INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad -500 043

COMPUTER SCIENCE AND ENGINEERING

TUTORIAL QUESTION BANK

2016 - 2017

Course Name	:	**STRUCTURAL ANALYSIS - I**
Course Code	:	A40115
Class	:	II B. Tech II Semester
Branch	:	Civil Engineering
Year	:	2016 – 2017
Course Faculty	:	Mr. G. Anil Kumar, Assistant Professor, CE

OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

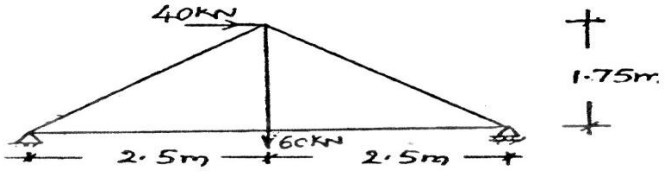
PART – A (SHORT ANSWER QUESTIONS)

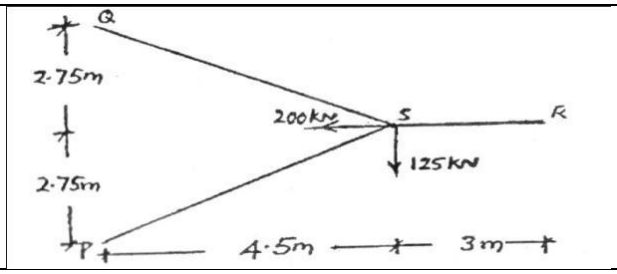
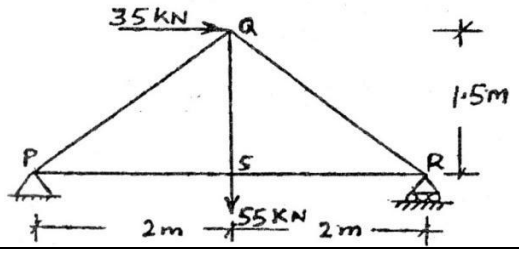
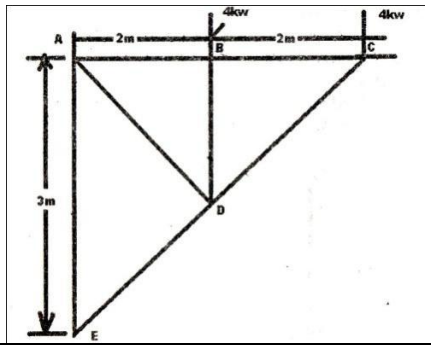
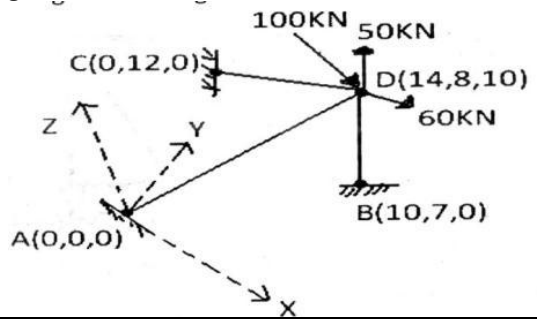
S. No	Question	Blooms Taxonomy Level	Program Outcome
	UNIT – I		
1	Define static indeterminacy	Remember	2
2	Explain different types of indeterminacies	Remember	2
3	Explain internal indeterminacy	Understanding & Remember	2
4	Define Tension Coefficient	Understanding & Remember	2
5	State Kinematic indeterminacy	Understanding & Remember	2
6	Write different methods for computing deflection of determinate beam	Understanding & Remember	2
7	Difference between Internal and External Stability	Understanding & Remember	2
8	What are the different types of frames based on stability	Understanding & Remember	2
9	What are the different types of frames and explain the same with neat diagrams	Understanding & Remember	2
1	Define Statically Indeterminacy and Degree of Indeterminacy	Understanding &	2

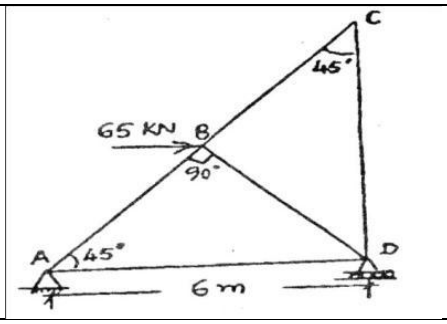
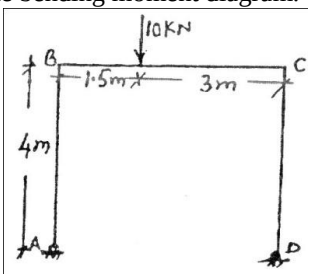
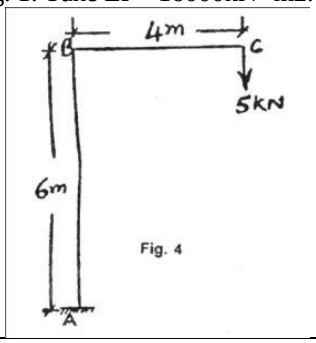
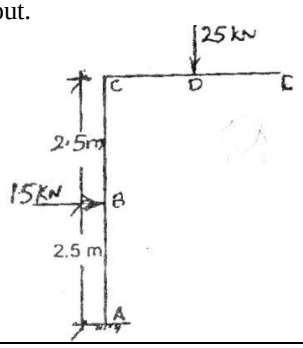
S. No	Question	Blooms Taxonomy Level	Program Outcome
		Remember	
	UNIT – II		
1	Define term deflection of a beam.	Remember	2
2	State conjugate beam theorem	Remember	2
3	Write relation between load, shear force and bending moment acting on a structure	Understanding & Remember	2
4	State moment area theorems	Understanding & Remember	2
5	Define strain energy	Understanding & Remember	2
6	State the castaglianos theorem	Understanding & Remember	2
7	A steel rod has a square cross section of 10mm x 10mm and a length of 2M. Calculate strain energy when a stress of 400 Mpa is produced by stretching it. Take E = 200 Gpa	Analyze and evaluate	2,5
8	Calculate Strain energy due to shear stress for a member which has a length of 0.5M, 120mm Diameter and a pull of 5KN. Take E = 200 Gpa.	Analyze and evaluate	2,5
9	What is the temperature effect on three hinged arches	Understanding & Remember	2
1	How three hinged arch is different from two hinged arch and explain it	Understanding & Remember	2
	UNIT – III		
1	What are the reaction values for propped cantilever beam when it carries point load and udl	Remember	2
2	Calculate maximum bending moment for a propped cantilever beam which carries a udl of 10Kn/m for a span of 2m	Analyze and evaluate	2,5
3	Calculate point of contra flexure for propped cantilever beam has a 4m length carries point load of 20KN at free end	Analyze and evaluate	2,5
4	Difference between cantilever beam and propped cantilever beam	Understanding & Remember	2
5	Calculate deflection at mid span for a propped cantilever beam of load 10Kn/m for a span of 4m	Analyze and evaluate	2
6	What is the effect of sinking of support for fixed beam	Understanding & Remember	2
7	What is effect of rotation	Analyze and evaluate	2
8	Calculate slope and deflection for a fixed beam of load 10Kn/m for a span of 4m	Analyze and evaluate	2,5
9	Difference between propped cantilever beam and fixed beam	Understanding & Remember	2
1	A fixed beam of length 3m is subjected to two point loads 9KN at the middle third point. Calculate Bending moment at the fixed end.	Analyze and evaluate	2,5
	UNIT – IV		
1	State Clapeyron's three moment theorem and write equation also.	Remember	2
2	What is the effect of sinking of support in Three moment theorem	Remember	2
3	Explain Continuous beam with neat diagram	Understanding & Remember	2
4	Derive Slope deflection equation in continuous beam	Understanding & Remember	2
5	What is the effect of sinking of support in slope deflection method	Understanding & Remember	2
6	Define stiffness and relative stiffness of a member with different	Understanding &	2

