

6E1541**6E1541**

B.Tech. VI Sem. (Main/Back) Examination, June - 2022
Civil Engg.
6CE3-01 Wind And Seismic Analysis

Time : 2 Hours**Maximum Marks : 80****Min. Passing Marks : 28****Instructions to Candidates:**

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination (As mentioned in form No. 205)

PART - A**All questions are compulsory.****(5×2=10)**

1. What are the various types of structures used in structural systems. (2)
2. Explain load flow concept in detail. (2)
3. What do you understand by the term wind load. (2)
4. Write a short note on earthquake loads in detail. (2)
5. Describe in brief seismic analysis. (2)

PART - B**Attempt any four questions****(4×10=40)**

1. Explain objective, scope and outcome of wind and seismic analysis. (10)
2. Differentiate between symmetry and Asymmetry in building forms. Also explain framed tubes and various multistorey configurations. (10)
3. What are the various types of loads used for different types of buildings. (10)
4. Describe the calculation procedure of wind load on flat roof. (10)

5. Write a short note on seismic failure of masonry and RCC structures. (10)

6. Differentiate between pitched roof and single roof buildings in detail? (10)

Part - C

Attempt any two questions. (2×15=30)

1. What is shear wall. Explain its concept of design. Also describe vertical and lateral load resting elements. (15)
2. Describe the calculation procedure of an earthquake loads on framed structures. (15)
3. Explain earthquake resistant construction of buildings in detail. Also write down the various provision as per IS codes. (15)

6E1542**6E1542****B.Tech. VI Sem. (Main/Back) Examination, June - 2022****Civil Engg.****6CE4-02 Structural Analysis - II****Time : 3 Hours****Maximum Marks : 120****Min. Passing Marks : 42****Instructions to Candidates:**

Attempt all ten questions from Part A, five questions out of Seven from Part B and Four questions out of Five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination (As mentioned in form No. 205)

Part - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

Write short notes on following:

1. Influence line.
2. Determinate structure.
3. Redundant Frame.
4. Shear centre.
5. Strain energy for impact loads.
6. Unsymmetrical bending.
7. Cantilever method.
8. Unit load method.
9. Fixed type parabolic arches.
10. Müller Breslau principle.

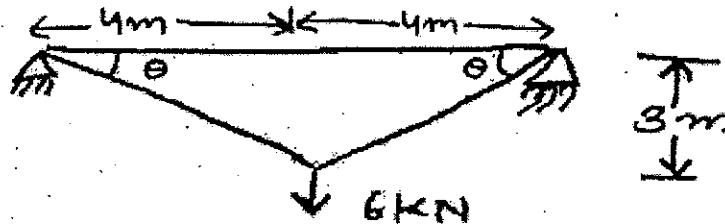
Part - B

(Analytical/Problem solving questions)

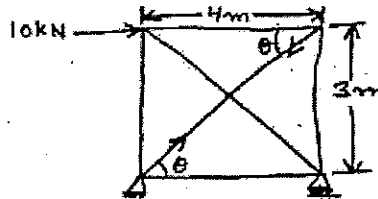
Attempt any five questions.

(5×8=40)

1. Two wheel loads of 16 and 8 kN, at a fixed distance apart of 2m, cross a beam of 10 m span. Draw the influence line for bending moment and shear force for a point 4 m from the left abutment, and find the maximum bending moment and shear force at that point.
2. Determine the vertical and horizontal displacement of the point C of the pin-jointed frame shown in fig. The cross-sectional area of AB is 100 sq.mm and of AC and BC sq mm each $E = 2 \times 10^5 \text{ N/mm}^2$.



3. Find the force in the member BC of the frame loaded as shown in fig. All the members have the same cross sectional area.



4. Explain cantilever method for analysis of multistory frames.
5. A $60 \text{ mm} \times 40 \text{ mm} \times 6 \text{ mm}$ unequal angle is placed with the longer leg vertical and is used as a beam simply supported at the ends, over a span of 2 m. If it carries a uniformly distributed load of such magnitude as to produce the maximum bending moment of 0.12 kN-m determine the maximum deflection of the beam. Take $E = 2.1 \times 10^5 \text{ N/mm}^2$.
6. Derive the expression of three hinged parabolic Arch.
7. A freely supported beam of span L carries a central load W. The sectional area of the beam is so designed that the moment of Inertia of the section increases uniformly from I at ends to 1.5 I at the middle. Calculate the central deflection.

