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B.Tech. (Civil Engineering) 8th Semester

(G-Scheme) Examination, May-2024

Estimating, Costing and Valuation

Paper : PCC-CE-402G

Time allowed : 3hours]

[Maximum marks : 75

Note: Question No. 1 is compulsory. Attempt one question from each section. All questions carry equal marks. Assume missing data, if any suitably.

1. (a) Different types of specifications and their uses
- (b) Traditional and modular materials
- (c) Factors affecting rate analysis
- (d) Administrative sanction
- (e) Preparation of pay bill
- (f) Lease hold and free hold property 15

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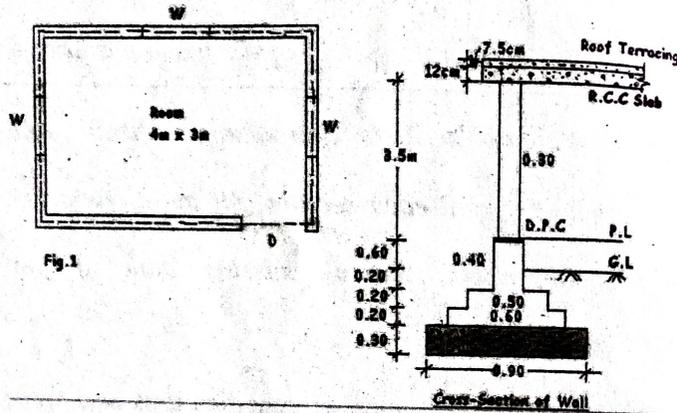
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Section-A

2. (a) Calculate the details of measurement and quantity of one room of given figure by using any method : 10



- (b) What are methods used for calculating the earthwork in case of canals and dams ? 5
3. (a) What is the principle of estimation ? Described the different methods of preparing estimate. 8
- (b) What are the methods adopted to Calculate Earthwork of Roads ? Explain with Sketches. 7

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Section-B

- (a) Describe the general specification of Ist class and IInd class building. 8
- (b) Describe the detailed specifications of R.C.C Slab (1:2:4), D.P.C (1:1.5:3) and painting. 7
5. (a) Describe the advantages and disadvantages of open and closed specification. 8
- (b) What do you mean by market survey of construction materials ? Describe in detail. 7

Section-C

6. (a) What is rate analysis ? Describe the importance and requirement of rate analysis. 8
- (b) Determine the rate for a wall of 30 m length, 5 m height and 30 cm nominal thickness. 7

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7. (a) Describe the procedure of rate analysis for R.C.C. work and plastering.
- (b) What is Muster Roll ? What are the rules for writing muster roll ? Give common irregularities which may occur in the maintenance of muster roll.

Section-D

8. (a) What are the different methods of valuation of a building ? Explain each in detail.
- (b) Explain the rental-return method of valuation in detail.
9. (a) What are the different types of contracts ? Briefly describe the advantages and disadvantages of these contracts.
- (b) Describe the following :
- (i) Different types of payments
 - (ii) Earnest, security and retention money

B. Tech. (Civil Engineering) 8th Semester,
(G-Scheme) Examination, May-2024

GEOTECHNOLOGY

Paper-PEC-CEEL-408-G

Time allowed : 3 hours]

[Maximum marks : 75

Note : Question number 1 is compulsory Attempt one question from each section. All question carry equal marks. Assume missing data, if any, suitably.

- (a) Causes of failure of slopes
- (b) Factors affecting slope stability
- (c) Necessity of sheeting and bracing system
- (d) Purposes of sheet piles
- (e) Characteristic elements of a vibratory system
- (f) Dynamic compaction 15

Section-A

- (a) What do you mean by infinite slope? Derive an expression for the factor of safety of an infinite slope in a cohesionless soil. 7
- (b) What is Taylor's stability number? Explain its utility in the analysis of stability of slopes. 8

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3. (a) Explain the procedure for stability analysis of finite slopes using method of slices. 7.
- (b) Describe with neat sketch the Fellenius method to locate centre of most critical slip circle.

