CED 253: Building Construction and Drawing

Unit I: Introduction

1. Enlist types of building as per national building code
2. Write down all components of building along with its function
3. Differentiate between load bearing structure and framed structure
4. What are advantages of cavity walls
5. Enlist types of partition walls and explain with sketches partition walls along with functions of it.
6. Write down of advantages and disadvantages of load bearing structure.
7. Write down of advantages and disadvantages of nonload bearing structure or framed structure.
8. What is mean by composite structure.Explain it along with diagram.
9. Write a note on various components of a building.
10. Explain materials required and construction procedure for load bearing wall construction.
11. Write short note on following i) Brick Noggingpartition ii) A.C. slab partition iii) metal lath partition iv) clay block partition

UnitII : Functional Planning of Building

1. State and explain principles of building planning
2. Write a short note on following: i) Aspect ii) Roominess iii) Circulation iv) Grouping
3. What is mean by orientation of building. Explain different types of orientation of building.
4. Explain concept and design of energy efficient buildings
5. Write a short note on Building Bye laws.
6. Explain importance of building bye laws to be followed while planning a residential building.
7. Draw a plan of residential bungalow for family in new city township. Consider plot size 9 m x 12 m, choose scale 1:50, plinth height 0.9 m. provide details like verandah, living hall, bedroom, master bed room, separate WC and bathroom, kitchen room, dining room, store room, dog legged type staircase. Draw working drawing plan and schedule of openings.
8. Discuss with suitable example how building bye laws affect the planning of residential building.

Unit III: Foundation

1. Write down types of foundation according to their classification.
2. Explain underpinning with the help of neat sketches .
3. What are causes of failure of foundation and their preventive measures.
4. Explain types of foundation in detail.
5. What are the types of foundation to be used in black cotton soil.
6. What do you understand by setting out of foundation.Explain the procedure in detail.
7. What is mean by underpinning. Explain underpinning with the help of neat sketch.
8. State and specify soil condition where pile foundation is recommended.

Unit IV: Special Aspects of Construction

1. What are the various methods of damp proofing. Explain any two with neat sketch.
2. Write down detailed note on various types of methods of anti-termite treatment.

3. Explain at length how fire proof construction is executed.
4. Write a detailed note on termite proofing.
5. Explain in detail various types of damp proofing with the help of neat sketches.
6. Write a note on construction joints in columns and slabs.
7. Enlist causes of dampness.
8. Enlist the factors affecting the acoustical design of auditorium.
9. What is the difference between damp proofing and water proofing.

Unit V: Building components and their basic requirements

1. Discuss the types of stairs and their suitability with neat sketches.
2. Design and draw a dog legged staircase of floor to floor height 3.25 m.
3. What is mean by plinth in construction of building along with its necessity.
4. Explain with neat sketches different types of turning type of stairs.
5. Enlist end explain various technical terms of staircase.
6. What are different types of doors according to different criteria.
7. What are different types of doors according to different criteria.
8. State and explain requirements of foundation, plinth, walls, columns,stair shed and roof in building.

Unit VI: Miscellaneous

1. Discuss the importance of safety in construction.
2. Write a short note on wall cladding.
3. Write a detailed note on raking shores.
4. Write in brief on wall cladding, wall papering and glazing works.
5. Write a short note on shoring.
6. What do you mean by scaffolding. Explain its types.
7. What are the materials used in wall cladding.
8. What are the methods of storage of materials.
9. How to prevent accidents on site.

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CED 254: Fluid Mechanics II

UNIT-I

1. Give the different geometric shapes of the channel section
2. enlist the basic equation of fluid flow applied to channel flow
3. What are the difference between pipe flow and open channel flow
4. Derive an expression for the discharge through a channel by chezy's formula
5. Draw and explain specific energy diagram
6. explain the reynolds experiment to classify the flow
7. Explain specific force
8. Explain critical flow
9. Enlist the various minor losses
10. Draw diagram of different slope profile
11. Define specific force
12. Define flow in open channel give the different types of flow in open channel
13. Derive an expression for most economical trapezoidal channel
14. Derive an expression for most economical triangular channel
15. Describe velocity distribution in a channel section
16. Explain specific energy and specific energy curve
17. Explain condition for maximum discharge for a given value of specific energy
18. Derive an expression for continuity equation applied to channel flow
19. Derive an expression for momentum equation applied to channel flow