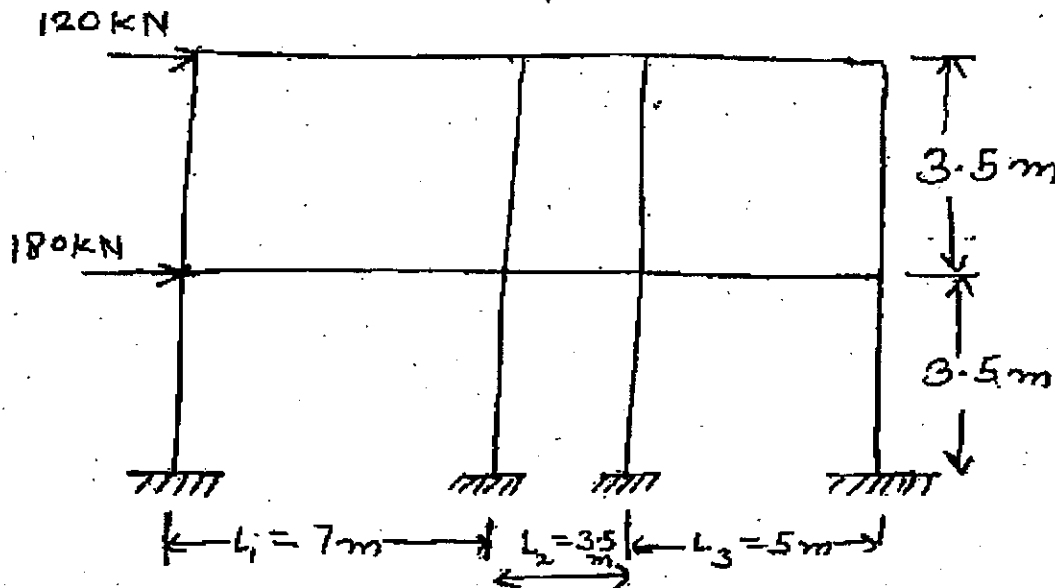
Part - C

(Descriptive/Analytical/Problem Solving/Design questions)

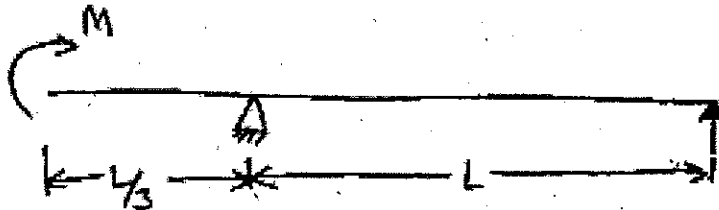
Attempt any **Four** questions.

(4×15=60)