Section-B

4. (a) What is bracing system? Describe the different components of bracing system. 8.
- (b) Draw different types of apparent pressure diagrams used in braced cuts. What are the factors that affect the pressure distribution?
5. (a) What are the different types of coffer dam? Explain with their advantages and disadvantages. 9.
- (b) Describe the design criteria of cellular coffer dam on soil. 8

Section-C

6. (a) What is sheet pile? Differentiate between cantilever and anchored sheet pile. 7
- (b) Derive an expression for depth of embedment of cantilever sheet pile in cohesionless soil using

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An anchored sheet pile retains soil to a height of 8 m. Determine the depth of embedment for anchored sheet pile with fixed earth support method if $\Phi = 30^\circ$, $\gamma = 19 \text{ kN/m}^3$. Also determine the anchor force per unit length. 15

Section-D

- (a) Explain the general criteria for satisfactory action of a machine foundation. 7
- (b) What is Barken's soil spring constant? Explain Barken's method for determining the natural frequency of a block foundation subjected to vertical oscillations. 8

9. Write short note on the following :

- (a) Lime and cement stabilization
- (b) Grouting and reinforced earth
- (c) Stabilization using stone column and its advantages

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B.Tech. 8th Semester (Civil Engineering)

(G-Scheme) Examination, May-2024

ADVANCED STRUCTURE ANALYSIS

Paper : PEC-CEEL-410 G

Time allowed : 3 hours]

[Maximum marks : 75

Note: Attempt five questions in total, first being compulsory and selecting one question from each section. Assume missing data, if any, suitably.

1. (a) What do you understand by the term 'energy' ? Explain the various of mechanical energies.
- (b) What are the differences between static and kinematic indeterminacies ? Explain them with examples.
- (c) Enlist specific design codes or guidelines that address the analysis and design of members with partial discontinuities.
- (d) What are the limitations or challenges associated with implementing the sub-structure technique in structural analysis ?

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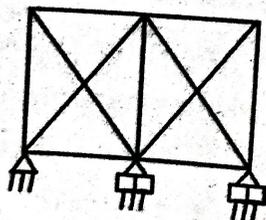
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- (e) Write practical applications or engineering structures where the analysis of semi-circular beams is particularly important ?
- (f) What is element load vector ? $6 \times 2.5 = 15$

Section-A

- 2. (a) State the principle of virtual work, and explain how it can be used for solving problems in statics. 7
- (b) A spring is stretched by 50 mm by the application of a force. Find the work done, if the force required to stretch 1 mm of the spring is 10 N. 8
- 3. (a) State and prove the expression for Castigliano's first theorem. 10
- (b) Calculate the degree of redundancy and degree of freedom for Figure : 5



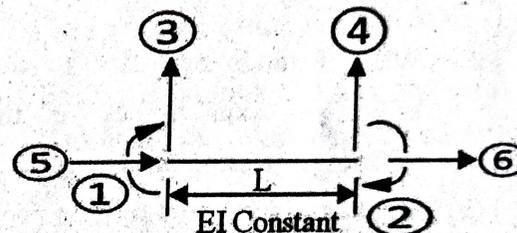
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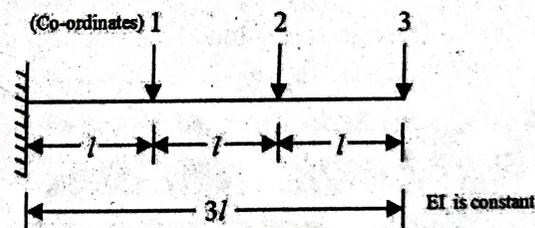
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Section-B

- (a) Discuss various steps involved while analyzing structures using Stiffness method. 8
- (b) Develop the stiffness matrix for the end-loaded prismatic member AB with reference to the Coordinates shown in Figure : 7



- (a) Develop the flexibility matrix for the cantilever with coordinates as shown in Figure : 10



- (b) Write short note on Analysis of 2D frames using flexibility matrix. 5

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Section-C

6. (a) What are partial discontinuities in a member, and how do they affect structural behavior?
- (b) How do partial discontinuities impact load distribution and stress concentration within a member?
7. (a) What methods are used to quantify the effects of axial forces on the flexural stiffness of a structure?
- (b) Explain the step-by-step process of conducting structure analysis using the superposition structure technique.

Section-D

8. (a) Describe the load distribution and stress patterns in a semi-circular beam under a uniformly distributed load.
- (b) Explain the concept of torsion factor and its significance in the analysis of curved beams.
9. How do computer programs for matrix structural analysis streamline the modeling and analysis process compared to manual methods?

