

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

M.Tech-I Semester (SE)

COURSE CODE (CREDITS): 13M1WCE131(3)

MAX. MARKS: 25

COURSE NAME: FINITE ELEMENT METHODS

COURSE INSTRUCTORS: DR. SAURAV

MAX. TIME: 1 Hour 30 Minutes

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	Using Various examples define different coordinate systems used in Finite elements methods. Establish a relation for evaluate Natural Coordinates in 1-D. Also draw its graphical variation.	CO-3	5
Q2	Explain shape functions. Describe the shape function equation for 3 noded Triangular elements.	CO-3	5
Q3.	Using polynomial functions (generalized coordinates) determine shape functions for a two noded beam element.	CO-2	5
Q4.	Using Lagrange polynomial evaluate shape function for three noded bar element.	CO-2	2
Q5.	Using serendipity concept solve quadratic serendipity family members and evaluate its shape functions	CO-3	5
Q6.	i) Evaluate closed form integration $\int_0^l L_1^3 L_2 dx$ over entire length for 1-D line element. ii) Evaluate closed form integration $\oint 2 L_1^2 L_2^2 L_3^3 dA$ over entire area for 2-D triangular element	CO-3	3