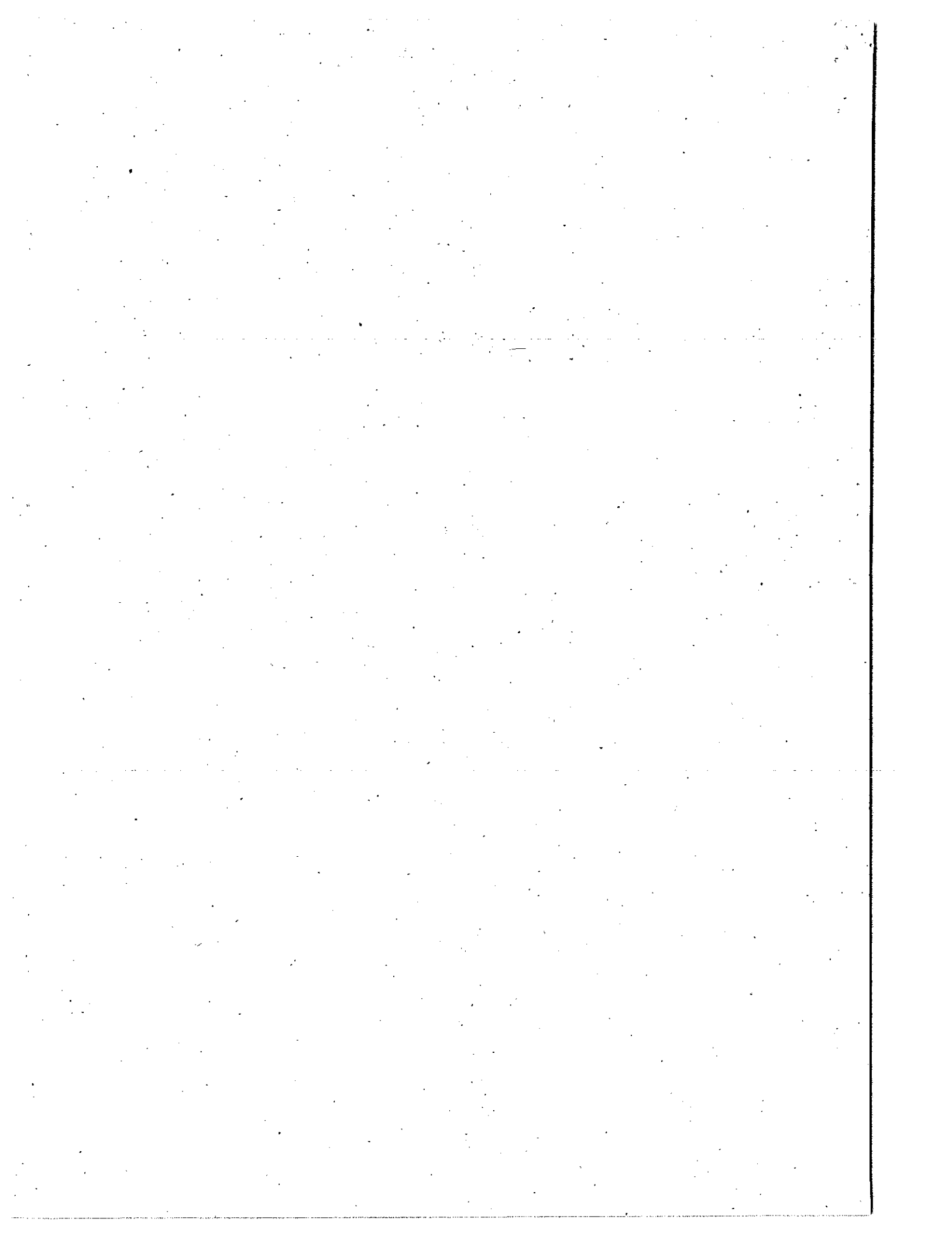
1. A parabolic arch, hinged at the ends has a span 30 m and rise 5m. A concentrated load of 12 kN acts at 10 m from the left hinge. The second moment of area varies as the secant of the slope of the rib axis. Calculate the horizontal thrust and reactions at the hinges. Also, calculate the maximum bending moment any where on the arch.
2. Four wheel loads of 6, 4, 8 and 5 kN cross a girder of 20 m span, from left to right followed by U.D.L of 4 kN/m and 4m long with the 6 kN load leading. The spacing between the loads in the same order are 3m, 2m and 2m. The head of the U.D.L. is at 2m from the last 5 kN load. Using influence lines, calculate the S.F. and B.M. at a section 8 m from the left support when the 4kN load is at centre of the span.
3. Analyse the building frame, subjected to horizontal forces as shown in fig use portal method.



4. Using castigliano's first theorem, determine the deflection and rotation of the overhanging end A of the beam loaded as shown in fig.



