Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester: IV Civil Engineering

Regular Examination April – June 2016

2CI401 STRUCTURAL ANALYSIS - I

Time: 3 Hours   Total Marks: 60
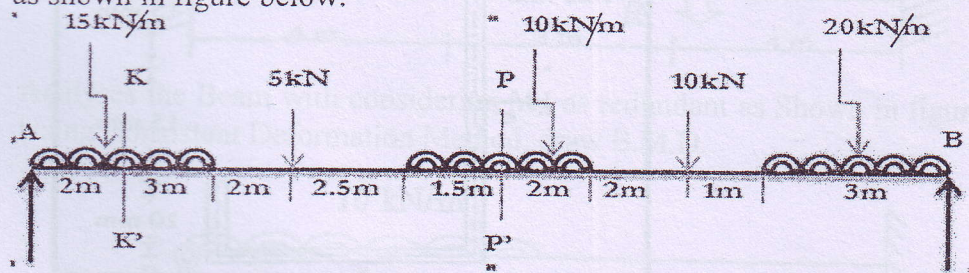
Instruction: 1. All questions are compulsory.
                     2. Figure indicates right full marks.
                     3. Assume suitable data if required.

Section - I

Que. 1   Attempt following question

(A)   Find the shear force at the section K-K' and P-P' separately for the loaded girder   05
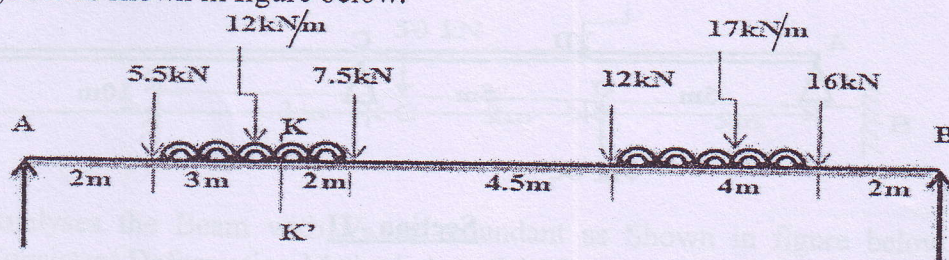as shown in figure below.

(B)   Explain the assumptions considered for space truss with neat sketches.   05
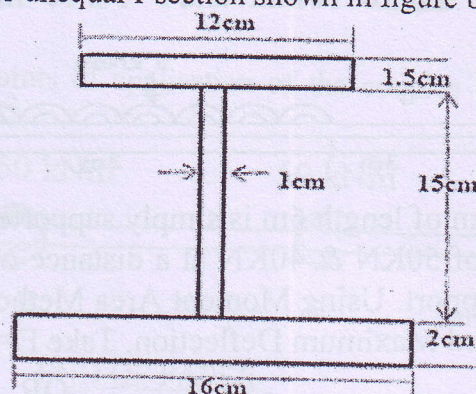
OR

Que. 1   Attempt following question

(A)   Find the positive and negative shear force at the section K-K' for the loaded   05
girder as shown in figure below.

(B)   Explain the members of space truss and advantages of spaces truss.   05

Que. 2   Attempt following question

(A)   Find the shear center for unequal I-section shown in figure below   05

(B) A symmetric three hinge parabolic arch has a span of 50 m and a central rise of 5 m. The arch carries a distributed load of 45 kN/m from left side to mid span and 20kN point load acting 30m from left side. Determine
    i.   Reactions and respective angle
    ii.   The horizontal thrust at the abutments.
    iii.   Maximum positive and negative bending moment in the arch.

OR

Que. 2   Attempt following question

(A)   Determine the shear center for folded 'C' channel type thin walled section as shown in figure below.   **05**
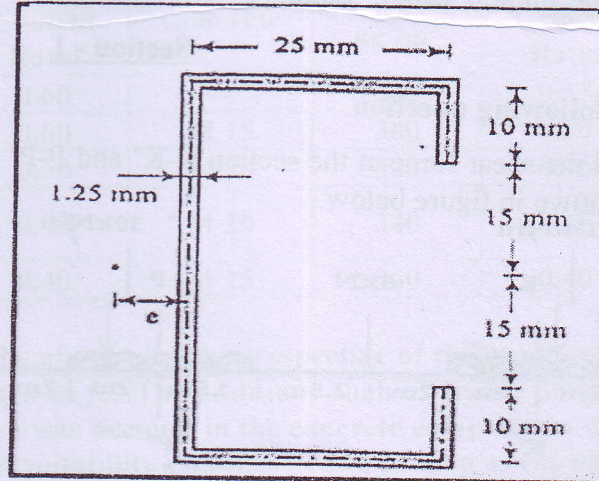
(B)   Based on property of circle, differentiate types of three hinged arch and derive its equation.   **05**

Que. 3   **Draw the influence lines for reactions at supports A,B,C and bending moment at support B for the beam shown in figure. Find the maximum values when a travelling load of 65 kN per meter may cover any part of span.   **10
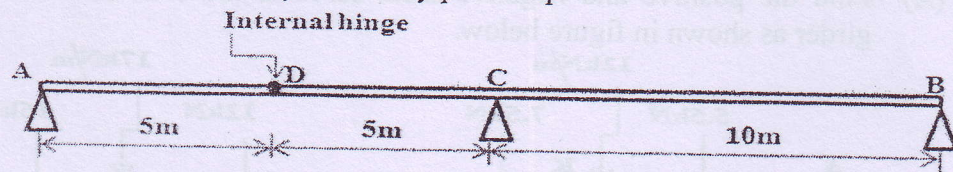
Section - II

