



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Civil Engineering

Semester End Examination; July / Aug. - 2022

Alternative Building Materials and Masonry Structures

Time: 3 hrs

Max. Marks: 100

Course Outcomes

The Students will be able to:

CO1: Understand significance of Energy in building materials, Environmental issues concerned to building materials, Global warming and construction industry.

CO2: Understand the characteristics of building blocks for walls, Stones and Laterite blocks, Bricks and hollow clay blocks.

CO3: Study the possible causes of defects in masonry, factors affecting strength of masonry, and permissible stresses in masonry.

CO4: Design masonry buildings up to three floors, design of walls subject to both axial and eccentric load as per IS relevant codes.

Note: I) PART - A is compulsory. Two marks for each question.

II) PART - B: Answer any Two sub questions (from a, b, c) for a Maximum of 18 marks from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
I : PART - A		10			
I a.	List the different categories of energy consumption in a building.	2	L1	CO1	1,7
b.	Define cavity wall.	2	L1	CO2	1,7
c.	Define Rat-Trap bond.	2	L1	CO3	2,4,7,12
d.	Give example of alternative building materials used in construction.	2	L1	CO3	2,4,7,12
e.	Define a lintel.	2	L1	CO4	1,2,3
II : PART - B		90			
UNIT - I		18			
1 a.	Discuss the environmental issues related to building materials. Explain how to mitigate these environmental problems.	9	L6	CO1	1,7
b.	Calculate the embodied energy in 1 m ³ of M25 grade of concrete.	9	L2	CO1	1,7
c.	Explain the environmental friendly and cost effective building technologies.	9	L2	CO2	1,7
UNIT - II		18			
2 a.	List out the various Industrial waste. Explain its merits and demerits with examples.	9	L2	CO2	1,7
b.	Explain in detail manufacturing process of concrete blocks.	9	L2	CO2	1,7
c.	Explain the material required for production of fiber reinforced cement composite and its role.	9	L2	CO2	1,7

UNIT - III**18**

- 3 a. List the different types of mortar used in construction and explain it briefly. 9 L2 CO3 2,4,7,12
- b. List the materials used in Ferro cement. Explain its construction methods in brief. 9 L2 CO3 2,4,7,12
- c. Explain the construction procedure of Filler slab roof with sketch. 9 L2 CO3 2,4,7,12

UNIT - IV**18**

- 4 a. Write a short note on;
- i) Joints in walls 9 L1 CO4 1,2,3
- ii) Effects of curing in buildings
- b. The brick masonry prism is made up of 5 bricks joined by a mortar of thickness 2 cm. The brick is 7.5 cm in thickness. The prism is subjected to uniform vertical stress of 4 MPa. The brick has a modulus of 500 MPa and the mortar has a modulus of 800 MPa. Determine the horizontal lateral stress in brick and mortar. Assume the Poison's ratio of brick and mortar is 0.1. 9 L6 CO4 1,2,3
- c. List the factors influencing of compressive strength of masonry. Explain any two factors. 9 L2 CO4 1,2,3

UNIT - V**18**

- 5 a. Explain with the help of a sketch a casting of curved shape panel and beam. 9 L2 CO4 1,2,3
- b. Design an interior cross wall of a 2 storeyed building to carry 100 mm thick RCC slab with 3 m ceiling height. The wall is unstiffened and its supports 2.65 m wide slab. Take live load on roof 1.5 kN/m², Live Load on floor = 2 kN/m², Weight of 80 mm thick wpc in terrace = 1.96 kN/m² and weight of floor finish = 0.8 kN/m². 9 L6 CO4 1,2,3
- c. Write a short note on;
- i) Application of free standing wall 9 L2 CO4 1,2,3
- ii) Slenderness ratio
- iii) Prefabricated technique

* * * *