5. Explain Muller - Breslau principle and its application for drawing ILD.



6E1543**6E1543**

B.Tech. VI Sem.. (Main/Back) Examination, June - 2022
Civil Engg.
6CE4-03 Environmental Engineering

Time : 3 Hours**Maximum Marks : 120****Min. Passing Marks : 42****Instructions to Candidates:**

Attempt all ten questions from Part A, five questions out of Seven from Part B and Four questions out of Five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

Part - A**(Answer should be given up to 25 words only)****All questions are compulsory****(10×2=20)**

1. Describe about the term 'water softening'.
2. What are the prime functions of service Reservoir.
3. Define Design period.
4. What are the different pipe materials, which are commonly used for water conveyance.
5. Give the maximum acceptable limit of the following for the public drinking water.
 - a. Color.
 - b. pH.
 - c. Chlorides.
 - d. Sulphates.
6. What factor control water supply to building.
7. Give the flow diagram of a conventional municipal waste water treatment.
8. List out any four indoor air pollutants.
9. Describe noise pollution standards.
10. Define sullage and sewage.

Part - B

(Analytical/Problem solving questions)

Attempt any five questions

(5×8=40)

1. Discuss the merit and demerits of separate and combined system of sewage. (8)
2. Explain the sedimentation process used in water treatment plant. (8)
3. Determine the size of a circular sewer for a discharge of 800 litres per second running half full. Assume $S = 0.0001$ and $n = 0.015$. (8)
4. Define BOD. What is the significance of 5 day BOD determination? What is the role of temperature in BOD satisfaction. (8)
5. Describe noise pollution and the ways of reducing noise pollution. (8)
6. Describe the primary and secondary air pollutants and their ill effects. (8)
7. Describe the various water distribution systems and compare them. (8)

Part - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Four questions

(4×15=60)

1. a. What is the effect of SO_x, NO_x and SPM on human beings? What are their permissible limits in air. (8)
b. Describe methods of controlling air pollution. (7)
2. a. What is sewage farming? What are its advantages over the methods of disposal of sewage by dilution. (8)
b. Explain briefly the principles of working of aerobic, anaerobic and Facultative type of stabilization ponds. (7)
3. a. Write down the physical, chemical and biological water quality standards for drinking water. (8)
b. Discuss the common impurities found in water along with their adverse effect. (7)
4. a. With the help of a flow diagram, describe the unit process in a municipal water treatment system. Also describe what kind of impurities will be removed after the end of each process. (8)
b. Explain the working of a rapid sand filter with neat sketch. What are the desirable qualities of filter media. (7)
5. a. The population of a city as per the census record available is as follows.

Census year	1951	1961	1971	1981	1991	2001	2011
Population	24835	29578	36147	49960	57620	67832	74638

Estimate the population of the city after four decades by Arithmetical increase, Geometrical increase and Incremental increase method. (8)
b. The BOD of a sewage sample when incubated for 7 days at 30°C was 450 mg/litre. Calculate the 5 days BOD at 20°C. (7)

6E1544

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[Total No. of Pages : 3]

6E1544**B.Tech. VI Sem. (Main/Back) Examination, June - 2022****Civil Engg.****6CE4-04 Design of Steel Structures****Time : 3 Hours****Maximum Marks : 120****Min. Passing Marks : 42*****Instructions to Candidates:***

Attempt all ten questions from Part A, five questions out of Seven from Part B and Four questions out of Five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory

(10×2=20)

1. Write any two advantages of steel as a structural material:
2. What is the plastic hinge?
3. Name any two theorems of plastic analysis.
4. What are prying forces?
5. Name any four types of tension members.
6. Explain the web buckling in beam.
7. Explain how column caps are similar to column base plates.
8. Why the portal bracings are provided in truss girder bridge?
9. Name any four component of gantry and crane truss arrangement.
10. Explain the stiff bearing length in plate girder.

PART - B

(Analytical/Problem solving questions)

Attempt any five questions

(5×8=40)

1. Find the shape factor of hollow tube section of external diameter D and internal diameter d .
2. The plates of a 6 mm thick tank are connected by a single bolted lap joint with 20 mm diameter bolts at 60 mm pitch. Calculate the efficiency of the joint. Take f_u of plate as 410 MPa and assume 4.6 grade bolts.
3. Design a stanchion 3.5 m long, in a building, subjected to a factored load of 550 kN. Both the ends of the stanchion are effectively restrained in direction and position. Use steel of grade Fe410.
4. Explain the typical arrangement of gantry girder and crane girder with diagram.
5. What do you understand by outstand of web stiffeners? How does a plate girder derive post - buckling strength?
6. What is Shear lag? Explain the types of failures in tension member.
7. A simply supported steel joist of 4.0 m effective span is laterally supported throughout. It carries a total uniformly distributed load of 40 kN (inclusive of self weight). Design an appropriate section using steel of grade Fe410.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Four questions