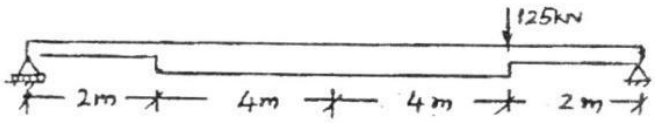
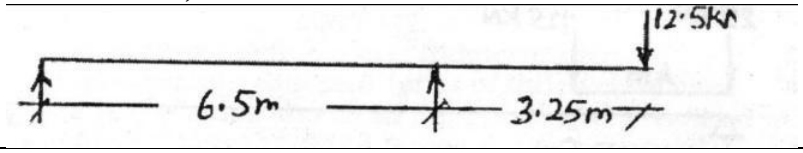
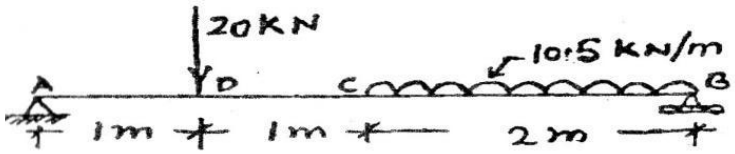
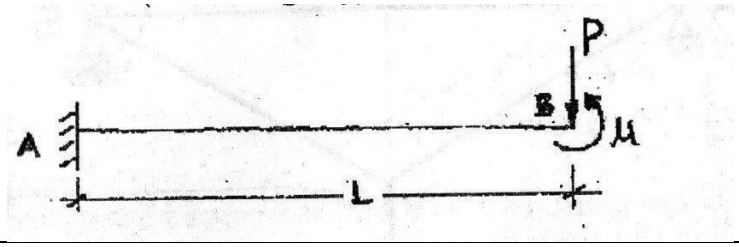
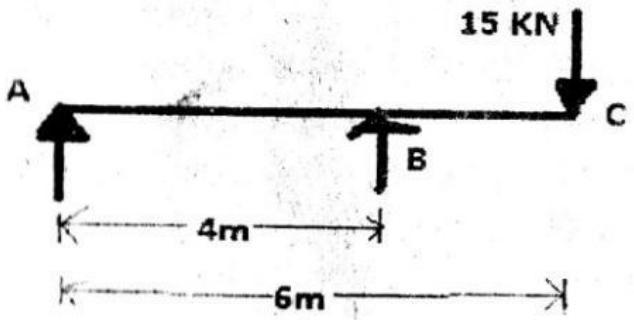
S. No	Question	Blooms Taxonomy Level	Program Outcome
	far end conditions	Remember	
7	Define Carry over factor	Understanding & Remember	2
8	Define Distribution factor and its importance at fixed end and simply support end	Understanding & Remember	2
9	Define Elastic curve	Understanding & Remember	2
1	Importance of Elastic curves in beams.	Understanding & Remember	2
	UNIT – V		
1	Explain the term "Focal Length".	Understanding & Remember	2
2	Define Influence Line.	Understanding & Remember	2
3	List out the uses of Influence lines.	Understanding & Remember	2
4	State Muller Breslau"s Principle.	Understanding & Remember	2
5	Where do you get rolling loads in practice	Understanding & Remember	2
6	What is meant by absolute maximum bending moment in a beam	Understanding & Remember	2
7	Where do you have the absolute maximum bending moment in a simply supported beam when a series of wheel loads cross it	Understanding & Remember	2
8	What do you understand by the term reversal of stresses	Understanding & Remember	2
9	State the location of maximum shear force in a simple beam with any kind of loading.	Understanding & Remember	2
1	What is the absolute maximum bending moment due to a moving udl longer	Understanding & Remember	2

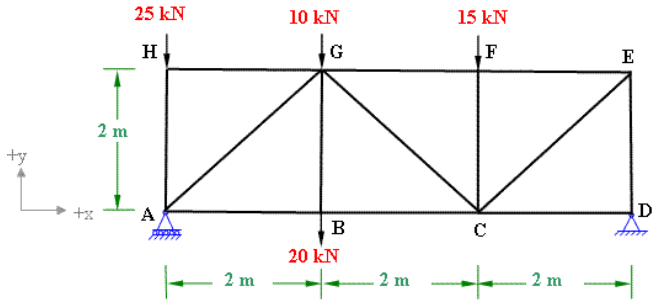
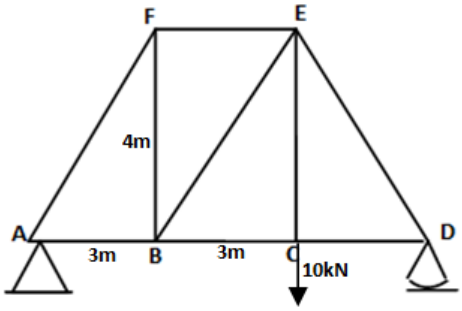
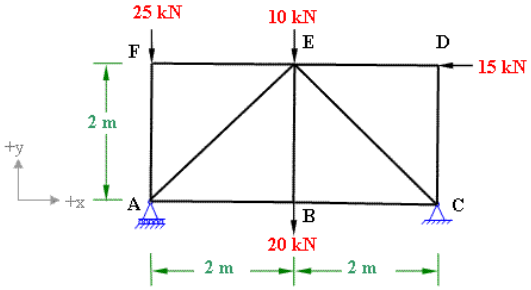
PART – B (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)