Que. 4   Attempt following question

(A)   Determine slope and deflection at any point C as shown in figure below. Use Macaulay's method.   **05**
Take $E = 2 \times 10^5$ N/mm^2 and $I = 5 \times 10^8$ mm^4
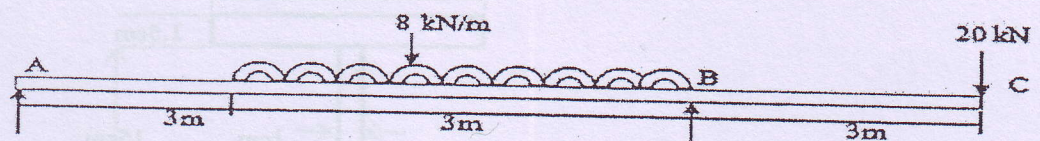
(B)   A Beam of length 6m is simply supported at its ends and carries two point loads of 50KN & 40KN at a distance of 1m & 3m respectively from the left support. Using Moment Area Method, find out Deflection under each load and Maximum Deflection. Take $E = 2 \times 10^5$ Mpa $I = 85 \times 10^6$ mm^4 **05**

OR

Que. 4   **Attempt following question**

(A)   Find out Slope and Deflection at free end using Conjugate Beam method.   **05**
Modulus of Elasticity is 2×10^5 N/mm^2 and Inertia is 3×10^8 mm^4.
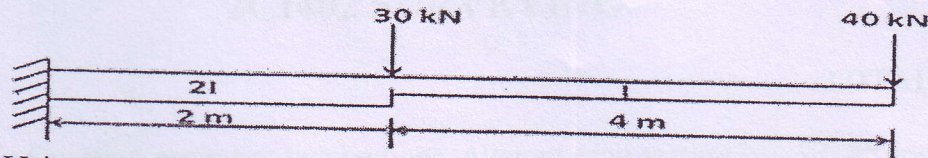
(B)   Using Double integration method determines the equation of the deflection   **05**
curve for cantilever beam loaded by uniformly distributed load on full
span. Also find slope and deflection at free end. Take EI constant.

Que. 5   **Attempt following question**

(A)   Find Fixed End Moments & Reactions at Supports. Draw SFD and BMD   **05**
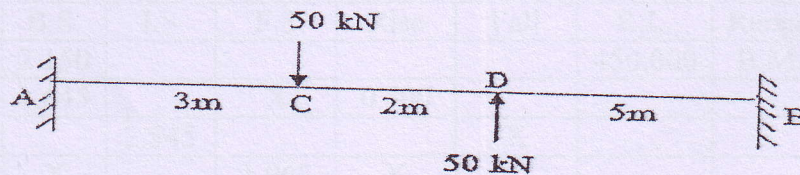for beam shown below.
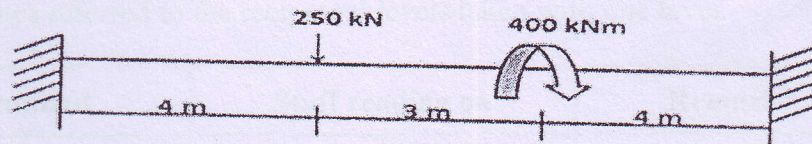
(B)   Analyses the Beam with considering M$_A$ as redundant as Shown in figure below.   **05**
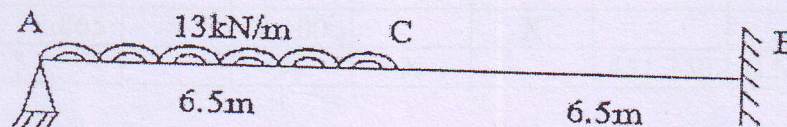Using Consistent Deformation Method, draw B.M.D.
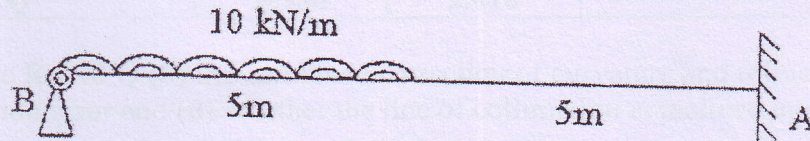
OR

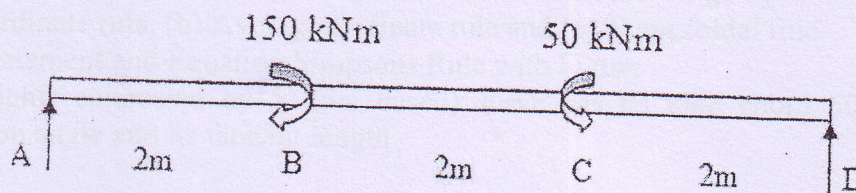**Que. 5**   **Attempt following question**

(A)   Find fixed end moments for a beam shown in figure below. Draw S.F.D and   **05**
B.M.D.

(B)   Analyses the Beam with V$_A$ as redundant as Shown in figure below. Using   **05**
Consistent Deformation Method, draw B.M.D.

Que. 6   Find the deflection at the points of application of the couples by using Macaulay's   **10**
method. Take EI=41500 kNm^2

END OF PAPER