UNIT-II

1. Draw a diagram showing uniform and non-uniform flow
2. Find an expression for a loss of energy head for hydraulic jump
3. Explain rapidly varied flow and gradually varied flow
4. Derive an expression for depth of hydraulic jump
5. Derive an expression for loss of energy due to hydraulic jump
6. Derive an expression for depth of hydraulic jump in terms of route number
7. Explain the computation of gvf a by the state method
8. Describe measurement of flow of a irrregular channels
9. Define manometric head and obtain different equation for manometric head
10. Draw neat diagram of a vessel and give its function
11. Explain venturi flume
12. Describe a draught tube

UNIT- III

1. Explain concept of boundary layer
2. Define different types of boundary layer
3. Define separation of boundary layer
4. Explain force on immersed bodies in flowing fluid
5. Explain lift and drag
6. Explain aerofoil
7. Explain magnus effect

8. Define turbulent flow and laminar flow

UNIT-IV

1. Difference between impulse and reaction turbine
2. Define static head
3. how will you classify the turbine
4. Draw neat sketch of the pelton wheel turbine
5. Describe briefly the function of various main component of a pelton turbine
6. Explain with neat sketch volute casing, vortex casing, casing with guide blades
7. Define impact of jet
8. Draw neat diagram of inlet and outlet velocity triangles
9. Defined turbines and pumps
10. Enlist the general component of hydroelectric power plant
11. Give the different efficiencies of a turbine
12. Define unit power and unit rate of flow of a turbine
13. Draw neat diagram of vortex casing
14. Draw neat sketches of pelton wheel turbine and francis turbine
15. Classify hydraulic turbine
16. Describe pelton wheel turbine
17. Describe radial flow reaction turbine
18. Describe inward radial flow turbine
19. Describe francis turbine
20. Describe axial flow reaction turbine
21. Explain significance of specific speed

UNIT-V

1. What is a function of air vessel in reciprocating pump
2. give the function of multistage pump
3. What do you mean by the runway speed
4. Obtain an expression for discharge, work done and power required for single acting reciprocating pump
5. What do you mean by priming of centrifugal pump
6. Define reciprocating pump
7. Find an expression for the efficiency of a series of moving curved vanes when i get off auto strike the winds at one of its tips prove that maximum efficiency is 50% when u = v

UNIT-VI

1. What are the methods of dimensional analysis
2. Describe the release method for dimensional analysis
3. For fraud model law find the ratio of velocity discharge force work and power in terms of length scale
4. Define geometric similarities
5. What are the advantages of distorted model
6. What is the principle of hydraulic ram

7. Draw an indicator diagram considering the effect of acceleration in suction and delivery pipe
8. Explain dimensionless number
9. Explain dimensional homogeneity
10. Explain dimensional analysis using rayleigh method
11. Explain buckingham π theorem method
12. Explain similitude

CED 255: Surveying-II

Unit I: Curves

Two Marks Questions

1. What is Right and Left hand curve?
2. Enlist types of horizontal curve.
3. What is a relation between degree and radius of curve?
4. Differentiate between point of curve and point of tangency.
5. What is the mathematical expression for tangent length and versed sine of curve?.
6. Mention the various method of setting out of simple curve.
7. What is sag and Summit curve?
8. What is a relation between degree and radius of curve?.
9. What is the mathematical expression for tangent length and versed sine of curve?
10. Differentiate between point of curve and point of tangency.
11. What is mid ordinate and Apex distance? Give the mathematical expression.
12. Explain normal chord and Sub chord.
13. What is reverse curve?
14. What do the term rear tangent and forward tangent‟ means?
15. Define transition curve and state its advantages.
16. What is compound curve?

Sample Detail Questions

1. Describe the method for setting out simple circular curve by offset from chord produced.
2. With usual notations derive the equation (intrinsic) of an ideal transition curve
3. With usual notations derive the expression for Rankien's deflection angle method
4. Two tangents PQ and QR to a railway curve meet at an angle of 140^0. Find the radius of curve which will pass through M, 24m from intersection point Q, the angle PQM being 100^0.
5. Two tangents meet at chainage 1011m, deflection angle being 38^o .A Circular curve of radius 300m is introduced in between them Calculate
   Tangent Length
   Length of circular curve
   Chainage of tangent points.
   Deflection angles for setting out first three pegs and last peg on curve (peg interval is 20m)
6. A transition curve is to be used at each end of circular curve having radius of 398m.Speed of vehicle is 70 km/hr and width of road is 12m. If rate of change of radial acceleration is $0.3m/sec^3$. Calculate suitable length for transition curve and super elevation
7. Following data refers to a right hand compound curve
   Total deflection angle $=78^0$
   Radius of first arc=220m
   Radius of second arc=250m
   Chainage of point of intersection =1504.80m
   Deflection angle of first arc$=50^0$
8. Two straight lines having a deflection angle of $25^0 12^{'}$ are to be connected by a circular curve of 502m.If chainage of intersection point is 1010.calculate the data for setting out a curve by Rankien's deflection method. Take the normal chord as a 30m.
9. Following data refers to a simple circular curve
   Angle of intersection $=144^0$

