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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.

<u>*Note:*</u> *I) PART - A is compulsory. **Two** marks for each question.*
  *II) PART - B: Answer any <u>**Two**</u> 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 m³ 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 ii) Effects of curing in buildings	9	L1	CO4	1,2,3
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/m^2, Live Load on floor = 2 kN/m^2, Weight of 80 mm thick wpc in terrace = 1.96 kN/m^2 and weight of floor finish = 0.8 kN/m^2.	9	L6	CO4	1,2,3
c.	Write a short note on; i) Application of free standing wall ii) Slenderness ratio iii) Prefabricated technique	9	L2	CO4	1,2,3

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