(4×15=60)

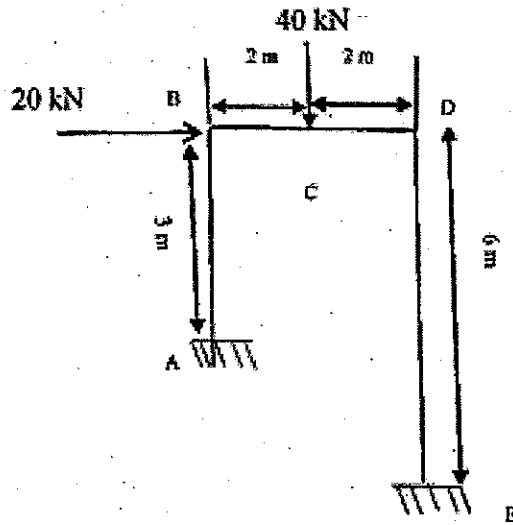
1. A column ISHB 350 @ 661.2 N/m carries an axial compressive factored load of 1700 kN. Design a suitable bolted gusset base. The base rests on M 15 grade concrete pedestal. Use 24 mm diameter bolts of grade 4.6 for making the connections.
2. A diagonal member of a roof carries an axial tension of 450 kN. Design the section and its connection with a gusset plate and lug angle. Use $f_y = 250$ MPa and $f_u = 410$ MPa.
3. A gantry girder with manually operated travelling crane, to be used in an industrial building, for the following data ;
Self - weight of the crane girder excluding trolley : 200 kN
Self - weight of the trolley, hook, electric motor, etc. : 40 kN
Crane capacity : 200 kN
Approximate minimum approach of the crane hook to the Gantry Girder : 1.20 m
Diameter of crane wheels : 150 mm, Wheel base : 3.5m

