Sanjay Ghodawat University, Kolhapur

2018-19
EXM/P/09/00

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

Year and Program M.TECH. Structures 2018-19 | **School of Technology** | **Department Civil Engineering**

Course Code CSE 504 | **Course Title** FINITE ELEMENT METHOD | **Semester – II**

Day and Date: Wednesday 22nd May 2019 | **Examination: ESE** | **Time:** 2:30 to 5:30 PM **Max Marks: 100**

Instructions: 1)All questions Compulsory.
2)Figure to the right indicate full mark.
3)Draw sketches wherever necessary.
4)Assume suitable data if require

Que		Marks	Blooms level	CO
1	For spring assembly loaded as shown in fig, Find (i) Assembled stiffness matrix (ii) Reactions at Node 1 &4	10	L4	1

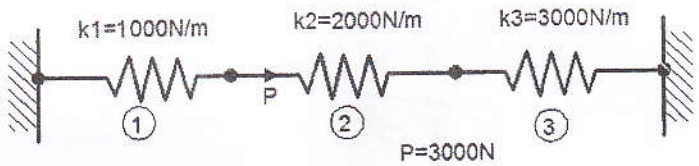

Fig. 1

OR

	A simply supported beam of span L is subjected to UDL q/m. Determine the deflection at centre of span by Gelerkin weighted residual Approach.	10	L4	1
2	Derive [k] for CST Element starting from first principle.	10	L2	2

OR

	Explain the convergence and compatibility requirement for a finite displacement model.	10	L2	2
3	What is Axisymetric problem? Explain procedure to formulate [k] for any one axisymmetric element.	10	L2	3
4	Evaluate the integral $I=\int_{-1}^{1} 2x^3+4x^2+[3/(x+6)]\,dx$ using one and two Gauss points.	10	L3	4

OR

	Explain natural coordinate system. How will you relate it with Cartesian coordinate system? Explain with help of example.	10	L3	4

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(1)

5		**Solve any two of the following.**			
	a	Describe in brief the various types of plate elements used in plate bending analysis.	**15**	**L4**	**5**
	b	Discuss ACM element and write down detailed procedure to obtain [k] for ACM element.	**15**	**L4**	**5**
	c	What is different type of shell elements? Explain the element stiffness formulation procedure for shell triangular element.	**15**	**L4**	**5**
6		**Solve any two of following.**			
	a	Determine element mass matrix for CST element.	**15**	**L4**	**6**
	b	State Hamilton's principle for Linear elastic body. Explain with suitable example how the consistent mass matrix is formulated by using Hamilton's principle	**15**	**L4**	**6**
	c	Determine consistent mass matrix and lumped mass matrix for axial vibration of a uniform bar finite element with 3 nodes and quadratic displacement.	**15**	**L4**	**6**

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