

NEB-GRADE XII  
**Structural Analysis and RCC Design**  
 Model Question [2077 (2020)]

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Time: 1.30 hrs.

Full Marks: 30

**Group 'A'**  
 (Very short answer questions)

Attempt any **two** questions.

2x2.5=5

1. What are various components of structural systems?
2. Sketch different types of arches.
3. Define Hooke's law and poisson's ratio.

**Group 'B'**  
 (Short answer questions)

Attempt any **three** questions.

3x5=15

4. Differentiate between one-way and two-way slabs. Also sketch the detailing of reinforcements in RC Column.
5. What are the different methods of analysis of truss? Describe the determinacy and indeterminacy of trusses.
6. Write two equations of static equilibrium. Also explain their physical meaning.
7. Define (a) stress (b) strain (c) poisson's ratio (d) flexure (e) torsion.

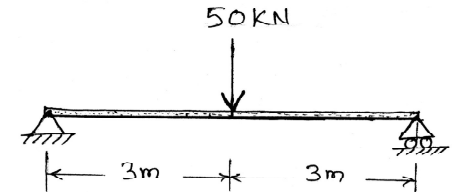
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**Group 'C'**  
 (Long answer questions)

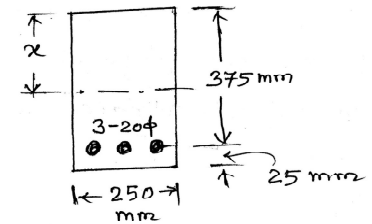
Attempt any **one** question.

1x10=10

8. Determine the reactions, and draw Shear force and bending moment diagrams for the beam loaded as shown in the figure below. Show all the steps.



9. Determine the depth of Neutral axis ( $x$ ) and moment of resistance of the beam shown in the figure below:  
 Adopt  $\sigma_{cbc} = 7 \text{ N/mm}^2$  and  $\sigma_{st} = 230 \text{ N/mm}^2$ .



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