 a) List and discuss the various industrial by products which can be utilised as a replacement to natural aggregates. **10**

b) Compare lime-pozzolana cement and ordinary portland cement with respect to different criteria. **10**

UNIT - IV

5 a) Prepare the list of materials and their specification for the construction of ferro-concrete water tank. Provide a cross section of the ferro-concrete element. **10**

b) Justify that the performance of fibre reinforced concrete is superior to that of conventional concrete. **10**

UNIT - V

6 a) Discuss any two alternate roofing options based on masonry units. **10**

b) Mention some typical filler materials that can be used in a filler slab construction. Draw a typical cross-section of filler slab and discuss the mechanism. **10**

OR

7 a) Discuss any two alternate roofing options based on precast members **10**

b) With diagrams, explain how lateral thrust can be handled in domes and vaults. **10**
