

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B.ARCH. - SEMESTER-II EXAMINATION – WINTER 2015**

**Subject Code: 1025004**

**Date: 19/12/2015**

**Subject Name: Structure - II**

**Time: 02:30pm to 04:30pm**

**Total Marks: 50**

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

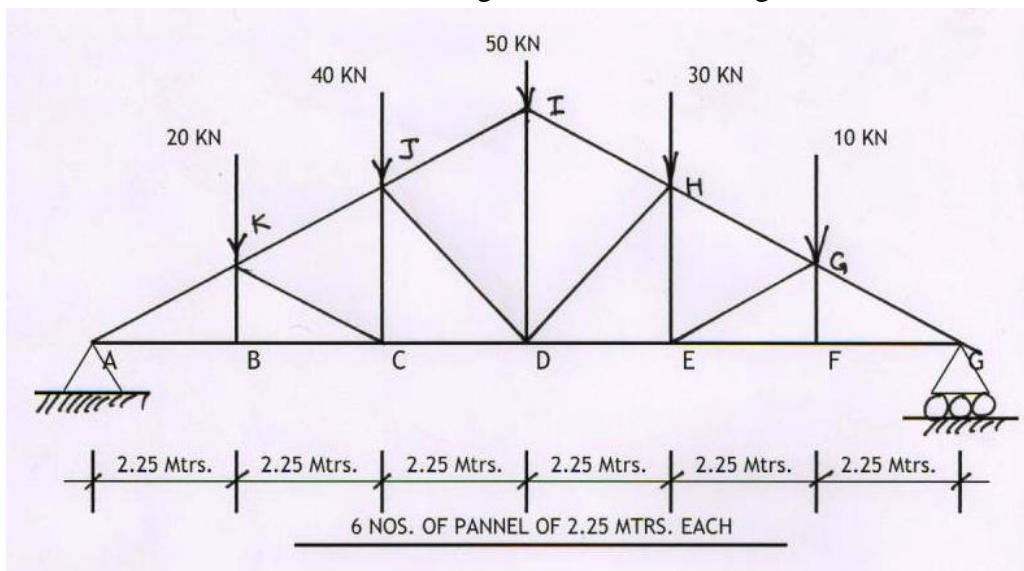
- Q.1 (a)** Define the following Terms (any One) **03**
1. Stress & Strain [Write SI unit & Equation of the Same]
  2. Tensile Stress & Compressive Stress
- (b)** State the Hook's Law and Explain it in brief **03**

**OR**

Give the Sign Convention for Tension Member and Compression Member in analyses of TRUSS with the help of the Neat sketch

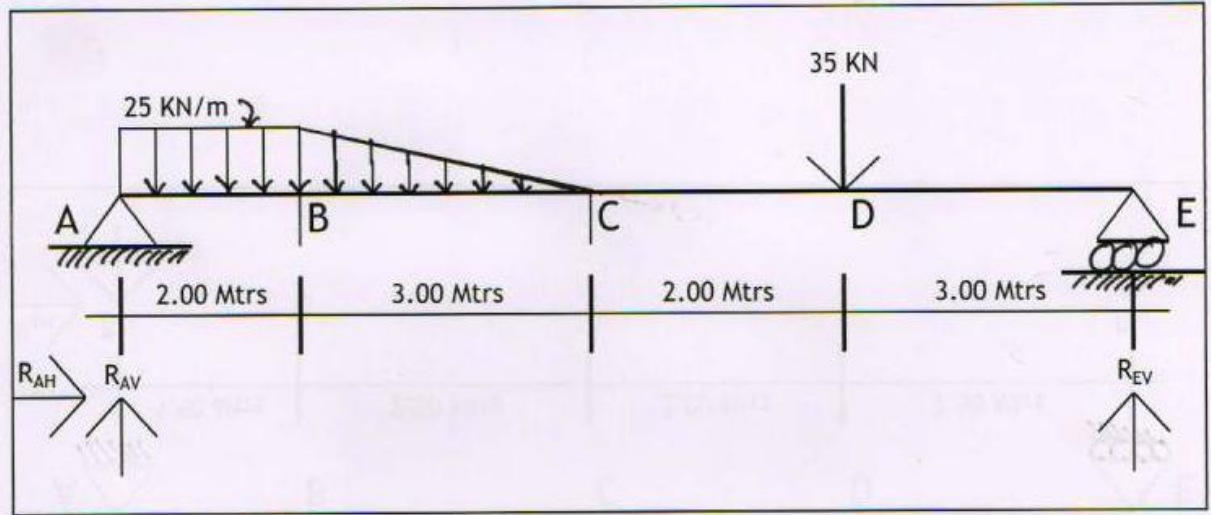
- (c)** Define the following Terms (any Two) **04**
- 1) Bending Moments and Shear Force in Beam
  - 2) Differentiate between the TRUSS and FRAME
  - 3) Define the Terms Uniformly Distributed Load and Uniformly Varying Load with the help of sketches

