

**Government College of Engineering, Aurangabad**  
(An autonomous Institute of Government of Maharashtra)

**T.E. (Civil) / 15/11/16**

End Semester Examination November/December 2016

**AM 341: THEORY OF STRUCTURES-II**

Time: Three Hours

**15 NOV 2016**

Max. Marks: 60

"Verify the course code and check whether you have got the correct question paper"

**N.B:**

1. a) Q.1 is compulsory.
- b) Solve any Two questions from Q.2, Q.3 and Q.4, and
- c) Solve any Two questions from Q.5, Q.6 and Q.7
2. Assume suitable data if necessary and state it clearly
3. Use of non-programmable calculator is allowed

Q.1 State and explain *Any Six* of the following

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- i) Static and kinematic indeterminacy of a structure
- ii) Shape factor of a section
- iii) Plane stress problem of elasticity
- iv) Axial and flexural stiffness of a structural member
- v) Beam moment in arches
- vi) Distribution theorem
- vii) Rotational contribution factor
- viii) Reciprocal deflection theorem

Q.2 a) Derive strain compatibility equations for three dimensional state of stress.

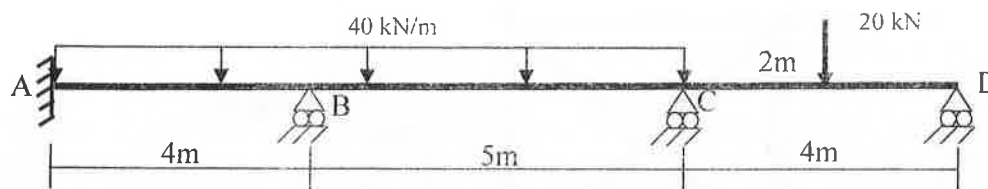
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b) Explain the assumptions of theory of plasticity

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Q.3 Analyse the beam shown in Fig.1 using force method. Draw SFD, BMD and sketch elastic deflection curve. Take  $EI = \text{Constant}$ .

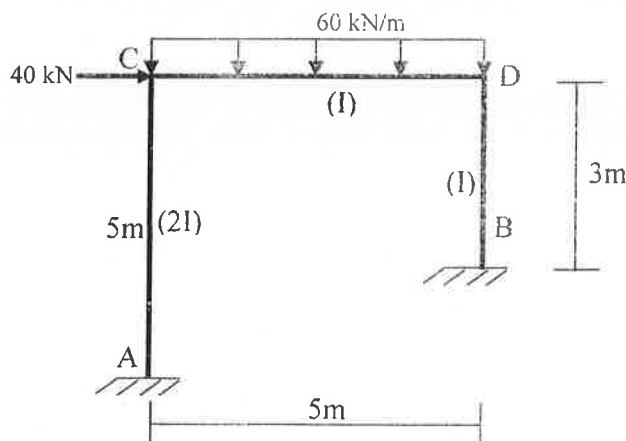
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**Fig. 1.**

Q.4 Analyse the frame as shown in Fig. 2 using Moment Distribution Method. Draw SFD and BMD.

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**Fig. 2.**

Q.5 Analyse the frame as shown in Fig. 3 using Slope Deflection Method. Draw SFD, BMD and sketch elastic deflection curve.

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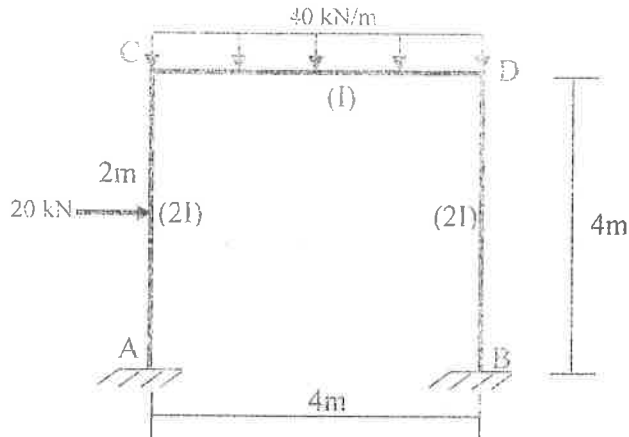


Fig. 3

Q.6 Two hinged arch with supports at same level carries udl over entire span. Derive the expression of horizontal thrust and draw BMD for the following cases,  
a) Semicircular and b) Parabolic arch

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Q.7 a) Analyse the pin jointed truss as shown in Fig. 4. Assume members with constant axial rigidity.

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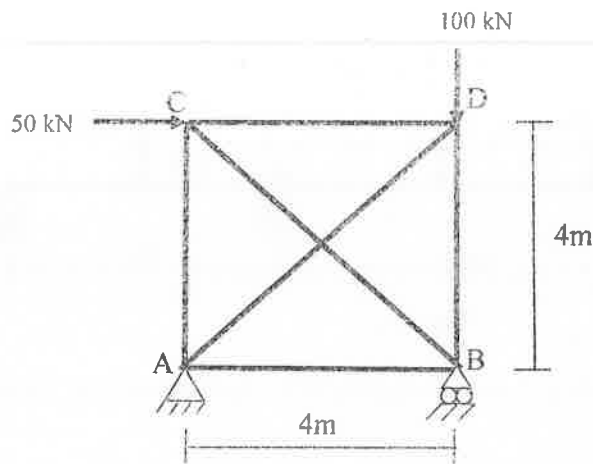


Fig. 4

b) A propped cantilever AB of 3 m span, is fixed at A and simply supported at B. It carries udl over 2 m starting from fixed end. Analyse the beam using displacement method.

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