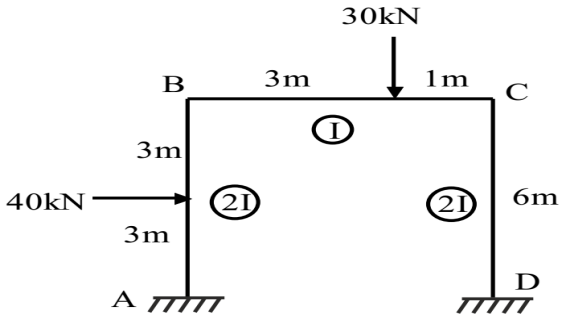
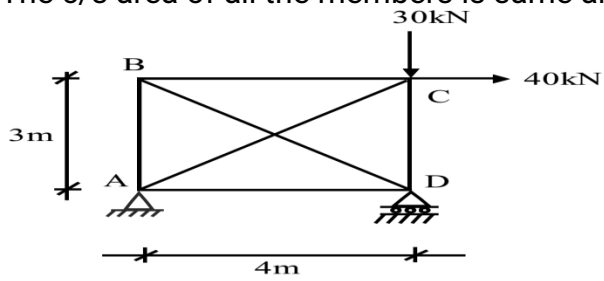
QUESTION BANK

(SA-I) ACADEMIC YEAR (2020-21)

Determine the fixed end moment for the span BC as shown in figure



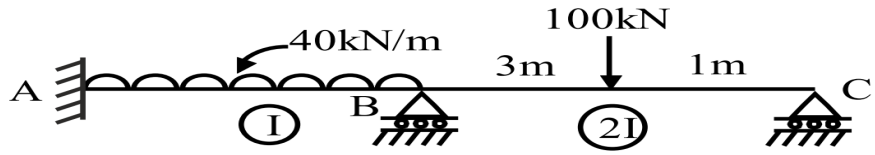
Using the strain energy method find forces the **member AD** of truss loaded as shown in fig.
The c/s area of all the members is same and they made up of same material



A indeterminate structure may be defined as……..

Write any two limitation of Euler buckling load……..

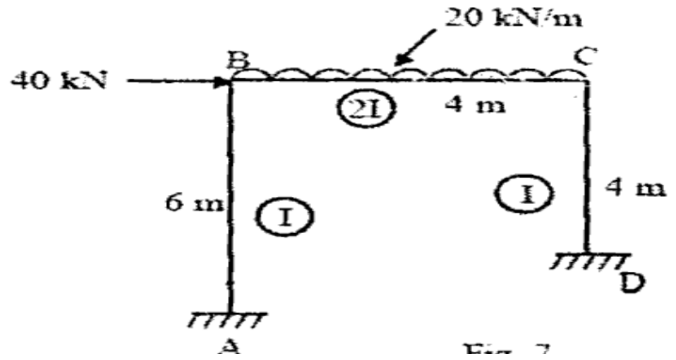
Analyze the continuous beam ABC shown in fig. using three moment equation and calculate only reaction at B .



A three moment theorem may be defined as …….

What is the main difference between Portal frame and cantilever bay method write in short or in one line sentence

Calculate the fixed end moment for the span AB as per the given figure



When a uniformly distributed load, longer than the span of the girder, moves from left to right, then the maximum bending moment at mid-section of span occurs when the uniformly distributed load occupies

- Less than the left half span
- Whole of left half span
- More than the left half span
- Whole span

Define Euler's load in short or in one line sentence

Define Strain energy in short or in one line sentence

A single rolling load of 8 KN rolls along the girder of 15 m span.The absolute maximum bending moment will be

8 kN.m

B. 15 kN.m

C. 30 kN.m

D. 60 kN.m

Principle of superposition is applicable when

- Deflections are linear functions of applied forces
- Material obeys Hooke's law
- The action of applied forces will be affected by small deformations of the structure
- None of the above

While using three moment equation , affixed end of the continuous beam is replaced by an additional span of

