morning
Date: 30/11/2015.

Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester 5TH Civil Engineering

Regular Examination Nov – Dec 2015

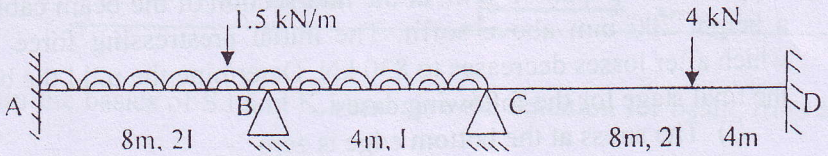
2CI501 STRUCTURE ANALYSIS – II

Time: 3 Hours **Total Marks: 70**

Instruction: 1. Assume suitable data
2. Right figure indicate for full marks
3. All questions are compulsory.

Section - I

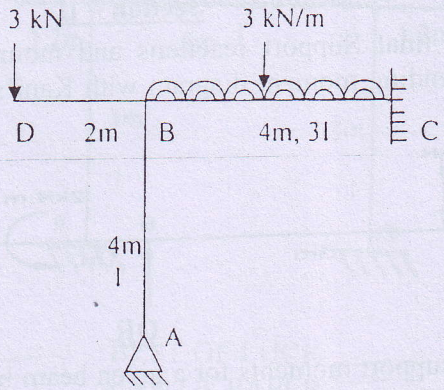
Que. – 1 **(A)** Analyze a continuous beam ABCD by Stiffness method. 'B' sinks by 10 mm. $E = 2X10^5$ N/mm^2, $I = 16 X 10^6$ mm^4. Draw BMD for the same. **09**



(B) Define properties of high strength material required for prestressed concrete. **03**

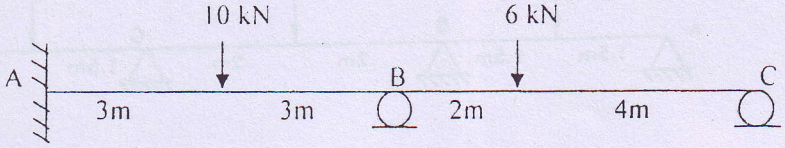
OR

Que. – 1 **(A)** Analyze the frame shown in figure below with stiffness method. Draw SFD and BMD **09**



(B) Explain stress analysis of prestressed concrete **03**

Que. – 2 **(A)** Analyze the beam shown in figure below, considering redundant at B and C only with flexibility method. Take EI constant. **06**

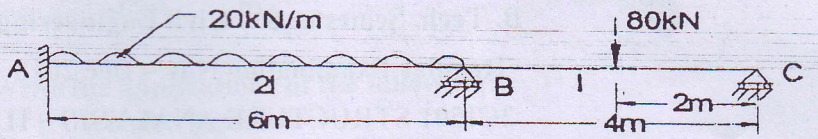


(B) An unsymmetrical I-section beam is used to support an imposed load of 2 kN/m over a span of 8m. the sectional details are top flange, 300mm wide and 60mm thick; bottom flange, 100mm wide and 60mm thick; thickness of the web 80mm; overall depth of the beam 400mm. at the centre of the span, effective prestressing force of 100kN is located at 50mm from the soffit of the beam. Estimate the stresses at the centre of span section of the beam for the following load condition: **06**

i) Prestress + self-weight
ii) Prestress + self weight + live load

OR

Que. – 2 (A) Analyze the beam shown in figure below, considering redundant at B and C only with flexibility method. 06



(B) A prestressed concrete beam 600 mm X 900 mm in section has a span of 10m and is subjected to live load of of 80 kN/m excluding dead load of beam. The stressing cables placed along 200 mm below the longitudinal centroidal axis provide an effective prestressing force of 5600 kN. Consider losses 15%. Draw stress distribution diagram at mid span. Take density of concrete 25 kN/m^3. 06

Que. – 3 (A) A prestressed concrete beam of rectangular section 250 mm X 600 mm is simply supported on a span of 8 m. at the mid-section of the beam cables are located at a height 200 mm above soffit. The initial prestressing force is 1000 kN and which after losses decreases to 830 kN. Determine the u.d.l the beam can carry at the final stage for the following cases. 06