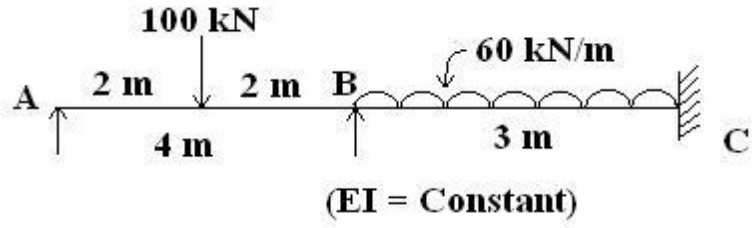
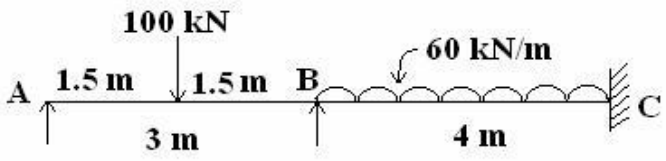
S. No	Question	Blooms Taxonomy Level	Program Outcome
	UNIT – I		
1	Differentiate between pin-jointed and rigid jointed plane frames	Understanding & Analyze	2,5
2	Using method of Tension Coefficient analysis, determine the forces in the members of the plane truss shown in fig. 	Analyze and evaluate	2,5,11
3	Fig shows the plan of a tripod ; the feet P, Q, R being in the horizontal plan and the apex S being 4m above the plane Horizontal loads of 125kN and 200kN are applied at D as shown. Find the forces in all the members assuming that all the joints are pin joints.	Analyze and evaluate	2,5,11

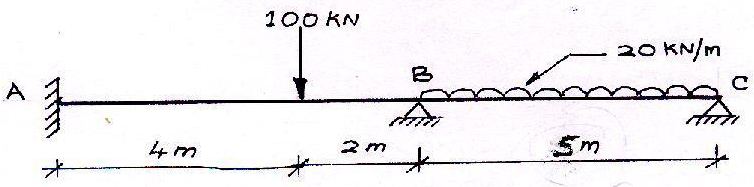
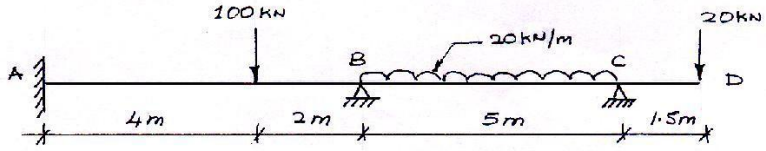
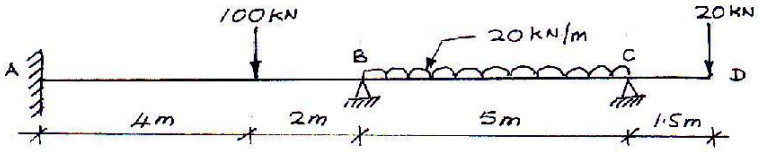
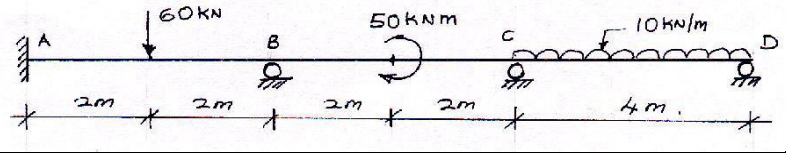
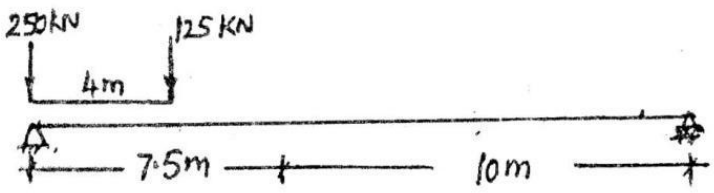
S. No	Question	Blooms Taxonomy Level	Program Outcome
			
4	Analyze the plane truss shown in figure using the method Tension Coefficients and find the forces in the members. 	Analyze and evaluate	2,5,11
5	Using the Method of Tension analyses the cantilever, plan truss shown in figure. Find the member forces. 	Analyze and evaluate	2,5,11
6	Calculate the forces in members of pin jointed space truss shown in figure, using Tension Coefficient method. 	Analyze and evaluate	2,5,11
7	Each bar of the truss shown in fig 2 has a cross section of 625mm2. Calculate the horizontal deflection of the joint C.	Analyze and evaluate	2,5,11

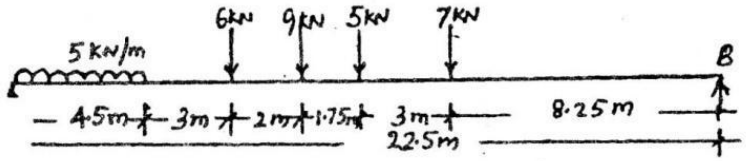
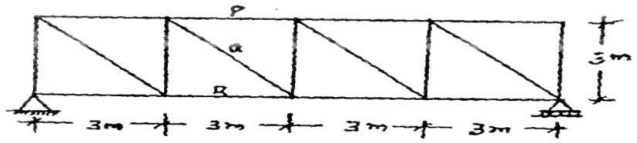
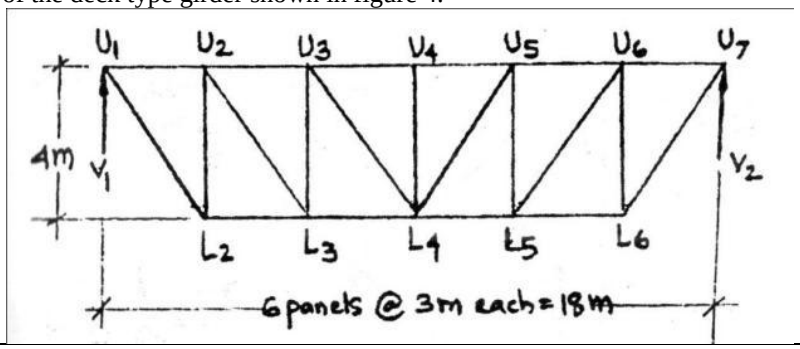
S. No	Question	Blooms Taxonomy Level	Program Outcome
			
8	A portal frame ABCD is hinged at A&D and has rigid joints. The frame is loaded as shown in Fig. Analyze the frame using minimum strain energy method. Plot the bending moment diagram. 	Analyze and evaluate	2,5,11
9	Determine the vertical and horizontal deflections of the free end of the lamp post shown in fig. 1. Take EI = 16000kN- m2. 	Analyze and evaluate	2,5,11
10	Determine the vertical and horizontal deflection at the free end of the bent shown in fig. 4. Use the unit load method. Assume uniform flexural rigidity EI throughout. 	Analyze and evaluate	2,5,11
UNIT - II			
1	Define moment area theorem and explain its applications in beams	Apply, Analyze and evaluate	a

