

H.T No:

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**R18**

Course Code: B30422



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

**M.Tech III Semester Regular & Supplementary Examinations Feb/March-2023**

**Course Name: EARTHQUAKE RESISTANCE DESIGN OF BUILDINGS**

**(Structural Engineering)**

Date: 27.02.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks.

5x4=20M

1. At a recording station a difference in time of arrival between P waves and S waves was observed to be 1.5 seconds. What is the approximate distance from the station at which the event occurred? Assume P wave velocity as 4 km/sec and S wave velocity as 2 km/sec. 4M
2. "If a building is to be constructed on the slope of a hilly area", what precautions needs to be exercised during planning of the building to avoid twisting? 4M
3. Write a short note on: 4M
  - i) Box action of walls
  - ii) Strengthening of Masonry buildings
4. Why is it important to take suitable measures for prevention of non – structural failure rather than to undertake repairs after damage? 4M
5. What are the factors affecting the ductility in earthquake resistant design of RC buildings? 4M

**PART-B**

Answer the following. Each question carries TEN Marks.

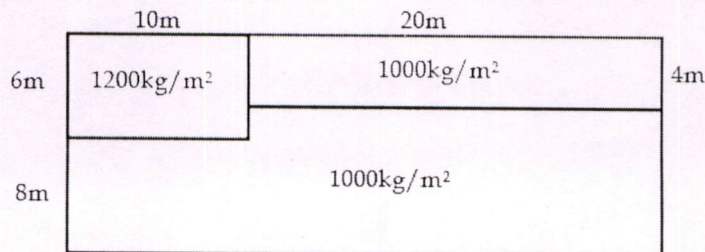
5x10=50M

6. A). Elucidate various seismic zones of India? Distinguish between a seismometer and an accelerometer. 10M

**OR**

6. B). During an earthquake the maximum amplitude recorded at a site by Wood- Anderson Seismograph is 20 cm. The maximum ground velocity recorded was 25 cm/sec. The site was found to be 75 km away from the epicenter. Determine the Magnitude and Intensity of the occurred earthquake. 10M

7. A). For the building shown in figure below, locate the center of mass from bottom left corner of building. The building has non-uniform distribution of mass as shown. 10M



**OR**

7. B). "Simplicity and symmetry is the key to making a building earthquake resistant", 10M  
explicate the concept with the help of instances.

(P.T.O..)

8. A). What are the possible damages to RCC Buildings in Earthquake – Prone regions? 10M

**OR**

8. B). Discuss briefly the practical cases of the following: 10M  
i) Vertical Irregularities  
ii) Plan configuration Problems.

9. A). Discuss the behavior of the following masonry walls in seismic regions. 10M  
i) Unreinforced masonry walls  
ii) Reinforced masonry walls  
iii) Infill Walls

**OR**

9. B). Explain briefly the Importance of non-structural members in a building and failure mechanisms of non-structures. 10M

10. A). Elucidate the design considerations in Capacity based design with a case study. 10M

**OR**

10. B). Enlighten the effect of vulnerability of open ground storey and short columns during earthquakes. 10M

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H.T No:

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**R18**

Course Code: B30331



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

M.Tech III Semester Regular & Supplementary Examinations Feb/March-2023

Course Name: **RENEWABLE ENERGY SOURCES**

(Structural Engineering)

Date: 01.03.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks.

5x4=20M

1. Write notes on Photo-Voltaic Energy Conversion. 4M
2. Explain Betz Criteria. 4M
3. Explain the types of Bio-Gas Digesters. 4M
4. What are the guidelines to setting of OTEC plants? 4M
5. Explain the merits and demerits of DEC. 4M

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

6. A). Explain the instruments for measuring the solar radiation and sunshine. 10M
- OR**
6. B). Explain the various applications of Solar energy in detail. 10M
7. A). Explain in detail the sources and potentials of Wind Energy. 10M
- OR**
7. B). Write notes on Performance characteristics of wind energy. 10M
8. A). Explain the combustion characteristics of bio-gas. 10M
- OR**
8. B). Explain the Anaerobic and Aerobic digestion process Bio-mass. 10M
9. A). Explain the potential and conversion techniques of Ocean Energy. 10M
- OR**
9. B). Write notes on mini hydel Power Plants in detail. 10M
10. A). Write notes on Carnot cycle and its limitations. 10M
- OR**
10. B). Explain the working principle of DEC in detail. 10M

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