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Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 00131 Roll No.

# B. Arch. Examination 2021-22

## (Even Semester)

## ARCHITECTURAL STRUCTURES - VI

*Time : Three Hours]* *[Maximum Marks : 60*

**Note :–** (i) Attempt any five questions.

(ii) Use of IS : 456 : 2000 is allowed.

(iii) Use of scientific calculator is allowed.

(iv) Assume missing data if any suitably.

(v) All questions carry equal marks.

1. Design a continuous RCC beam of rectangular cross-section to support a dead load of 8 kN/m and working load of 12 kN/m over three simply supported span of 8 m each. Use M 20 grade of concrete and Fe 415 grade of steel.

*[P. T. O.*

2. What are folded plates? Explain their structural behaviour. Give their field application. 7

3. A cantilever retaining wall is designed to retain the earth 3.1 m high behind the wall. Fix the dimension of retaining wall and carryout all the stability checks. The unit weight of soil is 17 $kN/m^3$ and angle of internal friction is $35^0$. The bearing capacity of soil is 195 $kN/m^2$ and coefficient of friction between base and soil is 0.46. Use M 25 grade of concrete and Fe 415 grade of steel.

4. What are the types of shell structures? Explain the advantages of shell roofs over conventional roofs.

5. What are the purpose of providing expansion joints in the building? Explain in detail.

6. Design a one bay single storey portal frame to support 120 mm slab. The slab carries a live load of 3.5 $kN/m^2$ and floor finish of 1 $kN/m^2$. The portals are spaced at 4m. The bay width is 12 m and height of columns ground is 4 m. Take safe bearing capacity of soil = 200 $kN/m^2$. Consider fixed bases.

7. What are construction joints? Describe the methods of installation of construction joints in a RCC roof slab.

8. Design a dog-logged stairs for an office building in a room measuring 2.8 m × 5.8 m. Foor to floor height is 3.6 m. Take width of flight and landing as 1.25 m. Take rise as 150 mm and tread as 250 mm. Live load on stairs is 3 $kN/m^2$. Use M 20 grade of concrete and Fe 415 grade of steel. Sketch the reinforcement details.

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