

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**M.Tech. Winter 2019 - 20 Examination**

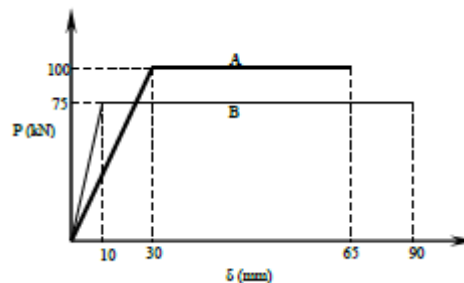
**Semester: 2**  
**Subject Code: 03209182**  
**Subject Name: Design of Disaster Resistant Structure**

**Date: 20/12/2019**  
**Time: 02:00pm to 04:30 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. Permit use of IS-1893 and IS-13920

- Q.1** A) Explain four virtues of earthquake resistant design. (05)  
 B) Explain effects of flood, wind and fire disasters to structures according to codal provisions. (05)  
 C) Enlist and Explain major changes in IS-1893:2016 in comparison with older revision. (05)
- Q.2 Answer the following questions.** (Attempt any three) (Each five mark) (15)  
 A) Explain about blast resistant design and Effect of blast above ground and below ground structures.  
 B) Differentiate the following terms  
 1. Storey drift and storey shear  
 2. Soft storey and weak storey  
 3. Importance factor and response reduction factor  
 C) Explain shear wall frame interactions  
 D) Explain the effect of building configuration on seismic response in brief.
- Q.3** A) Enlist various structural systems used in tall buildings and explain any two in brief. (07)  
 B) Force deformation curve of two building is shown in **Fig.1**, calculate (i) Stiffness of building A and B (ii) Ductility factor of building A and B (iii) Energy absorption capacity of building A and B (iv) Maximum load capacity of building A.



**Fig.1**  
**OR**

- B) Write short note on response spectrum. (08)
- Q.4** A) Explain in brief base isolation technique. (07)  
**OR**  
 A) Describe concept of ductile detailing & explain factors affecting the ductility of structures in detail. Also explain ductile detailing of beam – column joint as per IS 13920 – 1993. (07)  
 B) Calculate base shear in for five storey school building in Ahmedabad with following data by seismic coefficient method.

(a) No. of bay in x direction = 3	(b) No. of bay in y direction = 4
(c) Storey height = 3.0 m	(d) Width of each bay = 4 m
(e) Total DL on roof = 12 kN/m <sup>2</sup>	(f) Total DL on floor = 15 kN/m <sup>2</sup>
(g) LL = 5 kN/m <sup>2</sup>	(h) Damping = 7%

(08)

Neglect weight of infill walls. Assume suitable data if required. Write all the clauses of IS 1893-(2002).