Radius of curve=300m

Chainage of point of intersection =1395m , calculate all the necessary data for setting out curve by offset from chord produced (Peg interval=20m) .

10. Two straight lines having a deflection angle of $25^0 12'$ are to be connected by a circular curve of 500m.If chainage of intersection point is 1010.calculate the data for setting out a curve by Rankien's deflection method. Take the normal chord as a 20m.

Unit II: Geodetic Surveying

Two Marks Question

1. Explain types of errors in surveying
2. What is principle of triangulation in Surveying?
3. Give the classification of triangulation system.
4. What are the important features of laws of accidental error?
5. State the factors on which selection of triangulation station depends.
6. What is base line? What are different methods of measurement?

Answer in Detail

1. Explain principle of least squares
2. State and explain laws of Weights.
3. What is meant by satellite station? Derive the expression for satellite station reduction to centre.
4. The altitude of two proposed stations A and B,75km apart are respectively 240m and 570m.The intervening obstruction at C,40 km from A has an elevation of 280m.Show that A and B are intervisible.
5. The following value recommended for triangle ABC, the individual value measurement be uniformly precise, A= 62^0 28 16 – 6 observations, B= 56^0 44 36-8 Observations, C=60^0 45 56- 6 observations. Find most probable value
6. Explain how to measure the base line.

UNIT – III: Engineering Surveying

Two Marked Questions

1. Define setting out of the building?
2. Define Stake?

Answer in Detail

1. What is difference in between setting out of the building & setting out of the culvert?
2. Write down the step wise procedure of setting out of the building?
3. Write down the step wise procedure of setting out of the culverts?
4. What is difference in between setting out of the building by using circumscribing rectangle & setting out of the building by using rectangle form from centers of the outer foundations?
5. Write down the step wise procedure of setting out of tunnel?
6. Write down the step wise procedure of setting out of the bridge?

Unit IV: Aerial Photogrammetry

Answer in Detail

1. What is photographic scale? Derive the equation of photographic scale with neat sketch
2. What are the advantages of aerial Photogrammetry?
3. Define relief displacement. Derive the expression with neat sketch
4. Write a note on terrestrial Photogrammetry?
5. Explain procedure for aerial survey.
6. Differentiate between Aerial and terrestrial Photogrammetry
7. Numericals based on Scale
8. Write a short note on stereoscopy.

Unit V: Remote Sensing & GIS

Answer in Detail

1. What do understand by Electromagnetic Spectrum?
2. Explain different types of remote sensing.
3. Explain different types of scanners used in remote sensing.
4. What are the various elements of visual interpretation?
5. Explain the term digital image processing.
6. Write a short note on GPS.
7. What are the main Components of GIS?
8. Define GIS. Explain the applications of GIS in different Fields.
9. What are the application of GIS in civil Engineering (Transportation engineering)?
10. What is the importance of Georefrencing in GIS?
11. What are the application of GIS in civil Engineering (Town planning)?
12. Explain Vector and Raster data type in GIS.

UNIT – VI Hydrographic Surveying & Introduction of Total Station, EDM &EDM

02 Marked Questions

1. Define Hydrographic Surveying?
2. Define EDM?
3. Define Soundings?
4. Define Rangers or Range Lines?

Answer in Detail

1. Enlist different types of locating of Soundings?
2. Explain any on type of locating of Soundings?
3. How to calculate horizontal angles by using Nautical Sextant?
4. What is the Nautical Sextant? Explain?
5. Explain Electromagnetic Distance Measurement?
6. Write down the applications of Total Station?
7. What are the advantages and dis-advantages of Total Station?
8. Explain Mirror Stereoscopes?
9. Explain Total Station?
10. What is Electromagnetic spectrum? Explain in brief?
11. Write down step by step procedure of set up of Total Station?

