| U.S.N. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

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

**Autonomous Institute Affiliated to VTU**

## September / October 2023 Supplementary Examinations

**Programme: B.E.** **Semester: VI**
**Branch: Civil Engineering** **Duration: 3 hrs.**
**Course Code: 20CV6PESMA** **Max Marks: 100**
**Course: Structural Masonry**

**Instructions**: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.
3. Use of **IS: 1905-1987** is permitted
4. Use illustrative sketch when necessary to substantiate the answers





### UNIT - I

| | | | |
|---|---|---|---|
| 1 | a) | Describe clay brick, concrete block and soil cement block with regard to their strength resistant to atmospheric agents and modulus. | **10** |
| | b) | Describe straight cement sand mortar and composite mortar with reference to their properties. State their advantages and disadvantages. | **10** |

### UNIT - II

| | | | |
|---|---|---|---|
| 2 | a) | Describe the failure of masonry subjected to compression, dynamic load and lateral thrust. How can each be avoided? | **10** |
| | b) | Explain the factors which influence the compressive strength of masonry. | **06** |
| | c) | Describe platen effect in the compression test of masonry block. | **04** |

### UNIT - III

| | | | |
|---|---|---|---|
| 3 | a) | Explain briefly the laboratory procedure to obtain the brick mortar bond strength with an illustrative sketch. Evaluate the bond strength of a triplet test assuming a failure load of 3kN and the brick mortar contact area to be 90mm x 180 mm. | **10** |
| | b) | Explain the behavior of masonry under compression with a neat sketch. | **06** |
| | c) | Explain the effect of thickness of block and thickness of mortar on the strength of masonry. | **04** |

### UNIT - IV

| | | | |
|---|---|---|---|
| 4 | a) | Describe the necessity of providing reinforcement to masonry. Illustrate three types of providing reinforcement in masonry. | **10** |
| | b) | Describe with a neat sketch, the nature of stresses developed in a masonry dome. Describe the collapse of a masonry dome. | **06** |
| | c) | Describe the load transfer phenomenon in a masonry arch. | **04** |

## UNIT - V

| | | | |
|---|---|---|---|
| 5 | a) | Explain the importance of slenderness ratio, area modification factor and basic compressive strength in the design of masonry. | **06** |
| | b) | Design a long wall of a room of internal dimensions 6m x 4m. The longer wall has a cantilever slab extension of 1.5m. Consider 3m clear height between floors and 4 storeys. Assume density of masonry = 20 kN/$m^3$ and that that of RCC = 25 kN/$m^3$. Thickness of RCC slab = 125mm, live load and floor finish for all floors = 2 kN/$m^2$ and 1 kN/$m^2$. | **14** |

**OR**

| | | | |
|---|---|---|---|
| 6 | a) | Explain the governing design criteria for a eccentrically loaded masonry wall. What steps should be adopted to avoid failure. | **06** |
| | b) | Design a free standing wall of length and height 4m each with a thickness of 230mm. It is provided with cross walls of thickness 230mm and width 460mm. Assume wind speed = 33 m/s and constants K1, K2 and K3 = 1 and density of masonry = 20 kN/$m^3$. | **14** |

******