Hall Ticket No: | | | | | | | | | | | Course Code: 18SEP101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

M.Tech I Year I Semester (R18) Regular End Semester Examinations – January 2019

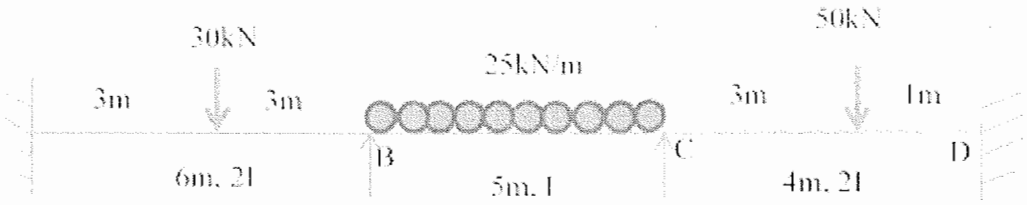
ADVANCED STRUCTURAL ANALYSIS

(Structural Engineering)

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part A or Part B only. Assume any missing data suitably.

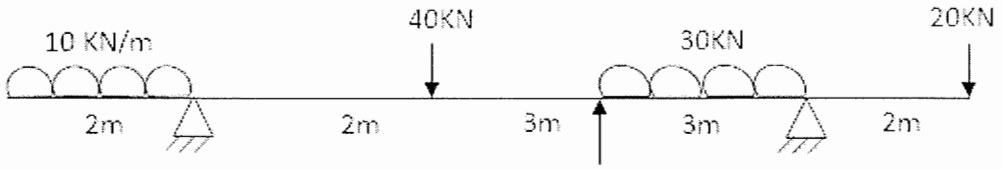
Q.1(A) Analyse the continuous beam shown in figure by stiffness method. 12M



OR

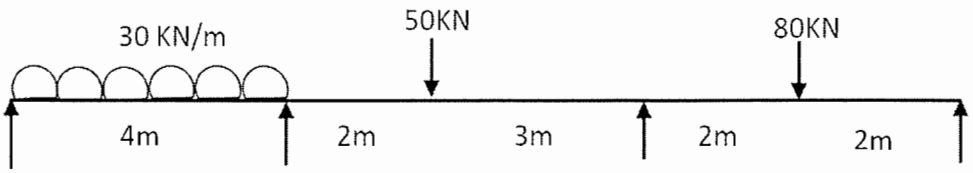
Q.1(B) Explain in detail the equations of equilibrium. 12M

Q.2(A) Analyse the continuous beam shown in the figure below by matrix stiffness method. 12M