S. No	Question	Blooms Taxonomy Level	Program Outcome
			
2	A beam of 12m span is subjected to a point load of 125kN at point E as shown in figure 1. Find the slopes at point A, B, C & E and the deflections at points C, D & E . Use conjugate beam method.	Analyze and evaluate	b
3	An overhanging beam PQR is loaded as shown in figure 2 . Find the slopes over each support at the right end. Find the maximum upward deflection between the supports. Use Macaulay"s method. Take E = 2.1×105 N/mm2 , I = 6×108 mm4. 	Analyze and evaluate	b
4	A beam AB of 4m span is simply supported as shown in figure 3, determine : TakeE=2×108kN/mm2,I=2×10-5m4 a) Deflection at C, b) Maximum deflection 	Analyze and evaluate	b
5	A cantilever AB of length L is subjected to a concentrated load w and a couple u at the free end, as shown in figure 4, determine the slope and deflection at the free end by moment area method. EI (flexural rigidity) is constant. 	Analyze and evaluate	b
6	Evaluate slope at point A and deflection at point C for the beam shown in fig no. 5, using castigliano"s theorems. Take e = 2×105 N/mm2 and I = 2×108mm4. 	Analyze and evaluate	b
7	Analyse the pin-jointed frame loaded as shown in figure by the stiffness method. Find the force in any one of the diagonal member. All members have the same cross sectional area.	Analyze and evaluate	c

S. No	Question	Blooms Taxonomy Level	Program Outcome
8	Using Method of sections determine the forces in the members BC, GC and GF of the pin jointed plane truss as shown in fig. 	Analyze and evaluate	c
9	Find the forces in the members AF, AB, CD, DE and the reaction forces in A and D. CD=3M. 	Analyze and evaluate	c
10	Using Method of sections determine the forces in all the members of pin jointed truss. 	Analyze and evaluate	c
	UNIT - III		
1	A cantilever of length 10 m carries udl of 800N/m length over the whole length. The free end of the cantilever is supported on a prop. The prop sinks by 5mm. If E=3X105N/mm2 and I=10 8 mm 4 , then the prop reaction	Understanding, Analyze & Evaluate	2,5
2	A cantilever of length 8m carries udl of 2Kn/m run over the whole length. The cantilever is propped rigidly at the free end. If E=1X105N/mm2 and I=10 8 mm 4, then determine reaction at the rigid prop and deflection at the center	Analyze and evaluate	2,5,11
3	A cantilever of length 5m carries a point load of 24kn at its center. The cantilever is propped rigidly at the free end. Determine the reaction at the rigid prop.	Analyze and evaluate	2,5,11
4	A cantilever of length 4m carries a UDL of 1Kn/m run over the whole span length. The cantilever is propped rigidly at the free end. If the value of If E=2X105N/mm2 and I=10 8 mm 4, Determine the reaction at the rigid prop and deflection at the center.	Analyze and evaluate	2,5,11
5	A cantilever of length 8 m carries UDL of 0.8Kn/m length over the whole	Analyze and	2,5,11

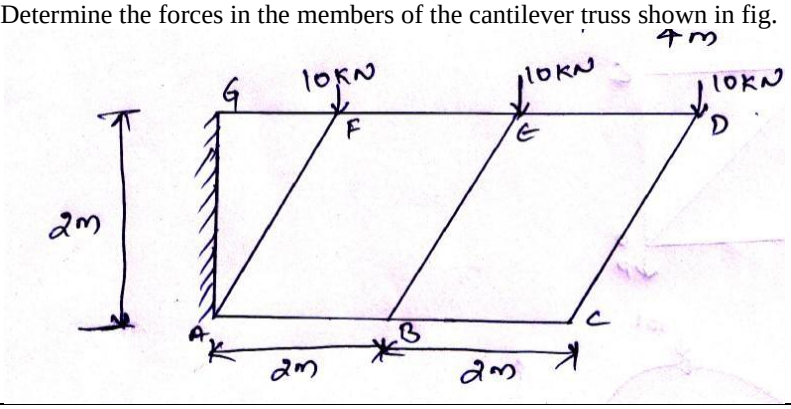
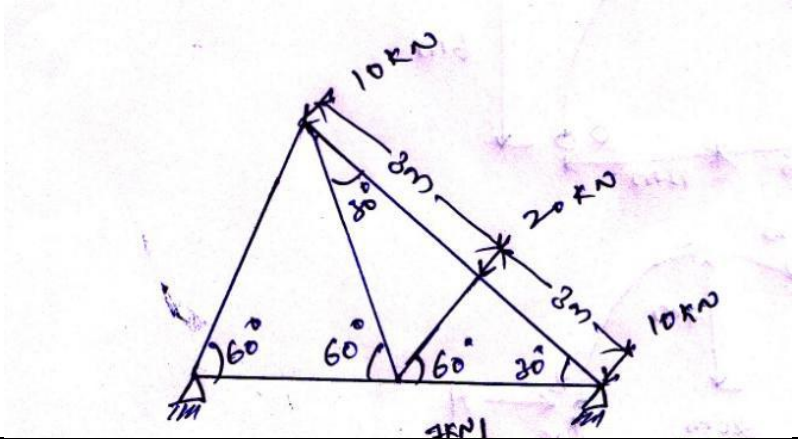
S. No	Question	Blooms Taxonomy Level	Program Outcome
	length. The free end of the cantilever is supported on a prop. The prop sinks by 5mm. If E=2X105N/mm2 and I=10 8 mm 4 , then the prop reaction	evaluate	
6	A fixed beam AB, 5m long, carries a point load of 48kn at its center. the moment of inertia of the beam is 5x107 mm4 and value of E for the beam materials is 2x105 N/mm2. Determine Fixed end moments at A and B, and Deflection under the load.	Analyze and evaluate	2,5,11
7	A fixed beam of length 5m carries a point load of 20KN at a distance of 2m from A. Determine the fixed end moments and deflection under the load, if the flexural rigidity of the beam is 1x104 Kn/m2	Analyze and evaluate	2,5,11
8	A fixed beam of length 6m carries point loads of 20kn and 15kn at distance 2m and 4m from the left end A. Find the fixed end moments and the reactions at the supports. Draw B.M and S.F diagrams.	Analyze and evaluate	2,5,11
9	A fixed beam of length 3m carries tow point loads of 30kn each at a distance of 1m from both ends. Determine the fixing moments and draw B.M diagram.	Analyze and evaluate	2,5,11
10	A fixed beam AB of length 6m carries a uniformly distributed load 3kn/m over the left half of the span together with a point load of 4kn at a distance of 4.5m from the left end. Determine the fixing end moments and support reactions.	Analyze and evaluate	2,5,11
	UNIT - IV		
1	A 3-span continuous beam ABCD has fixed end supports. On end span AB= 6m there is u.d.l. of 20 kN/m, while on CD = 5 m there is a point load of 80 kN at mid span on the central span BC = 5 m, there is a point load of 50kN at 3m from B. If the moment of inertia of BC is twice that of AB and CD analyse by moment distribution method and sketch the B.M.D	Analyze & evaluate	2,5
2	If support B of the continuous beam of Question No. 1 settles by 30 mm, obtain the support moments by slope deflection method, taking I = 400 cm4 and E= 2×105 N/mm2. Sketch the B.M.D.	Analyze and evaluate	2,5,11
3	Using Slope Deflection method obtain the support moments for the 2-span continuous beam shown below. Sketch BMD. 	Analyze and evaluate	2,5,11
4	Using Claperoyn‟s method finds the support movements for the 2-span continuous beam loaded as shown below figure 2. Sketch the B.M.D. 	Analyze and evaluate	2,5,11
5	Using moment distribution method, analyse the 2-span continuous beam ABC, having end supports A and C fixed. There is a load of 5 kN in span AB=5 m at 3 m from A, while on span BC there is a load of 8 kN at 2.5 m from C. Sketch the B.M.D	Analyze and evaluate	2,5,11