Theory of Structure- I (Revised)

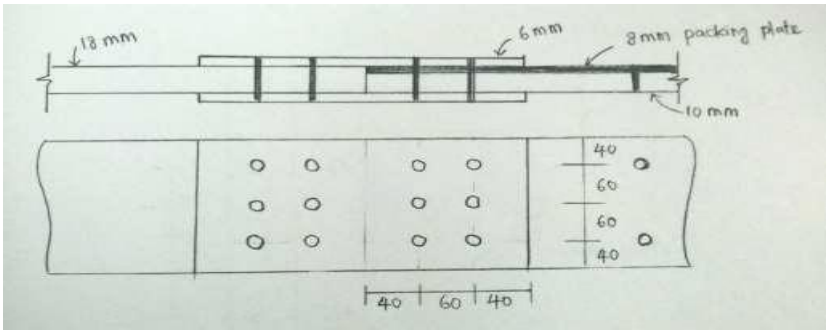
Unit 1: Riveted and welded connection

Q.1: Answer the following questions

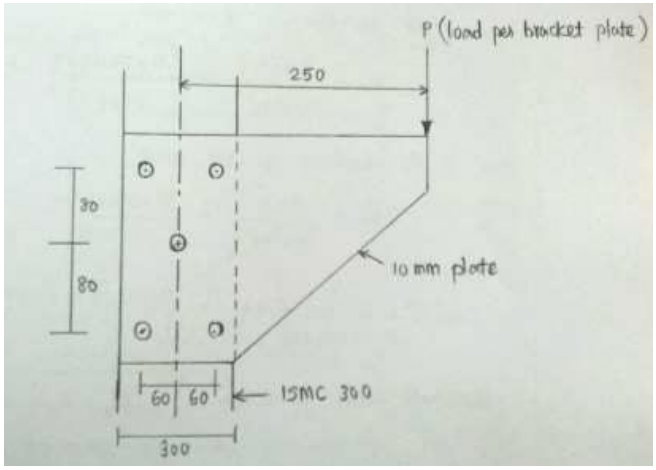
1. List the advantages and limitation of riveted connection
2. List out the failure of riveted joint
3. How will you find the strength of a riveted joint?
4. What are all the various types of rivets?
5. With a neat sketch explain pitch, edge & gauge distance.
6. What are the advantages of welded connections compared to riveted connections?
7. What is meant by strength of fillet weld?

Q.2: Calculate the strength of a 20 mm dia rivet for the following cases. The main plates to be joined are 12 mm thick. i) Lap joint ii) Single cover butt joint; the cover plate being 10 mm thick iii) Double cover butt joint; each of the cover plate being 8 mm thick

Q.3: Two plates 10 mm and 18 mm thick are connected by a double cover butt joint using 6 mm cover plates as shown in figure. Find the strength of joint. Use 16 dia rivets.



Q.4: A bracket plate bolted to a vertical column is loaded as shown in figure. If 20 dia rivets of are used, determine the maximum value of factored load (P) which can be carried safely.



Q.5 Two plates of 16 mm & 14 mm thick are to be joined by a groove weld. The joint is subjected to a factored tensile force of 430 kN. The length of the weld is limited to 175 mm. Assume shop welding. Check the safety of the joint if

i) Single V groove is provided
ii) Double V groove is provided

Q.6: A tie member of truss consist of double angle section ISA 80x80x8 mm welded on the opposite side of a 12 mm thick gusset plate. Design a fillet weld for making the connection in the Workshop. The factored tensile force in the member is 300 kN.

Q.7: A tie member of truss consist of an angle section ISA 65 X 65 X 6 mm of Fe 415 grade, is welded to 8 mm gusset plate. Design a suitable weld to transmit a load equal to full strength of the member, providing

i) Weld on two sides of the angle
ii) Weld on all three sides Assume shop welding.

Chapter 2: Curvature, slope and deflection

Q.1: Derive the bending equation based on simple bending theory.

Q.2: A horizomtal girder of steel having uniform section is 14 m long and it simply supported at ends. It caries concentrated load of 120 kN and 80 kN at two points 3 m and 4 m from the two ends respectively. I for the section of the girder is 16 x 10^8 mm^4 and Es = 210 kN/m^2. Calculate the deflection of the girder at pints under the two loads using Macaulay method.