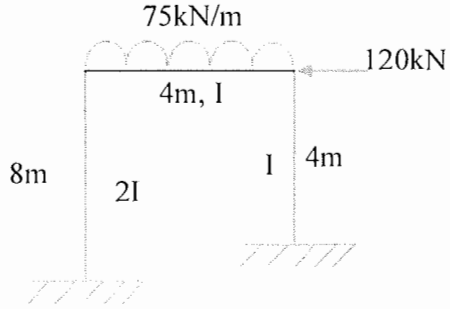


OR

Q.2(B) Analyse the continuous beam by matrix flexibility method. 12M

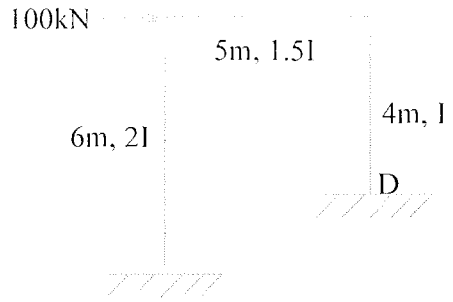


Q.3(A) Analyse the frame shown below using matrix stiffness method 12M

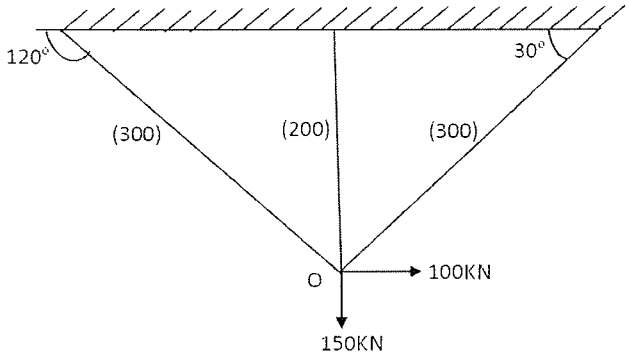


OR

Q.3(B) Analyse the portal frame shown below using matrix flexibility method. 12M

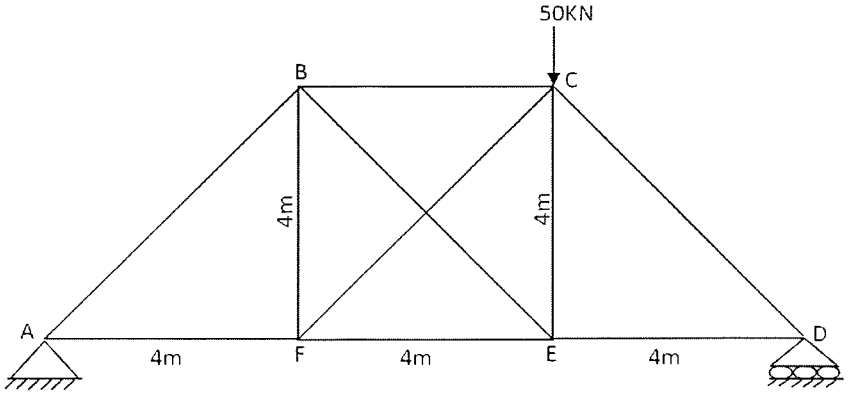


Q.4(A) Analyse the frame given below by matrix stiffness method. The area of each member given in parenthesis in mm^2. Take E=200 KN/mm^2. The height of the frame is given as 1m. 12M



OR

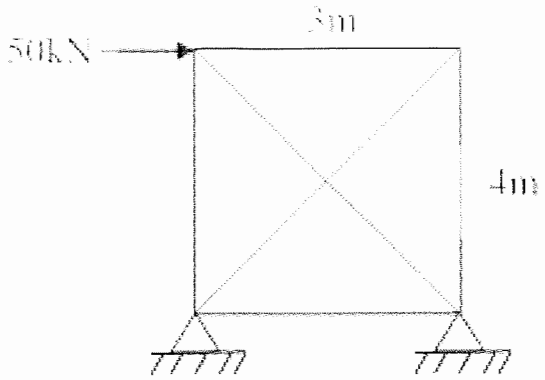
Q.4(B) Analysis of the pin jointed Truss using matrix Flexibility method. 12M



Q.5(A) Explain the procedure for transformation of element stiffness matrix from global coordinates to local coordinates for truss, beams and frames. 12M

OR

Q.5(B) Assemble the stiffness matrix of the entire structure in global coordinates using direct stiffness method. Take constant L/A. 12M



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Hall Ticket No: | | | | | | | | | | | Course Code: 18SEP102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

M.Tech I Year I Semester (R18) Regular End Semester Examinations – January 2019

THEORY OF ELASTICITY AND PLASTICITY

(Structural Engineering)

Time: 3Hrs Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part A or Part B only.

Q.1(A) Write short notes on the following: 12M

a. Elasticity b. Body Forces c. Surface Forces d. Triaxial Stress
e. Plane Stress f. Hooke's law

OR

Q.1(B) (i) What is meant by plane-stress and plane strain condition? Explain with the help of stress and strain equations. 5M

(ii) Determine the body force distribution required for equilibrium if the stress field within an elastic structural member is expressed as 7M

$$\sigma_x = -x^3 + y^2$$
$$\sigma_y = 2x^3 + \frac{1}{2}y^2$$
$$\sigma_z = 4y^2 - z^3$$
$$\tau_{xy} = 5z + 2y^2$$
$$\tau_{xz} = xz^3 + x^2y$$
$$\tau_{yz} = 0$$

Q.2(A) (i)Discuss polynomial solution for two dimensional problems. 6M

(ii)Mention the limitations of polynomial solutions. 6M

OR

Q.2(B) (i)Discuss various applications of polar coordinates and advantages of considering problem using polar Coordinates. 6M

(ii) Explain about Strain components in polar co-ordinates. 6M

Q.3(A) Derive expression for Equations of equilibrium in three dimensions? 12M

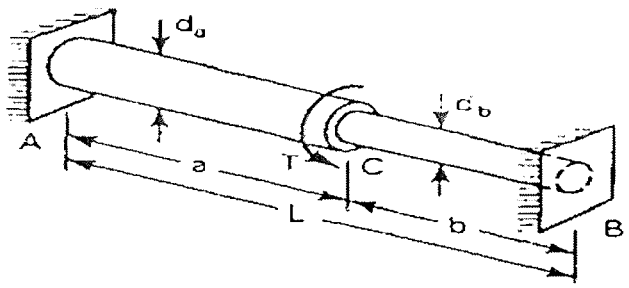
OR

Q.3(B) Derive the expression for strain at a point in case of a body stressed in three dimensions. 12M

Q.4(A) Derive the expression for the torsion of Elliptic cross section. 12M

OR

Q.4(B) A solid circular shaft AB is fixed to rigid walls at both ends and subjected to a torque T at section C as shown in the figure. The shaft diameters are d_a and d_b for segments AC and CB, respectively. Determine the lengths a and b if the maximum shearing stress in both shaft segments is to be the same, for d_a = 20mm, d_b = 12 mm, and L =600 mm. 12M



Q.5(A)	(i)What do you mean by Plasticity? List the Assumptions made in Plastic Analysis?	6M
	(ii)Write short notes on Strain Hardening	6M
	OR	
Q.5(B)	Write short notes on following theories of failure (a) Total strain energy per unit volume (Haigh) Theory (b) Shear strain energy per unit volume Theory (Von Mises &Hencky)	12M

*****END*****

Hall Ticket No: | | | | | | | | | | | Course Code: 18SEP403

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

M.Tech I Year I Semester (R18) Regular End Semester Examinations – January 2019

THEORY AND APPLICATION OF CEMENT COMPOSITES

(Structural Engineering)

Time: 3Hrs **Max Marks: 50**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part A or Part B only.