- Q.2 (a)** Describe the following Terms (any Two – With the help of sketches) **04**
- I. Enlist the Basic Assumptions for Analyses of Truss
  - II. Enlist of the various Types of Truss as per Stability [with the help of the equation]
  - III. Enlist the Types of the END Support [with the help of Sketches]
- (b)** Find the End Reaction for the below given sketch / Drawing of TRUSS **06**



- Q.3 (a)** Describe the following Terms (any Two – With the help of sketches) **04**
1. Enlist the Types of BEAMS [with the help of Sketches]
  2. Enlist the Types of the LOADS [with the help of the sketches]
  3. Explain ‘‘ Equilibrium Conditions ‘‘ in BEAM
  4. Differentiate between cantilever Beam and Over hanging Beam with the help of sketch

- (b)** Find the Support Reactions for the Given below sketch OR drawing of the BEAM **06**



- Q.4 (a)** Explain the following Terms (any Two – With the help of sketches) **04**
1. Define the Terms Statically Determinate Beam and Statically Indeterminate Beam
  2. Enlist the Examples of Statically Determinate Beam and Statically Indeterminate Beam
  3. Differentiate between Perfect TRUSS and Imperfect TRUSS
  4. Define the Terms – Modules of Elasticity

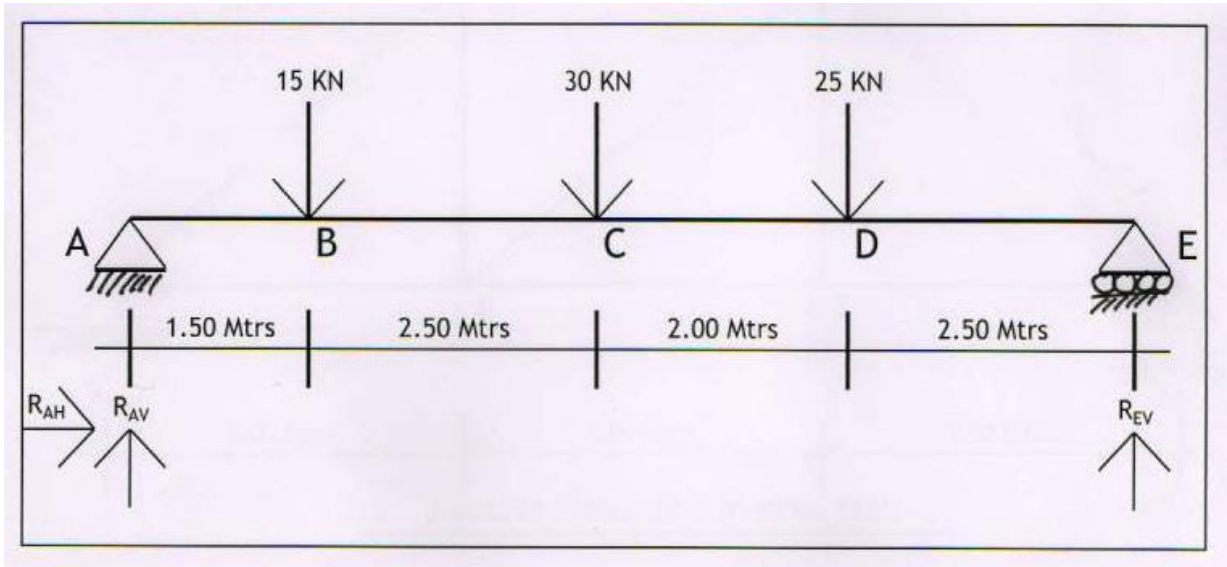
- (b)** A Steel Rod having 3.10 Mtrs. Length and 25 mm in diameter is subjected to an axial pull of 130 KN Under axial pull the steel wire elongates by 6 mm. **06**  
 Find the STRESS [ $p$ ],  
 STRAIN [ $e$ ], and  
 Modules of Elasticity [ $E$ ] of the same material.

