

C.U.SHAH UNIVERSITY

Winter Examination-2015

Subject Name: Geology and Earthquake Engineering

Subject Code :4TE06GEE1

Branch: B.Tech(Civil)

Semester: 6

Date: 11/05/2016

Time: 02:30 To 05:30

Marks:70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.
- (5) IS:13920-1993 And IS 1893 (Part-1) are allowed.

Q-1 Attempt the following questions: (14)

- | | | |
|----|---|---|
| a) | Which is the slowest seismic wave? | 1 |
| b) | According to IS: 1893 (Part-I)-2002, the ratio (I/R) shall not be greater than _____ | 1 |
| c) | S-wave can travel through liquid only. It's true or fall? | 1 |
| d) | Write the equation of dynamic equilibrium. | 1 |
| e) | As per IS: 4326-1993 the crushing strength of masonry unit should not be less than _____ | 1 |
| f) | As per IS: 1893-2002 earthquake is not likely to occur simultaneously with wind. Is true or fall? | 1 |
| g) | A building is located on the boundary of zone IV & V so building will be designed in zone IV & V? | 1 |
| h) | R.C frame building is more ductile as compared to Steel Frame Building. Is true or fall? | 1 |
| i) | Define resonance. | 1 |
| j) | Define oscillation | 1 |
| k) | Define homoseismal line. | 1 |
| l) | Define focal region | 1 |
| m) | Define Weathering | 1 |
| n) | Define Flexure wall. | 1 |

Attempt any four questions from Q-2 to Q-8

Q-2 (14)

Plan of five story building shown in Figure-1 dead load including self-weight of slab, finishes, etc. can be assumed as 3 kN/m^2 and live load as 4 kN/m^2 on each floor and 1.5 kN/m^2 on the roof. Weight of partitions is 2 kN/m^2 . Determine the lateral forces and shears at different story levels. Story height 3.5 m, soil type = 2.

14



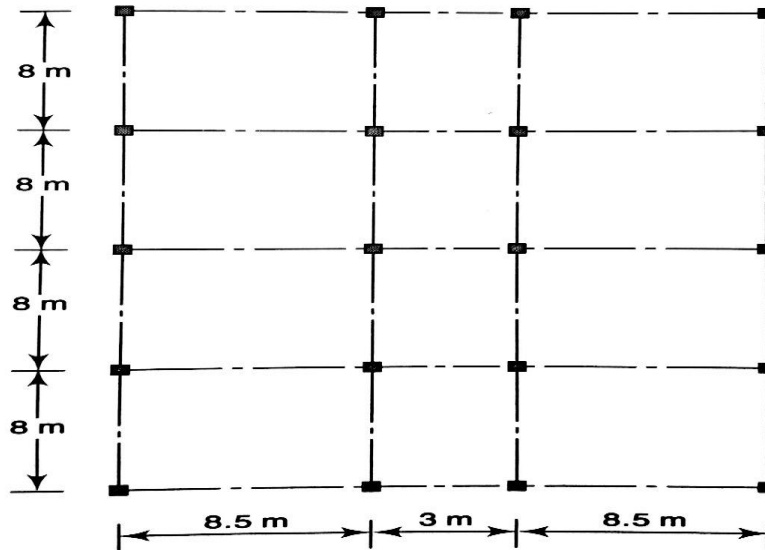


Figure-1

- Q-3** **Attempt all questions** (14)
- a) Derive the motion equation for the damped forced vibration. 8
- b) Explain: Igneous, sedimentary and metamorphic rocks. 6
- Q-4** **Attempt all questions** (14)
- a) Draw neat sketch of seismograph and enlist the component. 5
- b) Explain Formation and classification of rocks. 5
- c) Write brief note on conglomerate. 4
- Q-5** **Attempt all questions** (14)
- a) Explain in Detail “Failure Mechanisms of masonry building “. 10
- b) Write short note on pounding effect on building. 4
- Q-6** **Attempt all questions** (14)
- (a) Explain DVA Curve. 7
- (b) What is base isolation? Explain concept of base isolation. Discuss various seismic isolators. 7
- Q-7** **Attempt all questions** (14)
- (a) A spring mass model consist of 5 kg mass and spring with stiffness 3.5 N/mm, was tested for various damped vibration. Test recorded two successive amplitude s 1.5 and 1.25. determine:
- (1) The natural frequency of undammed system
- (2) The logarithmic decrement



- (3) Damping ratio
- (4) Damping coefficient
- (5) Damping natural period.

(b) Explain the ductile detailing of a beam as per IS 13920-1993. 7

Q-8 **Attempt all questions** **(14)**

(a) Give the Classification of weathering. Explain physical weathering in details. 7

(b) Explain philosophy of earthquake resistant design. 7

