

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2082 Chaitra

Exam.	Regular (New Course)		
Level	BE	Full Marks	60
Programme	BCE	Pass Marks	24
Year / Part	III / I	Time	3 hrs.

Subject: - Design of Timber and Masonry Structures (ENCE 301)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.
- ✓ IS 883:2016 and IS 1905:1987 are allowed to use.



1. a) Explain the factors affecting the strength of structural timber. [2]
b) Differentiate between cross laminated timber and glued laminated timber. [2]
2. a) Explain behavior of bolted joints in timber structures. [3]
b) Describe different types of structural timber joints. [3]
3. a) Design a Sal wood beam having a clear span of 4m carrying a load of 20 kN/m including the self-weight of the beam. [5]
b) Design a Sal wood rectangular column having height 3 m and subjected to axial compressive load of 250 kN and bending moment 50 kNm. Both ends of the column are fixed. [5]
4. Explain various types of masonry bonds with neat sketches. [4]
5. a) Design a wall of two-story building to carry 150 mm thick RCC slab with 3.3 m ceiling height. The wall is unstiffened and support a 2.5m wide RCC slab on both sides. Take: live load on roof = 1.5 kN/m², live load on floor = 2 kN/m² and Floor finishes = 1 kN/m². [6]
b) Explain the procedure to design a masonry wall with eccentricity. [6]
6. a) Describe in-plane and out of plane behavior of masonry wall under lateral loads. [4]
b) List out the lateral load resisting elements in masonry structures. Describe the horizontal bands in masonry walls with a neat sketch. [2+2]
7. a) Explain the design principles of earthquake resistant masonry constructions. [6]
b) Describe strengthening measures of masonry structures to sustain earthquake effects. [4]
8. a) Explain importance of testing masonry elements. [2]
b) Explain about diagonal shear test. [4]
