

9. If the plate thickness to span ratio is less than $1/10$ then it is called as _____ CO5 [K₁]
 a) Thin plate with small deformation b) Thin plate with large deformation
 c) Thick plate d) Moderately thick plate
10. Arrange the Following Steps in the Finite Element Analysis of Thin Plates in Correct Sequence CO5 [K₂]
 i) Define material properties.
 ii) Apply boundary conditions.
 iii) Postprocess results for analysis.
 iv) Generate mesh.
 v) Solve for displacements and stresses
- a) iv-i-ii-v-iii b) ii-i-iv-v-iii
 c) i-ii-iv-v-iii d) i-ii-v-iv-iii

PART B (10 x 2 = 20 Marks)

11. Write the applications of finite element method. CO1 [K₁]
 12. Mention the basic steps involved in galerkins methods. CO1 [K₁]
 13. What is the purpose of isoparametric elements? CO2 [K₁]
 14. What are the properties of stiffness matrix? CO2 [K₁]
 15. What do you mean by higher order element? CO3 [K₂]
 16. What are the applications of axisymmetric formulation? CO3 [K₁]
 17. List out the assumptions made in the derivation of stiffness beam Element. CO4 [K₂]
 18. What are the ways in which 3D problem can be reduced to a 2D approach? CO4 [K₁]
 19. What are the assumptions used in thin plate elements? CO5 [K₁]
 20. Distinguish between plate and shell elements. CO5 [K₂]

PART C (10 x 5 = 50 Marks)

21. Discuss the concepts of FEA. List out the errors and accuracy in FEA. CO1 [K₂]
 22. List and briefly describe the basic steps in finite element analysis. CO1 [K₂]
 23. Explain the isoparametric elements and its types. CO2 [K₂]
 24. Derive shape functions for a 2D rectangular element. CO2 [K₃]
 25. Show the stiffness matrix for an axisymmetric triangular element. CO3 [K₃]
 26. Derive the stiffness matrix for a 2D rectangular element CO3 [K₃]
 27. Derive the strain-displacement matrix for CST element CO4 [K₃]

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| 28. Discuss the applications where axisymmetric elements can be used. | CO4 | [K ₂] |
| 29. Explain in detail the finite element analysis of skew plate. | CO5 | [K ₂] |
| 30. Write down the assumptions of thin plate and thick plate theory. | CO5 | [K ₂] |

Answer any TWO Questions

PART D (2 x 10 = 20 Marks)

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| 31. Discuss the advantages, disadvantages and applications of Finite Element Method. | CO1 | [K ₂] |
| 32. Explain Constant strain triangle and Linear strain triangle with a neat sketch. | CO3 | [K ₂] |
| 33. Explain in detail the basic relationships and consecutive equations of thin plate theory. | CO5 | [K ₂] |