Q.3: A steel beam is simply supported at the ends on a span of 8 m. It carries a UDL of 8 kN/m on the whole span. In addition, a connection made to the beam at 5 m from the left end exerts a downward load of 80 kN together with a clockwise couple of 60 kNm acting in the plane of bending of the beam. Determine the location and magnitude of the maximum deflection Ixx for the beam section = 4.79 x 10^8 mm^4 and E = 200 kN/mm^2.

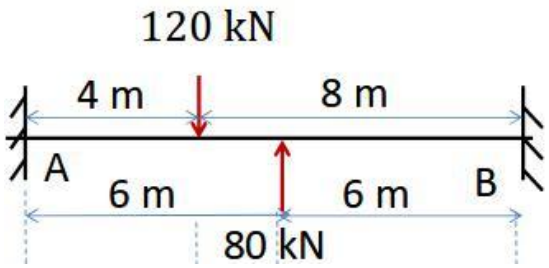
Q.4: A simply supported beam of unifrom section whose moment of inertia is 4.3 x 10^8 mm^4 is shown in the figure. Find the position and maximum deflection. Take E = 200 kN per mm^2.

Q.5: A horizontal girder of steel having uniform section is 12 m long and it simply supported at ends. It caries concentrated load of 120 kN and 80 kN at two points 3 m and 4 m from the two ends respectively. I for the section of the girder is 16 x 10^8 mm^4 and Es = 210 kN/m^2. Calculate the deflection of the girder at pints under the two loads using Moment area method.

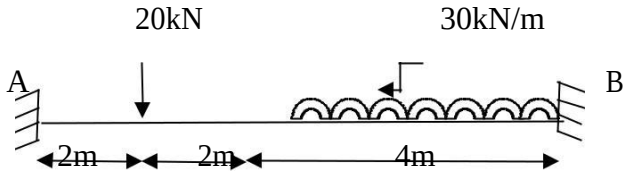
Chapter 3a: Fixed Beams

Q.1: What is mean by sinking of support? Write down expression of end moment and reaction due to it.

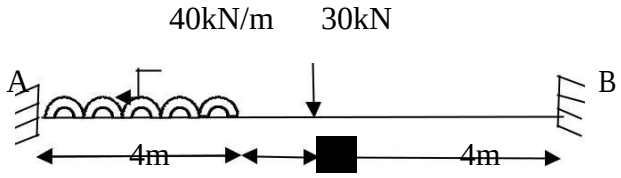
Q.2: Find the fixed end moment at fixed supports and draw SFD and BMD for the fixed beam shown in the following figure.



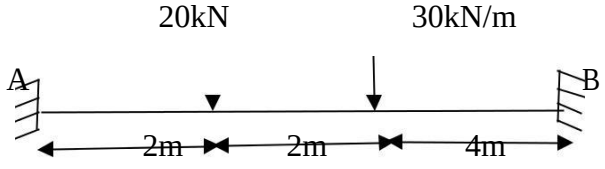
Q.3: Find the fixed end moment at fixed supports and draw SFD and BMD for the fixed beam shown in the following figure.



Q.4: Draw SFD and BMD of fixed beam as shown in fig. If support B sinks by 3 mm. Take E= 210 Gpa and I = $80x10^{-6}$ $m^{4.}$



Q.4: Draw SFD and BMD of fixed beam as shown in fig.

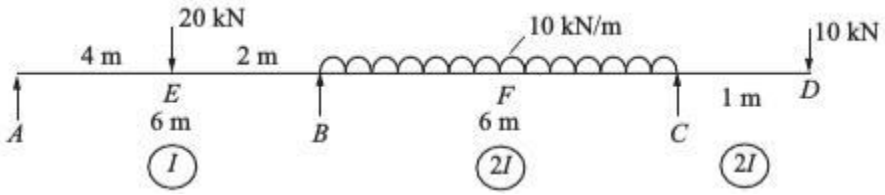


Chapter 3b: Continuous Beams

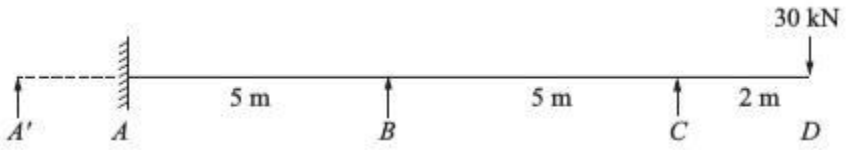
Q.1: State Clapeyron's Theorem (Theorem of Three Moments) for a continuous beam with constant and varying MI.

Q.2: A continuous beam ABCD is simply supported at A and continuous over spans B and C. The span AB is 6 m and BC are of length 6 m respectively. An overhang CD is of 1 metre length.