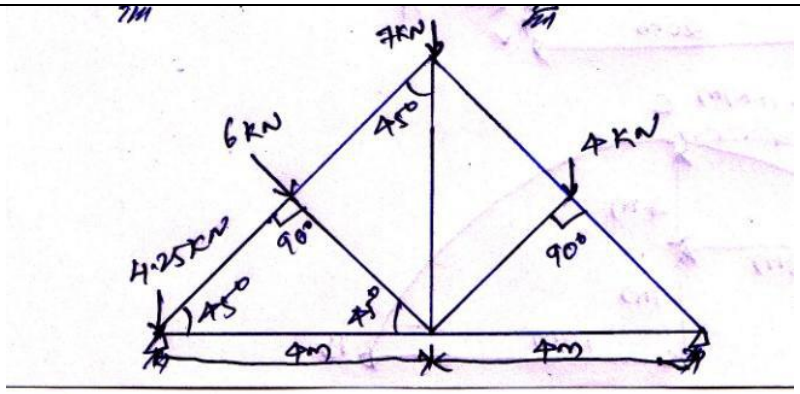
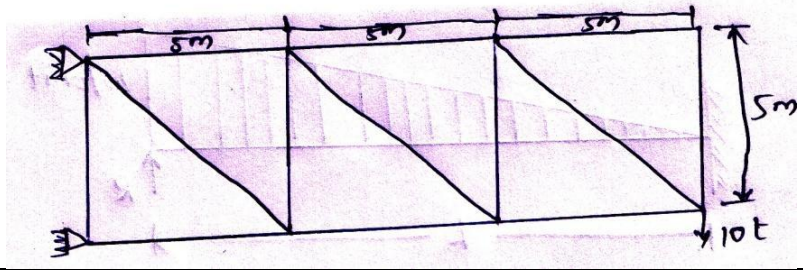
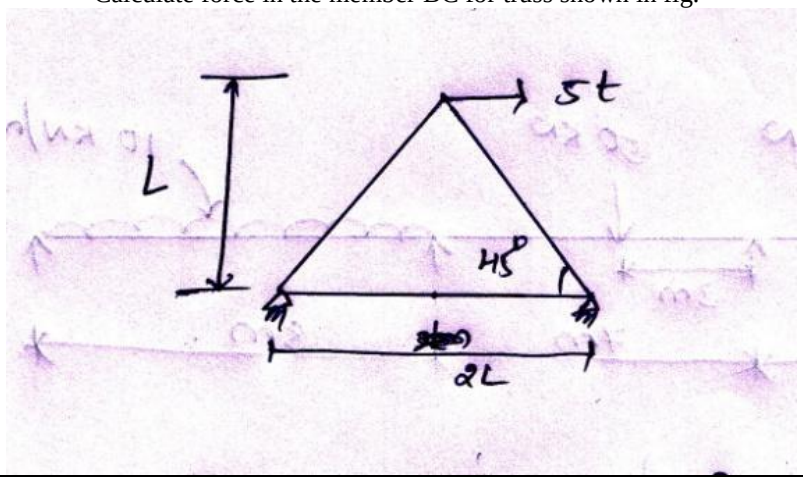
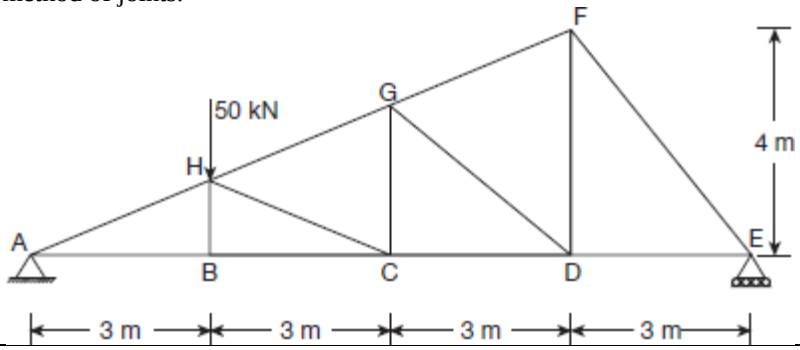
S. No	Question	Blooms Taxonomy Level	Program Outcome
6	If the end spans A and C of the beam given in Question No.2 are simply supported analyse using slope deflection method. Sketch the BMD.	Analyze and evaluate	2,5,11
7	Analyze two span continuous beam ABC in which support B sinks by 5mm by slope deflection method. Then draw Bending moment & Shear force diagram. Take EI constant and draw Elastic curve. 	Analyze and evaluate	2,5,11
8	Analyze continuous beam ABCD by slope deflection method and then draw bending moment diagram. Take EI constant. 	Analyze and evaluate	2,5,11
9	Analyse the continuous beam ABCD shown in figure by slope deflection method. The support B sinks by 15mm. Take E=200x105 KN/m2 and I=120x106m4 	Analyze and evaluate	2,5,11
10	Three span continuous beam ABCD is fixed at A and continuous over B, C and D. The beam subjected to loads as shown. Analyse the beam by slope deflection method and draw bending moment and shear force diagram. 	Analyze and evaluate	2,5,11
UNIT - V			
1	Two point loads of 125kN and 250kN spaced 4m in figure 1, apart cross a girder of 17.5m from left to right with the 125kN load leading. Draw the influence line for the bending moment and find the value of maximum bending moment at a section C, 7.5m from the left hand support. Also find the absolute maximum bending moment due the given load system.  Figure 1	Understanding & Analyze	2,5,11

