

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
M.Tech. Summer 2017 - 18 Examination

Semester: 2
Subject Code: 03209182
Subject Name: Design of Disaster Resistant Structures

Date: 28/05/2018
Time: 2.00 pm to 4.30 pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.
5. IS 1893 (Part-I) : 2016, IS 13920:2016 are allowed

Q.1 A Four Storey RCC Building having Lumped Mass $M_1=3000$, $M_2=3000$, $M_3=3000$, $M_4=2500$ is located at Roorkee. The height of Building is 3 m and total height of the Building is 12 m. The dead load and Live load is Lumped at Respective floor. The soil below foundation is assumed to be hard rock. Assume that building is to be intended to be used as a hospital. Determine the total Base Shear as per IS 1893 (Part I): 2016. **(15)**

Q.2 Answer the following questions. (Attempt any three) (Each five mark) **(15)**

- A) Explain Code-based Procedure for Seismic Design.
- B) Explain Design Spectrum In Detail.
- C) Explain Code-based Procedure for Seismic Analysis.
- D) Enlist and Explain the Principal Causes of Damage to the Building due to Earthquake.

Q.3 A) Write a Short Note on Response Spectra. **(07)**
 B) Describe in Short: Capacity/Demand Method, Push Over Analysis. **(08)**

OR

B) A four storey RC Building is to be analyzed by equivalent static method as per IS 1893 (Part I): 2016 for the following data: **(08)**

- Type of structure- SMRF
- Seismic Zone- IV
- Floor Height- 3.1 m
- Infill Wall- 250 mm thick in longitudinal and 150 mm thick in transverse direction
- Imposed load- 3.0 kN/m^2
- Materials- Concrete M_{20} , Steel Fe_{415}
- Size of Column- 300 x 450 mm
- Size of Beam- 300 x 400 mm in longitudinal and 250 x 350 mm thick in transverse direction
- Depth of Slab- 125 mm
- Specific Weight of RCC- 25 kN/m^3
- Specific Weight of infill- 20 kN/m^3
- Type of Soil- Rock

Assume Suitable data if Necessary.

Q.4 A) Sketch the ductile detailing requirements of column as per IS 13920: 2016 **(07)**

OR

- A) Explain the impact of Ductility in earthquake resistant design. **(07)**
- B) Sketch the ductile detailing requirements of beam as per IS 13920: 2016 **(08)**