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B. Tech. (Civil Engg.) 8th Semester (G-Scheme)

Examination, May-2024

STRUCTURAL DYNAMICS

Paper-PEC-CEEL-414G

Time allowed : 3 hours]

[Maximum marks : 75

- Note :*
- (i) Question No. 1 is compulsory.*
 - (ii) Each question carries equal marks (15 marks).*
 - (iii) Students have to attempt five questions in total at least one question from each section.*

1.
 - (a) Briefly explain oscillatory motion.
 - (b) Explain about lumped mass and continuous mass system.
 - (c) Define stiffness and damping.
 - (d) What is Rayleigh's quotient?
 - (e) Explain simple harmonic motion.
 - (f) Discuss various types of earthquake excitation.

6×2.5=15

Section-A

2.
 - (a) Briefly explain fundamental objectives of dynamic analysis with examples. 7.5
 - (b) Explain D'Alemberts principle. 7.5
3.
 - (a) Define logarithmic decrement and derive an expression for logarithmic decrement. 7.5

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- (b) An SDOF system of mass m & stiffness K is found to vibrate with a period of 0.12sec. When the mass is increased by 3kg, the period recorded is 0.135sec. Determine mass and stiffness for original system.

Section-B

4. Derive an expression for Duhamel's Integral in respect of SDOF system to general dynamic loading.
5. (a) Explain the concept of a shear building model for the analysis of a multistoried building frame.
- (b) Explain the orthogonal properties of the normal modes.

Section-C

6. Derive the formula for Damping ratio & Frequency ratio for undamped single degree of freedom system with forced vibration.
7. Derive an equation of damped motion of shear building. Explain consistent and lumped mass matrices.

Section-D

8. Derive the natural frequency and mode shapes for uniform beam both end simply supported.
9. Discuss lumped SDOF elastic system. Also discuss various distributed parameter for elastic system.
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B. Tech. (Civil Engineering) 8th Semester
(G-Scheme) Examination, May-2024

SOLID AND HAZARDOUS WASTE MANAGEMENT

Paper-OEC-CE-416G

Time allowed : 3 hours]

[Maximum marks : 75

Note : Question No. 1 is compulsory. Attempt one question from each section. All questions carry equal marks. Assume missing data, if any suitably.

- (a) Discuss the necessity of solid waste management.
- (b) What are the potential health effects associated with exposure to nuclear waste?
- (c) What type of solid waste need the transfer and why?
- (d) Highlight the steps involved in biogas generation.
- (e) State the factors governing the selection of landfills.
- (f) Enumerate the means to handle hazardous waste.

$6 \times 2.5 = 15$

Section-A

- (a) Are there regional or demographic variations in the composition and properties of municipal solid waste, and if so, how do they influence waste management practices? 8

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(b) How is the composition of solid waste characterized, and what methodologies are commonly used to determine it?

3. (a) Discuss in detail about the factors affecting solid waste generation rates.

(b) What are the key metrics used to quantify solid waste generation and how do they differ in terms of accuracy and reliability?

Section-B

4. (a) How do commercial and industrial sites differ in their approaches to waste handling and material separation compared to residential areas?

(b) What are the primary methods employed for material separation at waste processing sites? Explain in detail.

5. (a) What is involved in the planning process for establishing a new landfill site, and what criteria are considered in selecting suitable locations?

(b) What measures are implemented to mitigate potential environmental risks associated with landfill operations, such as groundwater contamination and air emissions?

Section-C

6. (a) What factors are considered during site assessments for hazardous waste disposal or treatment facilities, and how are potential risks evaluated? 8

(b) How is hazardous solid waste identified and classified and what criteria are typically used in this process? 7

7. (a) How does anaerobic decomposition of solid waste differ from aerobic decomposition and what are the main factors influencing the effectiveness of anaerobic processes? 8

(b) What are the key principles and processes involved in composting organic waste and how does it contribute to waste management and environmental sustainability? 7

Section-D

8. (a) What are the potential environmental impacts of radioactive waste disposal and how can these impacts be mitigated or minimized through proper waste management practices? 8

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- (b) Discuss about primary sources of radioactive waste and how do they vary in terms of composition and radioactivity levels?
9. (a) Describe the composition of e-waste and highlight the various components typically found in electronic products?
- (b) How is e-waste managed at different stages of its lifecycle.