NATIONAL INSTITUTE OF TECHNOLOGY PATNA
Department of Civil Engineering
End Semester Examination Jan-June 2024

Course: B. Arch.
Semester: IV
Max. Time: 3Hrs

Subject: Building Structure I
Course Code: AR41132
Max. Marks: 60

Note: Attempt all questions. Each question carries equal marks.

1. Derived the equation for the deflection profile of the beam shown in **Figure 1** using elastic method.
2. Draw shear force diagram and Bending moment diagram for the beams shown in **Figure 2.**
3. Find the maximum and minimum bending stresses in the beam shown in **Figure 3**. The cross-section geometry of the beam is also shown in **Figure 3**.
4. Write the assumption of simple bending theory. Derived the equation for the simple bending theory.
5. Find the maximum deflection in the beam shown in **Figure 4** using the energy method.

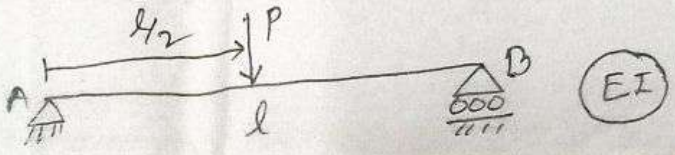


Figure 1.

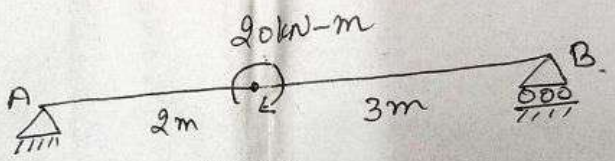


Figure 2.

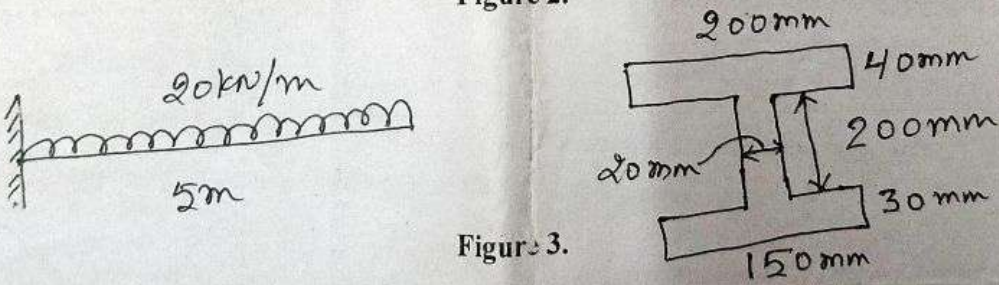


Figure 3.

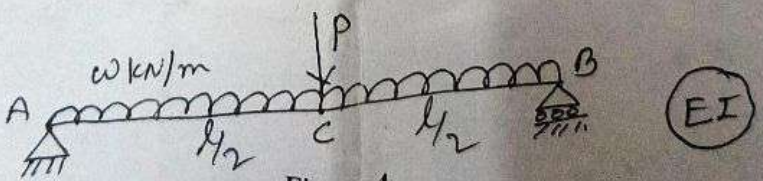


Figure 4.

Roll No. .....

Name of the student.....

NATIONAL INSTITUTE OF TECHNOLOGY PATNA
DEPARTMENT OF ARCHITECTURE AND PLANNING
END TERM EXAM MAY 2024

Course: B.Arch.
Semester: IV

Subject: Architectural Design & Field Study-III
Subject Code: AR4112
Max Marks: 60 Marks

Date:
Time: 3 Hrs.

Instructions:
- *USE TRACING SHEET FOR CONCEPT AND CATRAGE SHEET FOR FINAL DRAWING.*
- *ALL DRAWINGS SHOULD BE WELL DIMENSIONS.*
- *DRAWING SHOULD BE IN MENTIONED SCALE ONLY.*
- *ATTEMPT ALL THE QUESTIONS.*

Design Project: NIT Canteen

Design Brief for NIT Canteen

NIT Canteen aims to create a unique dining experience that blends modern aesthetics with elements of traditional cuisine. It targets a diverse client ranging from students, faculties, and visitors.

Requirement:

1. Ambiance: The NIT Canteen should exude an inviting and comfortable atmosphere that reflects the theme of the cuisine. Lighting should be adjustable to create different moods throughout the day.

2. Seating Capacity: The design should accommodate approximately 50-60 guests, including options for intimate dining as well as larger groups.

3. Kitchen Layout: The kitchen should be efficiently organized to support the preparation of a variety of dishes while maintaining cleanliness and safety standards. Consideration should be given to workflow and equipment placement.

4. Accessibility: The NIT Canteen should be accessible to individuals with disabilities, including wheelchair users. This includes ramps, wide doorways, and accessible restroom facilities.

6. Outdoor Space: If feasible, incorporate outdoor seating options to take advantage of pleasant weather and enhance the dining experience.