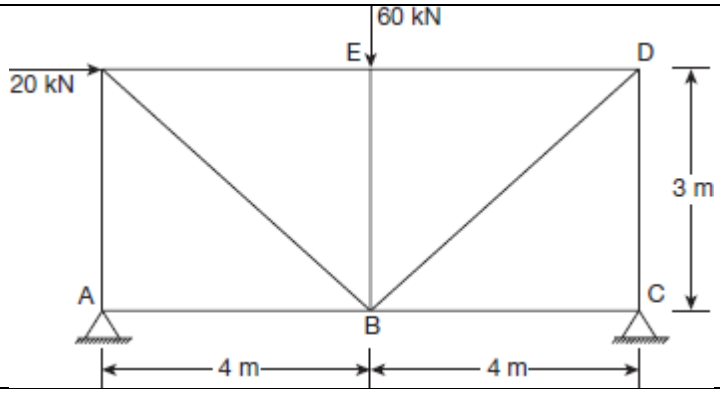
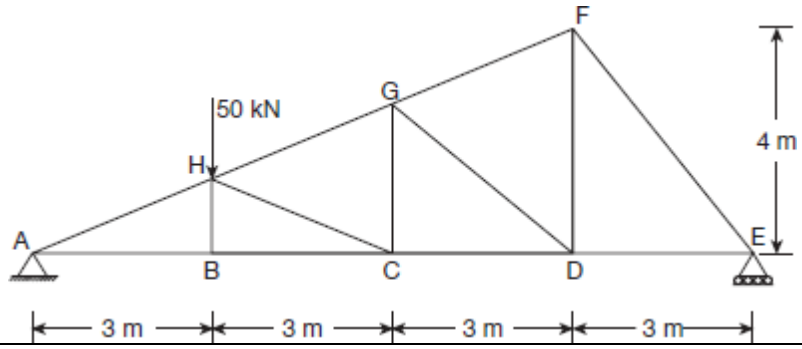
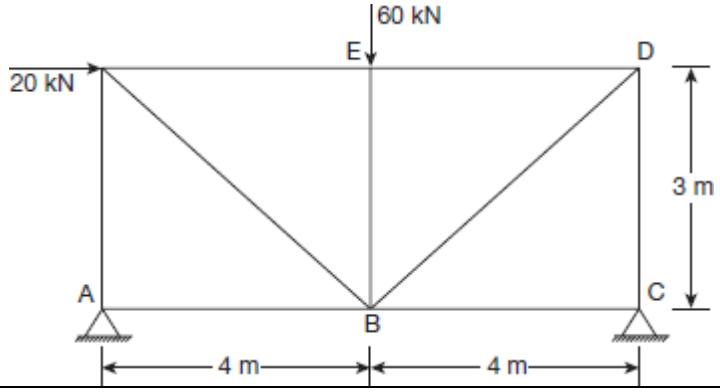
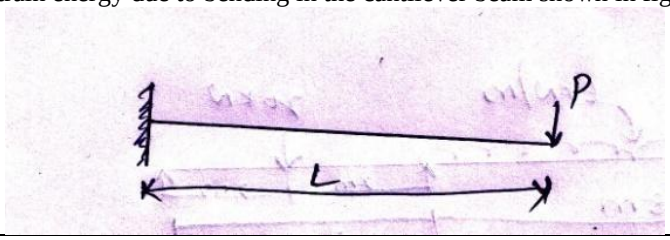
S. No	Question	Blooms Taxonomy Level	Program Outcome
2	Four wheel load of 7,5,9 & 6 kN cross a girder of span 22.5m from the left to right followed by an UDL of 5kN/m of 4m length. The 7kN load is leading. The spacing between the loads are shown in fig 2. The head of UDL is 3m from the last load of 6kN. Using influence lines calculate the shear force and bending moment at a section 8m form the left support when the 5kN load is at the center of span.  Figure 2	Analyze and evaluate	2,5,11
3	Draw the influence line diagrams for the forces in the members P, Q, & R of the truss shown in fig 3.  Figure 3	Analyze and evaluate	2,5,11
4	Draw the influence lines for the members U1U2,, L2L3, U3L3, & U4L4 of the deck type girder shown in figure 4. 	Analyze and evaluate	2,5,11
5	Sketch the influence line diagram for S.F. and B. M. at 4 m from the left end of a simply-supported girder of span 10 m. Hence find the maximum S.F. and maximum B.M. at the section if two wheel loads of 8 kN and 16 kN spaced 2 m apart move from left to right.	Analyze and evaluate	2,5,11
6	Illustrate the procedure to find the forces in the members of a Pratt truss due to moving loads using the influence line diagrams.	Analyze and evaluate	2,5,11
7	A UDL of intensity 10 kN/m and 4 m long crosses a simply supported girder of 12 m span. Sketch the I.L. diagrams for S.F. and B.M. at 1/3 span. Hence find the maximum S.F. and B.M. at the section. Find also the absolute maximum S.F. and B.M.	Analyze and evaluate	2,5,11
8	A UDL of intensity 20 kN/m and 5 m long crosses a simply supported girder of 15 m span. Sketch the I.L. diagrams for S.F. and B.M. at mid span. Hence find the maximum S.F. and B.M. at the section. Find also the absolute maximum S.F. and B.M.	Analyze and evaluate	2,5,11
9	Sketch the influence line diagram for S.F. and B. M. at 5 m from the right end of a simply-supported girder of span 15 m. Hence find the maximum S.F. and maximum B.M. at the section if two wheel loads of 10 kN and 18 kN spaced 4 m apart move from left to right.	Analyze and evaluate	2,5,11
10	Four wheel load of 4, 6, 8, 6 and 4 kN cross a girder of span 25m from	Analyze and	2,5,11

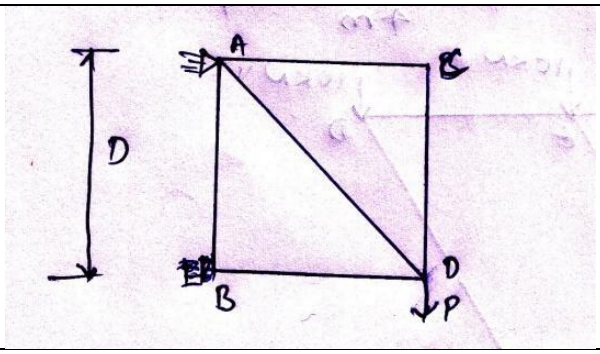
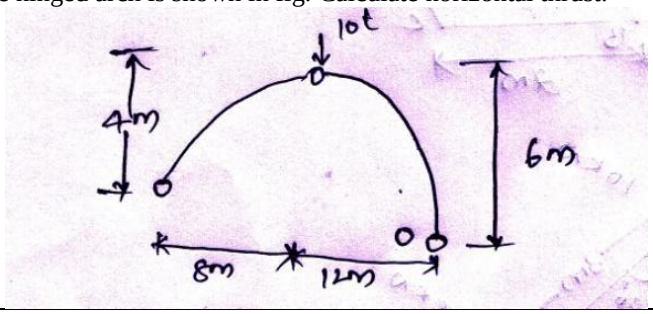
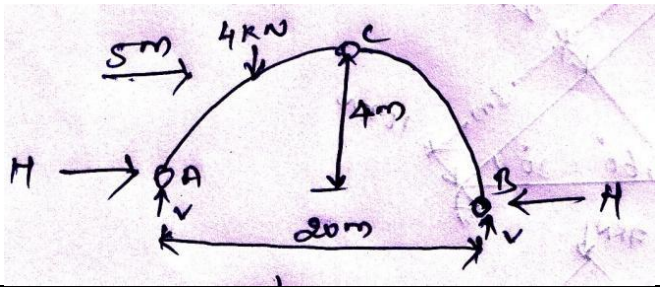
S. No	Question	Blooms Taxonomy Level	Program Outcome
	the left to right. The 10 kN load is leading. The spacing between each load is 2.5m. Using influence lines calculate the shear force and bending moment at a section 8m form the left support when the 8 kN load is at the center of span.	evaluate	