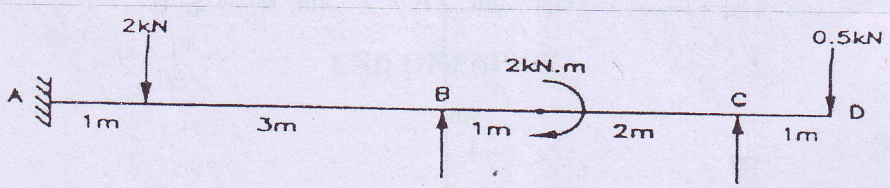
(i) The stress at the bottom edge is zero

(ii) The stress at the bottom edge reaches a cracking tensile stress of 4 N/mm^2

(B) Write down advantages and disadvantages of curved (shell) structure. 05

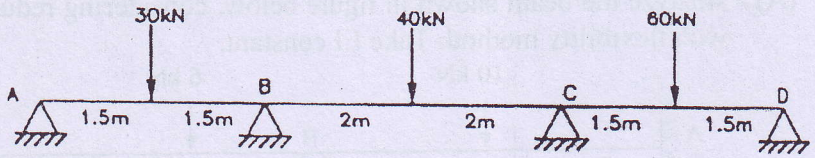
Section – II

Que. – 4 Determine the final Support reactions and moments. Also draw shear force diagram and bending moment diagram with Kani's method. Take span AB= 2I, BC= 1.5 I 12

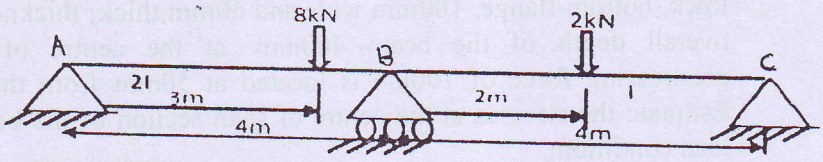


OR

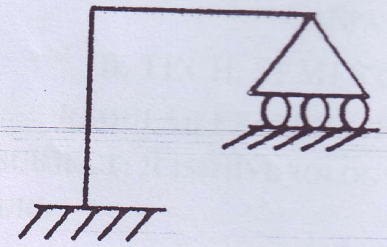
Que. – 4 Determine the support moments for a given beam by Kani's method if support B sink by 10 mm.Take $E=210X10^3$ kN/ mm^2 and $I= 2.4X10^6 mm^4$. Plot SFD and BMD for same. 12

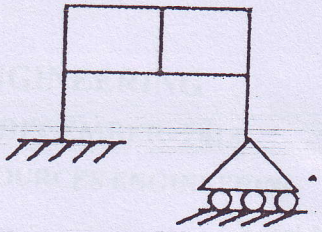


Que. – 5 (A) Analyze the beam given below with moment distribution method and draw BMD for it. 09



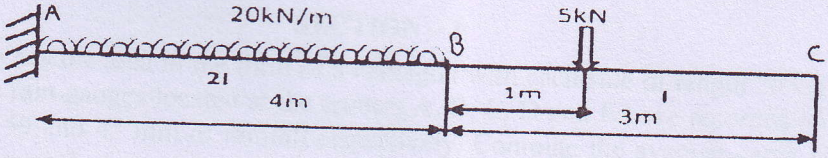
(B) Find out S.I and K.I for figure given below. 03





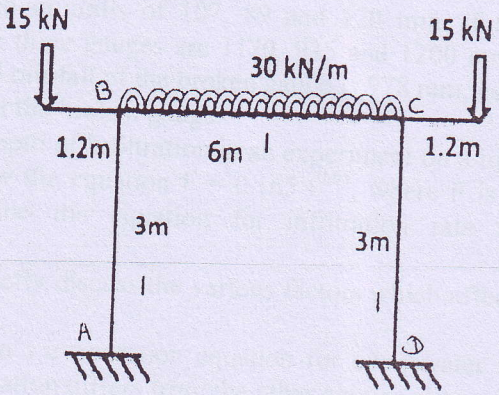
OR

Que. – 5 (A) Analyze the beam given below with moment distribution method and draw BMD for the same. 09



(B) Explain the basics of S.I and K.I and give the equation for beam, truss and plane frame. 03

Que. – 6 Find out the moment and reaction with slope deflection method and plot SFD and BMD for same. 11



BEST OF LUCK
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