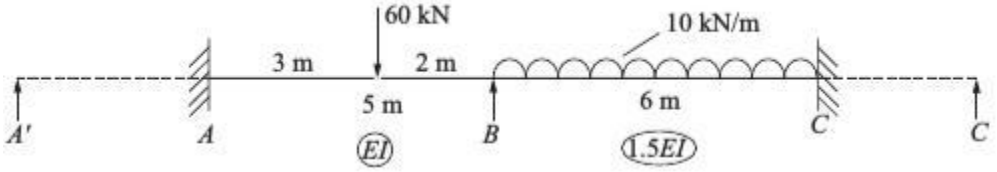
A concentrated load of 20 kN is acting at 4 m from support A. An uniformly distributed load of 10 kN/m is acting on the span BC. A concentrated load of 10 kN is acting at D.



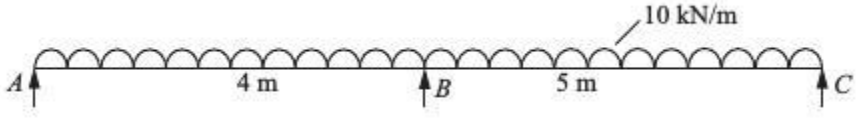
Q.3: A continuous beam ABCD is of uniform section. It is fixed at A, simply supported at B and C and CD is an overhang. AB = BC = 5 m and CD = 2 m. If a concentrated load of 30 kN acts at D, determine the moments and reactions at A, B and C. Sketch the shear force and bending moment diagram.



Q.4 A continuous beam ABC is fixed at A and C. It is continuous over a simple support B. Span AB is 5 m while BC span is 6 m. It is subjected to a concentrated load of 60 kN at 3 m from A and the span BC is subjected to uniformly distributed load of 10 kN/m. The ratio of flexural rigidity of span BC to BA is 1.5. Sketch the shear force and bending moment diagram. Use Clapeyron's theorem of three moments.

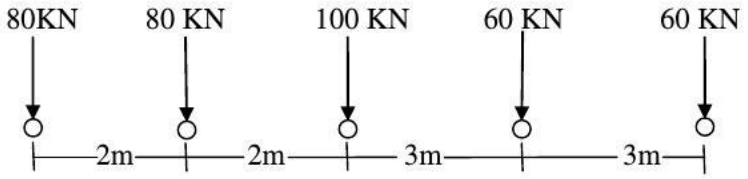


Q.5 A continuous beam ABC is simply supported at A and C and continuous over support B with AB = 4m and BC = 5m. A uniformly distributed load of 10 kN/m is acting over the beam. The moment of inertia is I throughout the span. Analyse the continuous beam and draw SFD and BMD if support B sink by 10 mm. Take E= 210 Gpa and I = $80x10^{-6}$ m^4

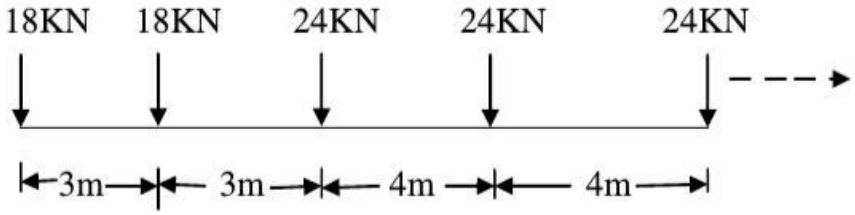


Chapter 5: Rolling loads and influence lines diagram

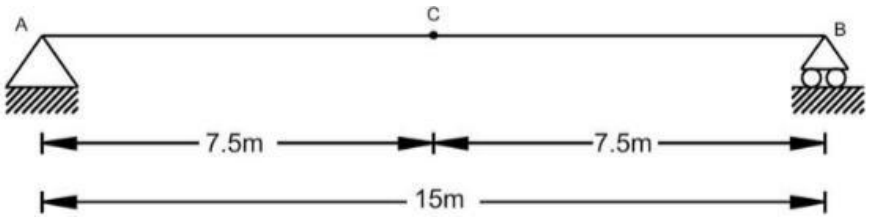
Q.1: Find the absolute maximum bending moment for the simply supported beam of span 24m, when the set of load shown in figure crosses the beam from left to right.