Design Concepts:

1. Fusion of Modern and Traditional Elements: Incorporate elements of traditional cuisine into the design, such as artwork, materials, and decor, while maintaining a sleek and contemporary overall aesthetic.

Roll No. 2205014

Name of the student. Reuga Ranjan

2. Natural Materials: Utilize natural materials such as wood, stone, and bamboo to create a warm and inviting atmosphere.

3. Flexible Seating Arrangements: Design the space to accommodate both small and large groups, with options for private dining areas or semi-private booths.

4. Open Kitchen Concept: Consider incorporating an open kitchen layout to allow guests to observe the culinary process and enhance the dining experience.

5. Lighting Design: Implement a lighting scheme that can be adjusted to create different atmospheres throughout the day, from bright and energetic during lunch service to soft and intimate in the evening.

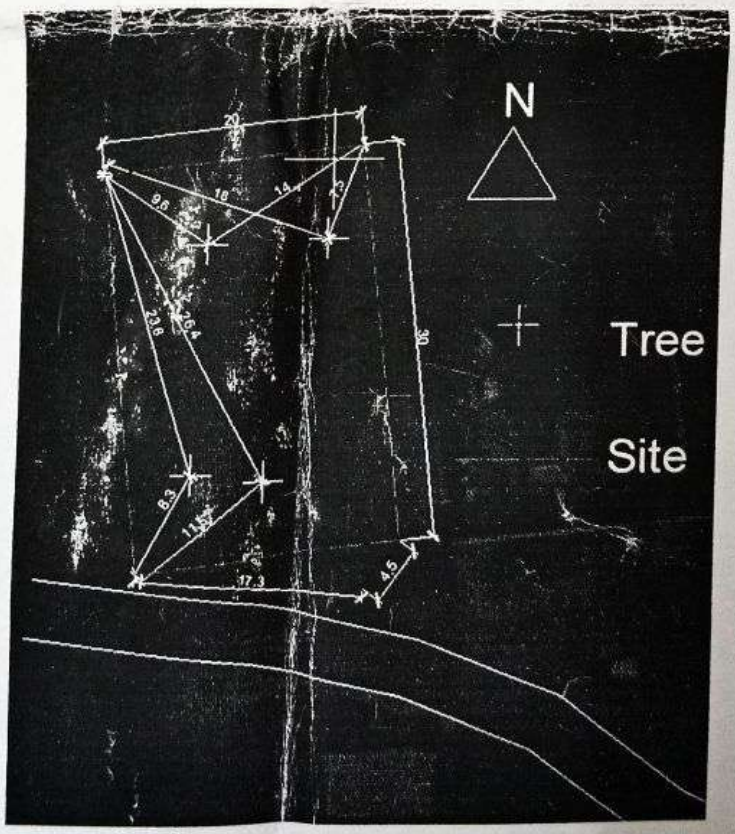
6. Sustainability: Integrate sustainable design practices where possible, such as energy-efficient lighting, eco-friendly materials, and waste reduction strategies.

Plot Size: 30m X 20m

Drawing Requirement:

1. Concept behind the Design (1:100). and site plan — 20 Marks
2. Conceptual all Floor Plan (1:100). — 20 Marks
3. ~~conceptual elevations~~ view elevation and section (1:100). — 20 Marks

Donot Cut existing tree.



*****Good Luck*****

NATIONAL INSTITUTE OF TECHNOLOGY, PATNA
Ashok Rajpath, Patna

End-Sem Examination, Jan-June 2024

Time Allotted: 3 hrs.
Max Marks: 60

Course Code: AR41131
Course Title: Building Services-I

Instructions: Answer ANY SIX questions.

Q.1 Explain the difference between slow sand filter and rapid sand filter. Draw the illustrative diagram for both of them. **[10]**

Q.2 Explain the phenomenon of water hammer. What are the available solutions for it in the market? **[10]**

Q.3 Explain municipal water connection at household level. What are its various components? Explain with detailed plan and section. **[10]**

Q.4 What is the difference between combined sewerage system and partially separate sewerage system? Explain the advantages and disadvantages of each system. **[10]**

Q.5 Compare and contrast the direct water supply system and Overhead tank type indirect water supply system. Support the answer with single line diagram for each system. **[10]**

Q.6 Define the following: **[10]**

a. Sewage
b. Sewerage
c. Sewer
d. Storm water drain
e. Sullage

Q.7 Define the following: **[10]**

a. Soil pipe
b. Waste pipe
c. Vent pipe
d. Rain water pipe
e. Anti-siphonage pipe

Q.8 Discuss the significance of traps in water supply system. Categorize and describe the different types of traps used for different functions. **[10]**

Q.9 Differentiate between Stack system and Two-pipe system for drainage work in a residential building. Draw a single line diagram for the same. **[10]**

Q.10 Explain in detail municipal waste water treatment system. What are the methods used in Primary treatment and Secondary treatment? Support with an illustrative sketch. **[10]**