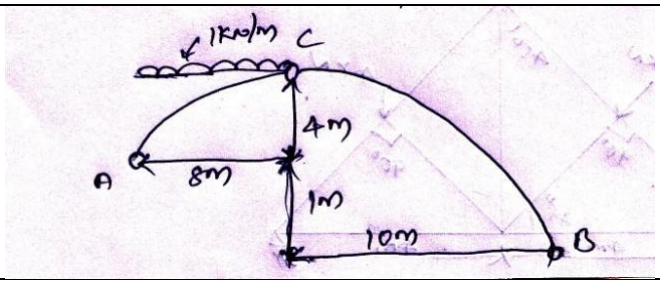
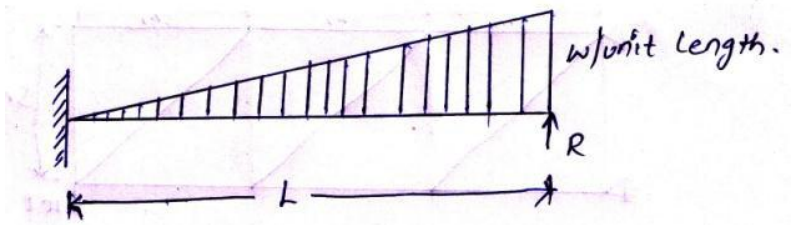
PART – C (ANALYTICAL QUESTIONS)

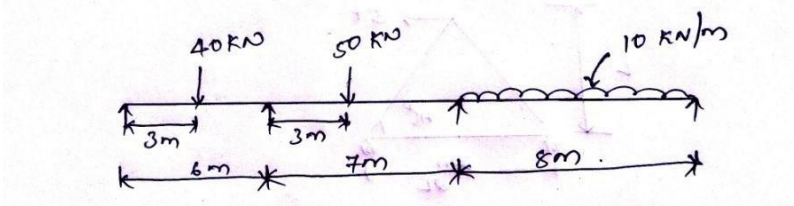
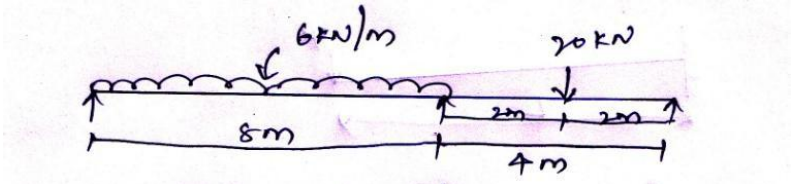
S. No	Question	Blooms Taxonomy Level	Program Outcome
	UNIT – I		
1	What are the different methods for analysis of Frames? Write the assumptions made in analyzing perfect frame.	Understanding	2
2	Determine the forces in the members of the cantilever truss shown in fig. 	Analyze and evaluate	2,5,11
3	For the truss shown in Fig, Determine reactions at the two supports P and Q and forces in the members. 	Analyze and evaluate	2,5,11
4	Find the forces in the members of truss shown in fig.	Analyze and evaluate	2,5,11

S. No	Question	Blooms Taxonomy Level	Program Outcome
			
5	In the cantilever truss shown in fig. Calculate reaction at A. 	Analyze and evaluate	2,5,11
6	Calculate force in the member BC for truss shown in fig. 	Analyze and evaluate	2,5,11
7	Determine the forces in all the members of a truss shown in fig below by method of joints. 	Analyze and evaluate	2,5,11
8	Find the force in all members of the truss shown in Figure 12.55 by method of joints.	Analyze and evaluate	2,5,11

S. No	Question	Blooms Taxonomy Level	Program Outcome
			
9	Determine the forces in all the members of a truss shown in fig below by method of sections. 	Analyze and evaluate	2,5,11
10	Find the force in all members of the truss shown in Figure 12.55 by method of sections. 	Analyze and evaluate	2,5,11
	UNIT - II		
1	The strain energy due to bending in the cantilever beam shown in fig. 	Analyze & evaluate	2,5,11
2	The strain energy stored in member AB of the pin joined truss shown in fig.	Analyze and evaluate	2,5,11

S. No	Question	Blooms Taxonomy Level	Program Outcome
			
3	A simply supported beam of span "l" and flexural rigidity „EI" carries a unit point load at its center. What is the strain energy in the beam due to bending?	Analyze and evaluate	2,5,11
4	The strain energy stored in a simply supported beam of span „l" and flexural rigidity „EI" due to central concentrated load „W" is	Analyze and evaluate	2,5,11
5	If the strain energy absorbed in a cantilever beam in bending under its own weight is „K" times greater then the strain energy absorbed in an identical simply supported beam in bending under its own weight, the the what chould be the magnitude.	Analyze and evaluate	2,5,11
6	A three hinged arch is shown in fig. Calculate horizontal thrust. 	Analyze and evaluate	2,5,11
7	A three hinged arch parabolic arch ABC has a span o 20m and central rise of 4m. The arch has hinges at the ends and at the center. A train of two point loads of 20Kn and 10Kn, 5m apart, crosses this arch from left to right, with 20Kn load leading. Calculate maximum thrust induced at the support.	Analyze and evaluate	2,5,11
8	For the three hinged parabolic arch shown in fig what is the value of horizontal thrust. 	Analyze and evaluate	2,5,11
9	Calculate horizontal thrust at support „A" in a three hinged arch shown in fig.	Analyze and evaluate	2,5,11