Q.1(A)	What are the classification and characteristics of composite materials?	12M
	OR	
Q.1(B)	Briefly Explain the basic terminologies of Laminae and Laminate	12M
Q.2(A)	What are the different approaches to stiffness? Explain Elasticity approach to stiffness	12M
	OR	
Q.2(B)	Briefly explain lower bound and upper bound on apparent young's modulus	12M
Q.3(A)	(i))What are the different types of cement Composites? (ii) What do you mean by Curing? What are objectives of curing?	6M 6M
	OR	
Q.3(B)	What is SIFCON? Write down its advantages and applications	12M
Q.4(A)	Explain the behavior of fibre reinforced concrete in tension and compression	12M
	OR	
Q.4(B)	Explain the behavior of ferrocement in flexure and shear	12M
Q.5(A)	What is Fibre Reinforced concrete? Write its applications	12M
	OR	
Q.5(B)	Explain the design of cement-based composites	12M

*****END*****

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MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

M.Tech I Year I Semester (R18) Regular End Semester Examinations – January 2019

DESIGN OF MASONRY STRUCTURES

(Structural Engineering)

Time: 3Hrs **Max Marks: 50**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part A or Part B only. Use of IS CODE 1905 is permitted

Q.1(A)	Explain qualities of good building stones with required standard values	10M
	OR	
Q.1(B)	Discuss different types of classifications of bricks based on compressive strength and water absorptions.	10M
Q.2(A)	What are the stability conditions for wall as per IS 1905 subjected to a) Vertical and lateral load b) Load bearing building upto five storeys.	10M
	OR	
Q.2(B)	Write short notes on the following: a) Slenderness ratio b) Effective height of wall c) Effective length of wall d) Effective thickness of wall	10M
Q.3(A)	A 30 cm thick masonry wall of multistoried building is supported by 15 cm thick RCC slab at its top and bottom, and carries an axial load of 150 Kn/m at the base. The length of wall is 3.2 m in between cross wall. The wall is continuous beyond the two cross walls. The clear height of storey is 3 m. Determine the required crushing strength of bricks and the type of mortar used.	10M
	OR	
Q.3(B)	A 20 cm thick brick wall carries an axial load of 55 Kn/m from wall above it and an eccentric load of 45 kn/m from RCC floor slab acting at a distance of 4 cm from the centre of the wall. Determine the equivalent eccentricity and stress in the wall. What will be the maximum compressive stress in wall if axial load is 30 Kn/m and eccentric load is 60 Kn/m for an eccentricity 5 cm.	10M
Q.4(A)	Design an interior cross wall (with self weight of wall) of two storyed buildings to carry 100 mm thick RCC slab with 3 m celling height. The wall is unstiffened and its support 2.65 m wide slab. Live load on roof and floor are 1.5 Kn/m^2 and 2 Kn/m^2 respectively. Weight of waterproof coat on terrace is 1.96 Kn/m^2. Take weight of floor finish is 0.2 Kn/m^2.	10M
	OR	

Q.4(B)	Design a Unstiffened solid brick masonry wall for 3 storyed building for following data Maximum span of slab = 3.6 m, Clear height of storey = 2.7 m, Height of plinth above foundations = 0.6 m, Thickness of Roof/ Floor slab = 120 mm, Thickness of lime concrete cover on roof slab = 100 mm, Thickness of floor finish = 40 mm,	10M

Q.5(A)	Write short notes on the following: a) Reinforced masonry b) Shear wall c) Infilled frame d) Bare frame	10M
	OR	
Q.5(B)	Explain different types of modes of failure in infilled frame with sketches.	10M

END

Hall Ticket No: | | | | | | | | | | | Course Code: 18RMP101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

M.Tech I Year I Semester (R18) Regular End Semester Examinations – January 2019

RESEARCH METHODOLOGY AND IPR

(Common to ALL)

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part A or Part B only.

Q.1(A)	List the objectives of research and briefly explain any two of your choice.	12M
	OR	
Q.1(B)	Explain fundamental research and applied research with suitable examples pertaining to them?	12M
Q.2(A)	How good research paper can be written and elements of information needed?	12M
	OR	
Q.2(B)	Discuss briefly about the investigation of a research problem?	12M
Q.3(A)	You are one of the evaluators for a thesis or research paper. How you will do review of the same?	12M
	OR	
Q.3(B)	Describe the steps involved in successful technology licensing?	12M
Q.4(A)	Describe briefly the steps involved in patenting process in India.	12M
	OR	
Q.4(B)	Describe shortly the terms listed below: a. Patents b. Copyright c. Plagiarism	12M
Q.5(A)	Write a short note on Nagoya protocol?	12M
	OR	
Q.5(B)	Describe briefly the contents of patent application form.	12M

END