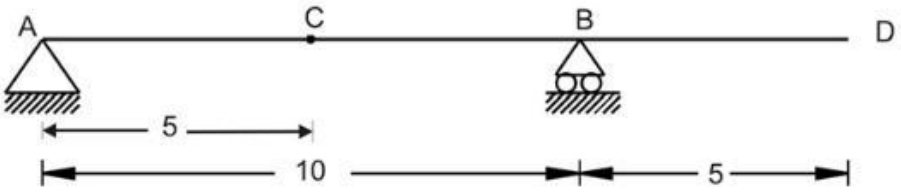
Q.2: A train of a wheel load as shown in figure crosses a simply supported beam of span 25m from left to 15 right with 24KN load leading. Using influence line diagram, determine the maximum bending moment under central load.



Q.3: Construct the influence line for shearing point C of the beam.

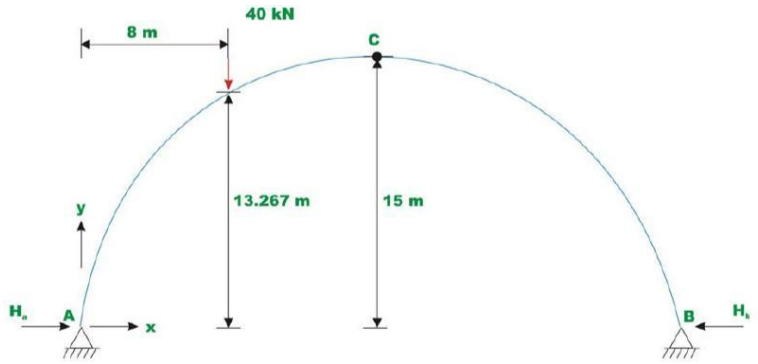


Q.4: Construct the influence line for the moment at point C of the beam shown in the following Figure.

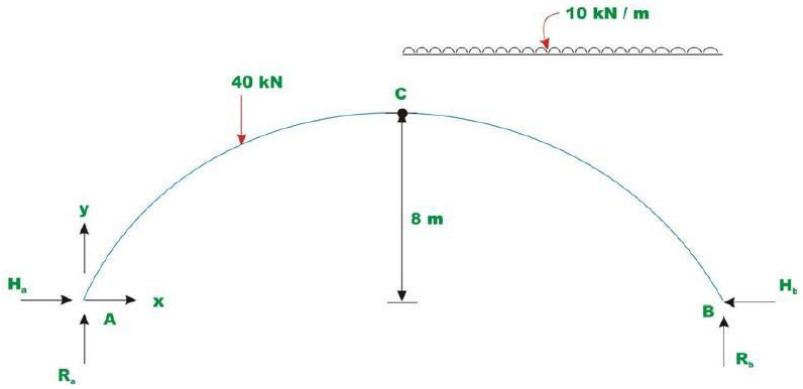


Chapter 6a: Three hinged arches

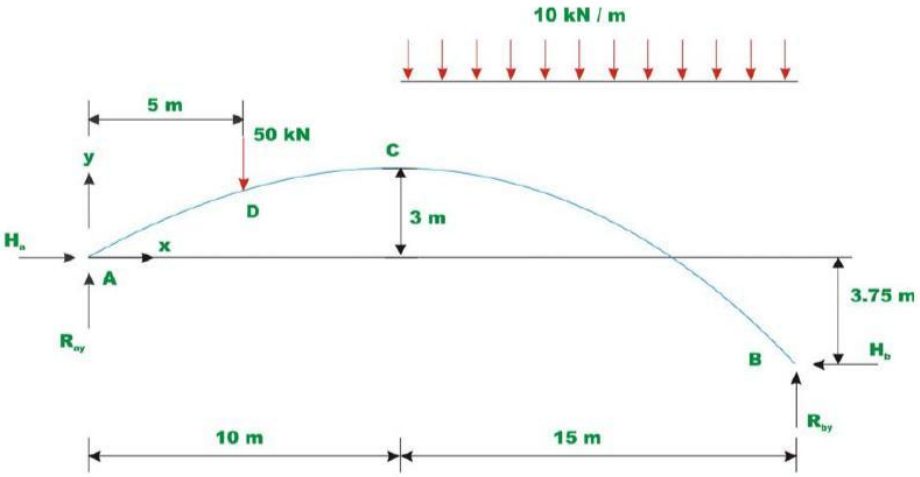
Q.1: A three-hinged semicircular arch of 30 m span having uniform cross section is loaded as shown in Fig . Calculate the location and magnitude of maximum bending moment in the arch.