S. No	Question	Blooms Taxonomy Level	Program Outcome
			
10	A three hinged semicircular arch of radius R carries a uniformly distributed load W per unit run over the whole span. What will be the horizontal thrust?	Analyze and evaluate	2,5,11
	UNIT - III		
1	A cantilever ABC of length is fixed at the end A and is simply supported at an intermediate support B. The cantilever carries a uniformly distributed load w/unit length over the whole span. Determine the position of the support B so that reactions at A and B are equal.	Analyze & evaluate	2,5,11
2	A beam AB of length L, simply supported at the ends and propped at mid span, carries a udl of w per unit length. Calculate the prop reaction and plot the bending moment diagram.	Analyze and evaluate	2,5,11
3	A cantilever of uniform cross section carries a udl w/unit length. What upward force must be applied at the end to reduce the deflection there to zero?	Analyze and evaluate	2,5,11
4	For the propped beam shown in Fig. Determine the reaction R and sketch the shear force and bending moment diagrams. 	Analyze and evaluate	2,5,11
5	A 5m long fixed beam AB is hinged at the point H, 3M from the end A, thus forming two concentrated cantilever AH and BH. A load of 86Kn acts at a distance of 2m from the left end A. Find the reaction at the hinge and the fixing moments at A and B. Takes IAH=2IBH.	Analyze and evaluate	2,5,11
6	A fixed-ended beam of 9m span carries udl of 15Kn/m (including its own weight) and two pint loads of 200kn at the third point in the span. Assuming rigid end fixing. Find the fixing moment.	Analyze and evaluate	2,5,11
7	For a rigidly fixed beam AB of 5m span carrying udl of 10Kn/m, over the entire span, locate the points of contraflexure and draw the S.F and B.M diagrams.	Analyze and evaluate	2,5,11
8	A beam built in at both the ends is loaded with a triangular loading on its one half of the span, the other load half carries no load. The load gradually increases from zero at the fixed end to 15Kn/m at mid span. The span of the beam is 5m. Determine the bending moments.	Analyze and evaluate	2,5,11
9	A beam of uniform cross section and 5m length, is built in at each end. It carries a udl of 10Kn/m extending from 3m from one end and a concentrated load of 20Kn, 1m from the other end. Sketch the B.M diagram giving principal numerical values.	Analyze and evaluate	2,5,11
10	A beam fixed at both ends is prismatic. It carries a load of varying intensity zero at the end to w/unit length at the center. Determine the fixed moments.	Analyze and evaluate	2,5,11

S. No	Question	Blooms Taxonomy Level	Program Outcome
	UNIT - IV		
1	A continuous beam ABC consists of two consecutive spans of 4m each and carries a distributed load of 60Kn/m run. The end A is fixed and the end C simply supported. Find the support moments and the reactions.	Analyze & evaluate	2,5,11
2	Analyze the continuous beam shown in fig, if the support B sinks by 1cm. The section is constant throughout. E=200Gpa and I=8500cm4. 	Analyze and evaluate	2,5,11
3	Draw S.F and B.M diagrams for a continuous beam loaded as shown I fig. 	Analyze and evaluate	2,5,11
4	A continuous beam ABCD 20m long is continuous over 3 spans. AB=8m, BC=4m, CD=8m. Moment of inertia is 2I, that of BC is I and that of CD is 2I. There is a UDL load of 1500 N/m over spans AB and BC. On the span CD there is a central load of 4000N. The ends are fixed and during loading the support B sinks by 1cm. Find the fixed end moments using slope deflection method. I=1600cm4 and E=200GPa	Analyze and evaluate	2,5,11
5	A continuous beam ABCD 18m long is continuous over 3 spans. AB=8m, BC=4m, CD=8m. Moment of inertia is constant over the whole span. A concentrated load of 4000N is acting of AB at 3m from support A. There is a UDL load of 1000 N/m on BC. On the span CD there is a central load of 4000N. The ends are fixed and during loading the support B sinks by 1cm. Find the fixed end moments using slope deflection method. I=1600cm4 and E=200GPa	Analyze and evaluate	2,5,11
6	Analyze the continuous beam ABCD 3*l* long using slope deflection method is continuous over 3 spans with a uniformly distributed load of *w* per unit length. AB=BC=CD=*l*. The beam is of constant section throughout its length and supports remain at same level after loading.	Analyze and evaluate	2,5,11
7	A continuous beam ABCD 20m long is continuous over 3 spans. AB=8m, BC=4m, CD=8m. Moment of inertia is 2I, that of BC is I and that of CD is 2I. There is a UDL load of 1500 N/m over spans AB and BC. On the span CD there is a central load of 4000N. The ends are fixed and during loading the support B sinks by 1cm. Find the fixed end moments using slope deflection method. I=1600cm4 and E=200GPa	Analyze and evaluate	2,5,11
8	A continuous beam ABCD 18m long is continuous over 3 spans. AB=8m, BC=4m, CD=8m. Moment of inertia is constant over the whole span. A concentrated load of 4000N is acting of AB at 3m from support A. There is a UDL load of 1000 N/m on BC. On the span CD there is a central load of 4000N. The ends are fixed and during loading the support B sinks by 1cm. Find the fixed end moments using slope deflection method. I=1600cm4 and E=200GPa	Analyze and evaluate	2,5,11
9	Analyze the continuous beam ABCD 3*l* long using slope deflection method is continuous over 3 spans with a uniformly distributed load of *w* per unit length. AB=BC=CD=*l*. The beam is of constant section	Analyze and evaluate	2,5,11

S. No	Question	Blooms Taxonomy Level	Program Outcome
	throughout its length and supports remain at same level after loading.		
10	A continuous beam ABCD 18m long is continuous over 3 spans. AB=8m, BC=4m, CD=8m. Moment of inertia is constant over the whole span. A concentrated load of 4000N is acting of AB at 3m from support A. There is a UDL load of 1000 N/m on BC. On the span CD there is a central load of 4000N. The ends are fixed and during loading the support B sinks by 1cm. Analyze using elastic curve. I=1600cm4 and E=200GPa	Analyze and evaluate	2,5,11
	UNIT - V		
1	For simply support beam 10M, I.L.D is drawn for B.M at a section 4m from the let hand support. The maximum B.M at the section due to moving load of 160KN, is equal to	Analyze & evaluate	2,5,11
2	A udl of 30Kn/m and 4m length rolls over a span of 16M. The absolute maximum B.M in KN-M is	Analyze and evaluate	2,5,11
3	A number of wheel loads 3t, 4t, 5t and 6t spaced 2m, 3m and 3m respectively with the 3t load leading from left to right. To find the maximum B.M at 8m from A, what load must be placed at what section?	Analyze and evaluate	2,5,11
4	Three wheel loads 10t, 26t and 24t spaced 2m apart roll on a girder from left to right with the 10t load leading. The girder has a span of 20m. For the condition of maximum bending moment at a section 8m from the left end what load should be placed at the section.	Analyze and evaluate	2,5,11
5	A beam PQRS is 18m long and is simply supported at points Q and R 10m apart. Overhang PQ and RS are 3m and 5m respectively. A train of two point loads of 150Kn and 100Kn, 5m apart, crosses this beam from left to right with 100Kn load leading. What is the maximum sagging moment under 150Kn.	Analyze and evaluate	2,5,11
6	For above problem the passage of loads, what are the maximum and minimum reactions at support R, in Kn respectively?	Analyze and evaluate	2,5,11
7	What is the variation of influence line for stresses unction in a statically.	Analyze and evaluate	2,5,11
8	What is the shape of influence line diagram for the maximum bending moment is respect of a simply support beam.	Analyze and evaluate	2,5,11
9	Five concentrated loads 40Kn, 120Kn, 100Kn and 80Kn spaced at equal distance of 3m between them cross from left to right of a S.S beam of span 40m with the 40Kn load leading. What load gives the maximum bending moment at section C 15m from left?	Analyze and evaluate	2,5,11
10	What is the area of influence line diagram for the reaction at the hinged end of a uniform propped cantilever beam of span L?	Analyze and evaluate	2,5,11

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