A. zero length

B. infinite length

C. zero moment of inertia

D. none of the above

The degree of kinematic indeterminacy of pin jointed plain frame is given by

a. 2j-r
b. j-2r
c. 3j-r
d. 2j+r

For the two hinged arch, if one of the support settled down vertically, yhen the horizontal thrust

a) Is increased
b) Is decreased
c) Remains unchanged
d) Remains zero

The Castiglion's second theorem can be used to compute the deflection

a) In statically determinant structure only
b) For any type of structure
c) At the point under the load only
d) For the beams and frames only

The maximum B.M due to train of wheel on simply supported girder occurs at

a) At the Centre of the span
b) Under the wheel load
c) Never occurs under the wheel load
d) None of the above

Muller Breslau's principle for obtaining the influence line is applicable to

a. Truss
b. Statically determinant beam and frame
c. Statically indeterminate structure, the material of which is elastic and follow Hook's law
d. All of the above

In slope and deflection method the deformation are considered to be caused by

a) Bending moment
b) Shear force
c) Axial force
d) None of the above

Principle of superposition is applicable when

(A) Deflections are linear functions of applied forces

(B) Material obeys Hooke's law

(C) The action of applied forces will be affected by small deformations of the structure

- (D) None of the above

The three moments equation is applicable only when

A) The beam is prismatic

- (B) There is no settlement of supports
- (C) There is no discontinuity such as hinges within the span
- (D) The spans are equal

The fixed support in a real beam becomes in the conjugate beam a

- (A) Roller support
- (B) Hinged support
- (C) Fixed support
- (D) Free end

While using three moments equation, a fixed end of a continuous beam is replaced by an additional span of

(A) Zero length

- (B) Infinite length
- (C) Zero moment of inertia
- (D) None of the above

Bending moment at any section in a conjugate beam gives in the actual beam

(A) Slope

- (B) Curvature
- (C) Deflection
- (D) Bending moment

A simply supported beam deflects by 5 mm when it is subjected to a concentrated load of 10 kN at its centre. What will be deflection in a 1/10 model of the beam if the model is subjected to a 1 kN load at its centre?

- (A) 5 mm
- (B) 0.5 mm
- (C) 0.05 mm
- (D) 0.005 mm

The carryover factor in a prismatic member whose far end is fixed is

- (A) 0
- (B) 1/2
- (C) 3/4
- (D) 1

The ordinates of influence line diagram for bending moment always have the dimension of

a) force

b) length

c) force x length

d) force/length

The maximum bending moment at the left quarter point of a simple beam due to crossing of UDL of length shorter than the span in the direction left to right, would occur after the load had just crossed the section by

a) one-forth of its length

b) half of its length

c) three-fourth of its length

d) its full length

The horizontal thrust due to rise in temperature in a semicircular two hinged arch of radius R is proportional to

a) R

b) R2

c) 1/R

d) 1/R2

When a load is applied to a structure with rigid joints

a) there is no rotation or displacement of joint

b) there is no rotation of joint

c) there is no displacement of joint

d) there can be rotation and displacement of joint but the angle between the members connected to the joint remains same even after application of the load

Unequal settlements in the supports of a statically determinate structure develop

a) reactions from supports

b) member force

c) no reactions

d) forces in limited members

Four point loads 8, 15, 15 and 10 kN have centre-to-centre spacing of 2 m between consecutive loads and they traverse a girder of 30 m spam from left to right with 10 kN load loading. The maximum shear force at 8 m from left support will be

(a) 8.2 kN

(b) 25.4 kN

(c) 30.2 kN

(d) 42.2 kN

The point in the cross section of beam through which if load acts there will not be any twisting of the beam but there will be only bending is known as

(a) centre of gravity

(b) centroid

(c) shear centre

(d) All the above

The absolute bending moment in a simply supported beam of span 10 m due to a moving load of 40 kN/m spanning over 5 m is

(a) 375 kN m at 2.5 m from end A

(b) 375 kN m at midpoint

(c) 375 kN m at 3.75 m from end A

(d) 500 kN m at midspan

Define stiffness……..

Define Degree of freedom……..

Define strain energy…….

Write any two application of three moment theorem

Write any two application of strain energy