Q.2: A three-hinged parabolic arch of span 40 m is loaded (with point load at 10 m from left support) as shown in Fig. Calculate the location and magnitude of maximum bending moment in the arch. Draw bending moment diagram.



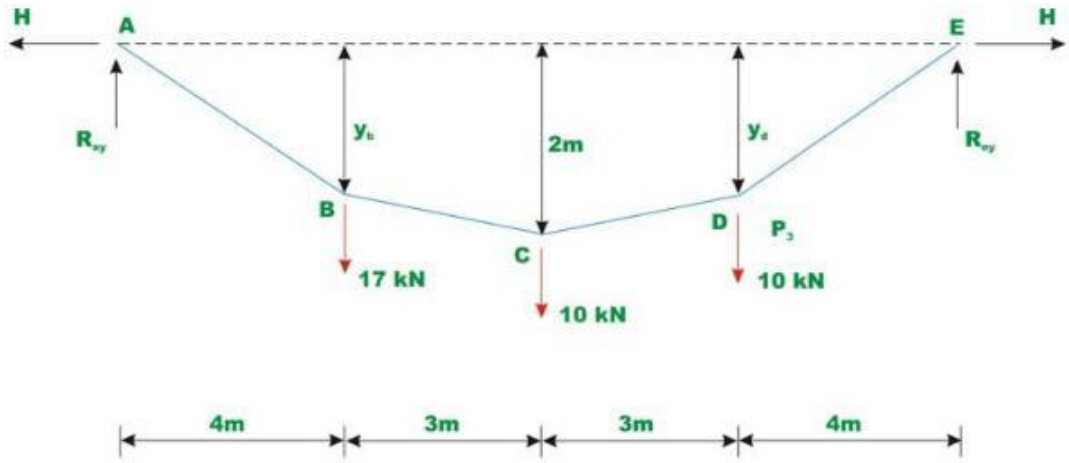
Q.3 A three-hinged parabolic arch of constant cross section is subjected to a uniformly distributed load over a part of its span and a concentrated load of 50 kN, as shown in Fig. The dimensions of the arch are shown in the figure. Evaluate the horizontal thrust and the maximum bending moment in the arch.



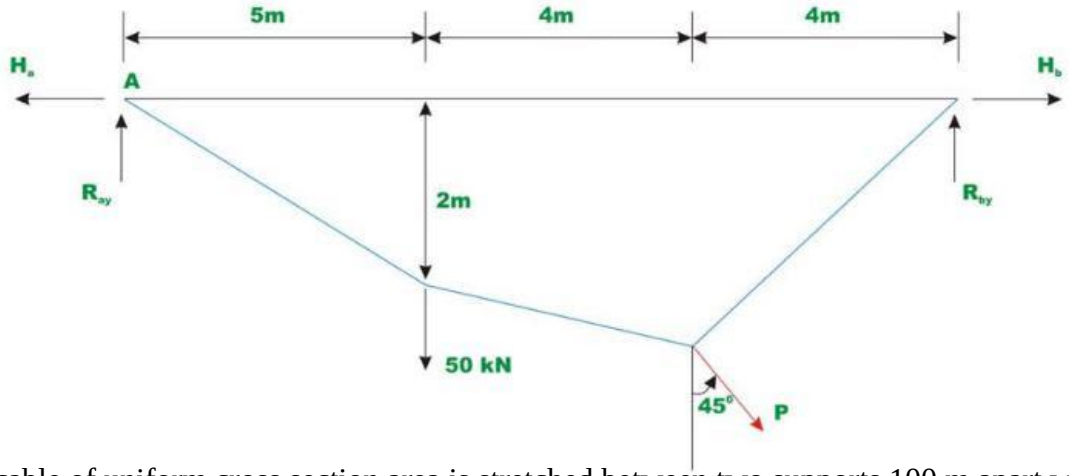
Chapter 6b: Three hinged suspension bridges

Q.1: Determine reaction component at A and B, tension in the cable and the sag at B and E.

Neglect the self weight of the cable in analysis.



Q.2: A cable of uniform cross section is used to support the loading shown in Fig. Determine the reactions at two supports and the unknown sag at C.



Q.3:Acable of uniform cross section area is stretched between two supports 100 m apart with one end 4 m above the other as shown in figure. The cable is loaded with a UDL of 10 kN/m and the sag of the cable measured from the higher end is 6 m. Determine the maximum tension in the cable.