

Enrollment No.

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M.TECH (SE)
I YEAR II SEMESTER EXAMINATION
ADVANCED DESIGN OF FOUNDATION

[Time : 3:00 Hours]

[Max. Marks : 70]

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS
CALCULATOR IS ALLOWED (100 MS)

QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.

(4*3=12)

a)	What is an influence diagram? What is its use in practice?
b)	What are the assumptions made in the derivation of terzaghi's bearing capacity theory? Write the equations for the ultimate bearing capacity.
c)	What are the conditions where a pile foundation is more suitable than a shallow foundation?
d)	What is negative skin friction? What is its effect on the pile?
e)	Discuss the method for the design of tension piles and inclined piles.
f)	Discuss the situation where a well foundation is more suitable than the other types of foundations.

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

a)	Discuss the use of single degree freedom system in the analysis of machine foundation.
b)	What is meant by vibration isolation? How is it done?
c)	Give the explanation of expansion of soil in brief?
d)	Describe the procedure for constructions of wells? Discuss the causes and remedies for tilts and shifts.

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

a)	What is dynamic formula discuss it and write their limitations.
b)	The load carrying capacity of tension piles depends upon the diameter of the bell explain this statement
c)	Describe about well sinking? What are the measures employed in controlling well sinking.
d)	Discuss on under reamed pile foundations with proper diagram?

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

a)	Describe the method of calculating the stress at a point below the corner of a rectangular load.
b)	What do you understand by contact pressure? What are the factors that affect the contact pressure distributions?
c)	How would you determine the stress at appoint due to strip load and circular load. Compare the zones of influence due to the two types of loads

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

a)	Determine the allowable gross load and the net allowable load for square footings of 2m side and with a depth of foundation of 1.0m. Use terzaghi's theory and assume local shear failure. Take a factor of safety of 3.0. The soil at the site has $Y = 18\text{KN/m}^3$, $C = 15\text{KN/m}^2$ and angle $= 25^\circ$.
b)	What are the different types of shallow foundation? Explain with the help of sketches.
c)	How would you estimate group action capacity of piles in a) Sand b) Clay.

[illegible]

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS

(2*7=14)

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M.TECH (SE)
I YEAR II SEMESTER EXAMINATION
STRUCTURAL DYNAMICS

[Time : 3:00 Hours]

[Max. Marks : 70]

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS**QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.**

(4*3=12)

a)	Define vibration analysis and explain its importance in engineering applications.
b)	What are the different types of exciting forces in dynamic systems?
c)	State the basic principle of free vibration in a Single Degree of Freedom (SDOF) system.
d)	Explain the concept of damping and its effects on the response of a system.
e)	Write the expression for the response of a Single Degree of Freedom system to harmonic loading.
f)	What is Duhamel's Integral? How is it used to find the response of a system to dynamic loading?

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

a)	Explain the mathematical modeling of dynamic systems and how it helps in vibration analysis.
b)	Discuss the difference between free and forced vibrations in the context of Single Degree of Freedom systems.
c)	Derive the equation of motion for a Single Degree of Freedom system with damping and explain its significance.
d)	Explain the Fourier Analysis method and its application in solving periodic loading problems.

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

a)	Explain the concept of the State Space solution for the response of a Single Degree of Freedom system. Derive the state space equations.
b)	Describe the Newmark method and Wilson method for numerical solution of dynamic systems. Provide the steps involved in these methods.
c)	Explain the Modal Superposition Method for solving the dynamic response of a Multiple Degree of Freedom system.
d)	Explain the concept of the State Space solution for the response of a Single Degree of Freedom system. Derive the state space equations.

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

a)	Discuss the Inverse Iteration Method used for the determination of natural frequencies and mode shapes in a Multiple Degree of Freedom system.
b)	What is the procedure for direct integration of the equation of motion in a Multiple Degree of Freedom system? Explain with an example.
c)	Explain the free and forced vibration of a Single Span Beam. How are they analyzed using the concepts of Multiple Degree of Freedom systems?

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

a)	Describe the concept of dynamic effects caused by wind loading and how it influences structural design.
b)	Discuss the impact of moving loads on structural vibration and the methods used to analyze such effects.
c)	Explain the concept of base isolation in structural dynamics and its applications in mitigating vibrations from external sources such as traffic or earthquakes.

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(A) (SVSU) : 2024-2025/R

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M.TECH (SE)
I YEAR II SEMESTER EXAMINATION
ENGLISH FOR RESEARCH PAPER WRITING

[Time : 3:00 Hours]

[Max. Marks : 70]

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS**QUESTION NO.-1: ATTEMPT ANY TWO PARTS.****(2*7=14)**

a)	What are the key components of a well-structured literature review, and how do they support your research argument?
b)	What should be included in a structured abstract?
c)	What are the dangers of plagiarism and how can paraphrasing help avoid it?

QUESTION NO.-2: ATTEMPT ANY TWO PARTS.**(2*7=14)**

a)	What are ethical considerations when attributing previous work in your writing?
b)	What are common examples of redundant phrases in research writing?
c)	Why is planning important before starting to write a research paper?

QUESTION NO.-3: ATTEMPT ANY TWO PARTS.**(2*7=14)**

a)	Why is precision important in reporting research findings?
b)	How can you write an engaging and informative Introduction section?
c)	How can visual aids (tables, charts) be used effectively in the Results section?

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.**(2*7=14)**

a)	What are the key features of a strong Discussion section?
b)	What techniques help in breaking up overly long sentences?
c)	What writing skills help in organizing a Literature Review effectively?

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.**(2*7=14)**

a)	What causes ambiguity in academic writing?
b)	What are the main purposes of the Literature Review in a research paper?
c)	How can the Conclusion offer practical or theoretical implications of your study?

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M.TECH (SE)
I YEAR II SEMESTER EXAMINATION
FEM IN STRUCTURAL ENGINEERING

[Time : 3:00 Hours]

[Max. Marks : 70]

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS**QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.**

(4*3=12)

a)	What is meant by plane stress analysis? Give examples.
b)	What is a Jacobian transformation?
c)	What types of problems are treated as one-dimensional problems?
d)	Mention the basic steps of Rayleigh-Ritz method
e)	What are shape functions and what are their properties?
f)	State the conditions to be satisfied in order to use axisymmetric elements

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

a)	Explain steps in Gauss elimination solution procedure.
b)	Discuss role of shape functions, their significance and properties in FEM.
c)	Differentiate between local and global coordinates?
d)	Write the advantages, disadvantages and applications of FEM?

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

a)	Derive the strain displacement relation for a 2 dimensional element?
b)	Define shape function? Derive shape function in terms of Cartesian coordinates?
c)	Describe patch test and mention its importance.
d)	Explain different plate bending theories with elements used for each.

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

a)	Explain in detail about the requirement of convergence in Finite Element Methods
b)	Derive 2-noded beam element and 3-noded bar element using interpolation functions.
c)	Derive the element stiffness matrix for spring element.

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

a)	Explain the step by step procedure of FEA
b)	Write the properties of stiffness matrix.
c)	Write down the expression for the stress-strain relationship matrix for a CST element.