**OR**

- (b)** Explain the following Terms (any Two – With the help of sketches if required) **06**
1. Enlist the External forces on the TRUSS
  2. Enlist the Uses of the TRUSS
  3. Give the Sign Conventions for Shear Force Diagram and Bending Moment Diagram
  4. Draw the typical diagram of Stress – Strain behavior of Mild Steel

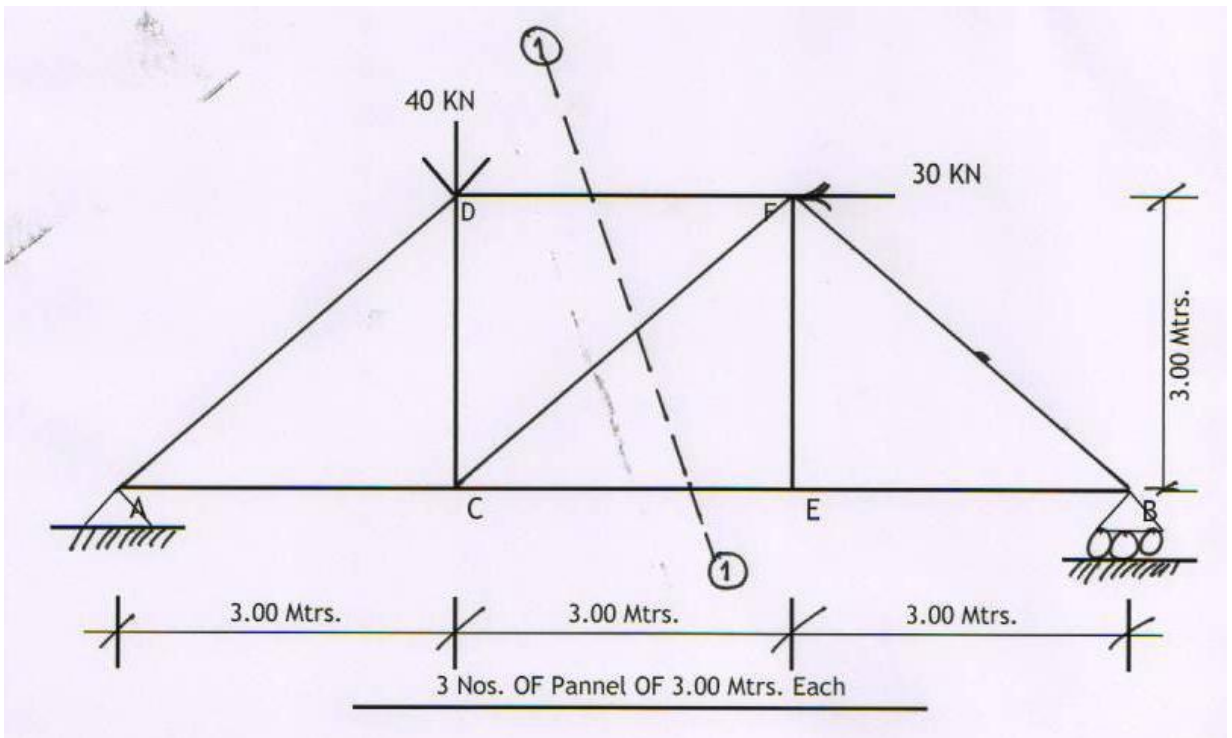
- Q.5 (a)** A simply supported Beam ABCDE with at ‘A’ Hinge support and at ‘E’ Roller support is **10**

subjected to loads as in FIGURE NO. 04. Calculate the END Reactions at A and E and the Value of Shear Force and Bending Moments at all Important Points and Draw Free Body Diagram [FBD], Shear Force Diagram [SFD] and Bending Moment diagram [BMD]



OR

**Q.5 (a)** Find the support reactions at the end A and B and Calculate the forces in the marked members of the TRUSS shown as below figure {Marked Members are Member CD, DF & CF} and Draw the Free Body Diagram [FBD] **10**



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