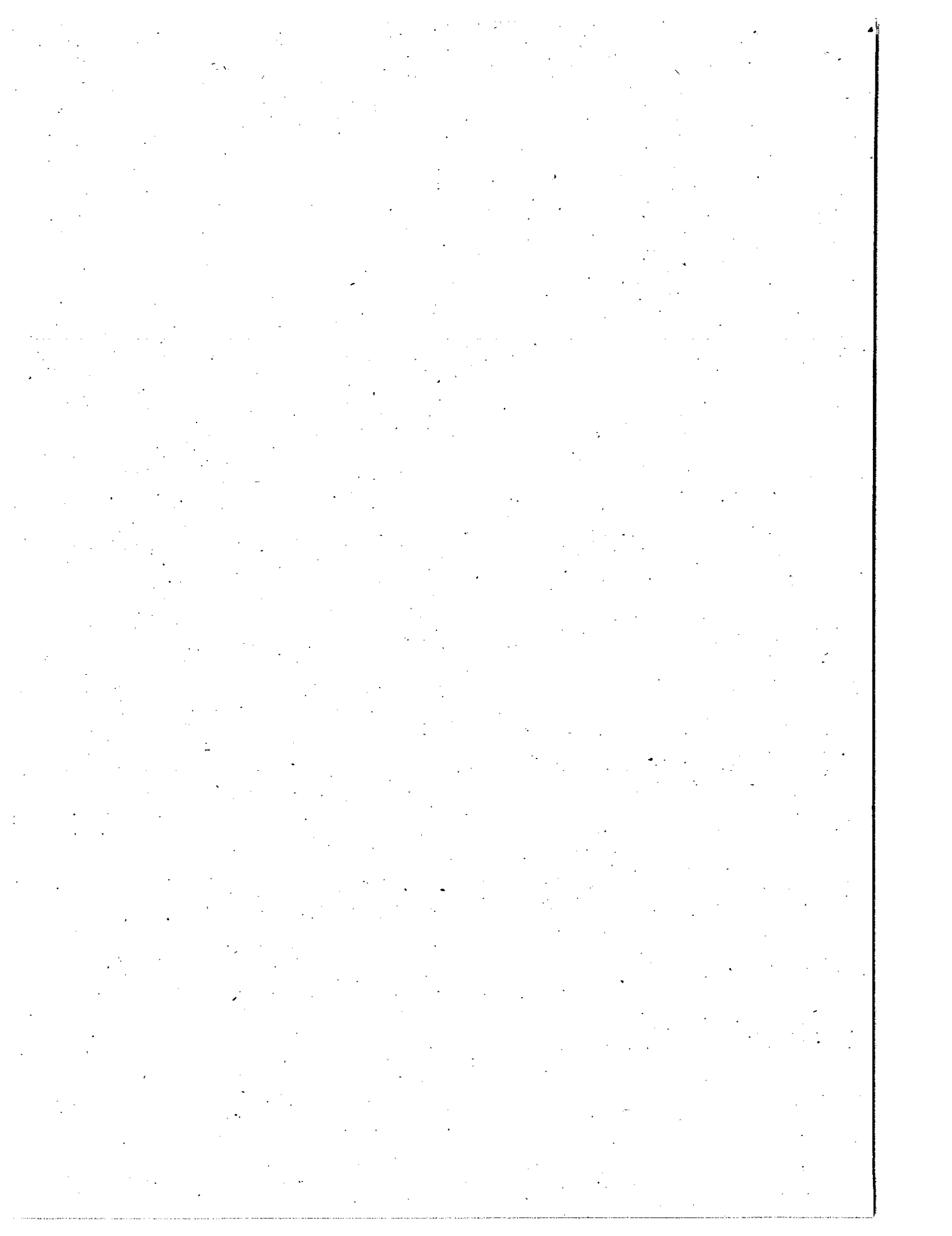
c/c distance b/w gantry rails : 16 m, c/c distance b/w columns (span of gantry girder)
: 8 m

Self - weight of rail section : 300 N/m

Grade of steel Fe415. Find the suitable trial sections for gantry girder.

4. Design a welded plate girder 25 m in span and laterally restrained throughout. It has to support a uniform load of 100 kN/m throughout the span exclusive of self - weight. Design the web of girder without intermediate transverse stiffeners. The steel for the flange and web plates is of grade Fe410.
5. Find out the fully plastic moment in the portal frame shown in fig. The frame has a uniform cross section throughout.





6E1545

Roll No. _____

[Total No. of Pages : 3]

6E1545**B.Tech. VI Sem. (Main/Back) Examination, June - 2022****Civil Engg.****6CE4 - 05 Estimating & Costing****Time : 2 Hours****Maximum Marks : 80****Min. Passing Marks : 28****Instructions to Candidates:**

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination (As mentioned in form No. 205)

PART - A**(Answer should be given up to 25 words only)****All questions are compulsory.****(5×2=10)**

1. Discuss the scope of the course for you?
2. What is estimate? Discuss the principles of estimating?
3. Describe the bill of quantities?
4. What is rate analysis?
5. What do you mean by valuation?

PART - B

(Analytical/Problem solving questions)

Attempt any four questions.

(4×10=40)

1. Explain the methods of estimate in detail?
2. What is the importance of rate analysis? Analyze the rate of following item of work for cement concrete 1:2:4 on floor (assume suitable rate of material and labour)?
3. Prepare detailed rate analysis for providing and laying Brick masonry work for 230 mm thick wall using 1:4 (cement : sand) mortar in foundation and plinth.
4. Define the following :
 - a. Measurements sheet and abstract sheet.
 - b. Plinth area rate.
 - c. Cubical content rate.
 - d. Revised and supplementary estimates.
 - e. Scrap value.
5. Explain the principle of valuation? Discuss the different method of valuation?
6. Write the detail specification for the following items :
 - a. Damp Proof Course.
 - b. Brickwork.

PART - C


(Descriptive/Analytical/Problem Solving/Design Question)

Attempt any two questions.

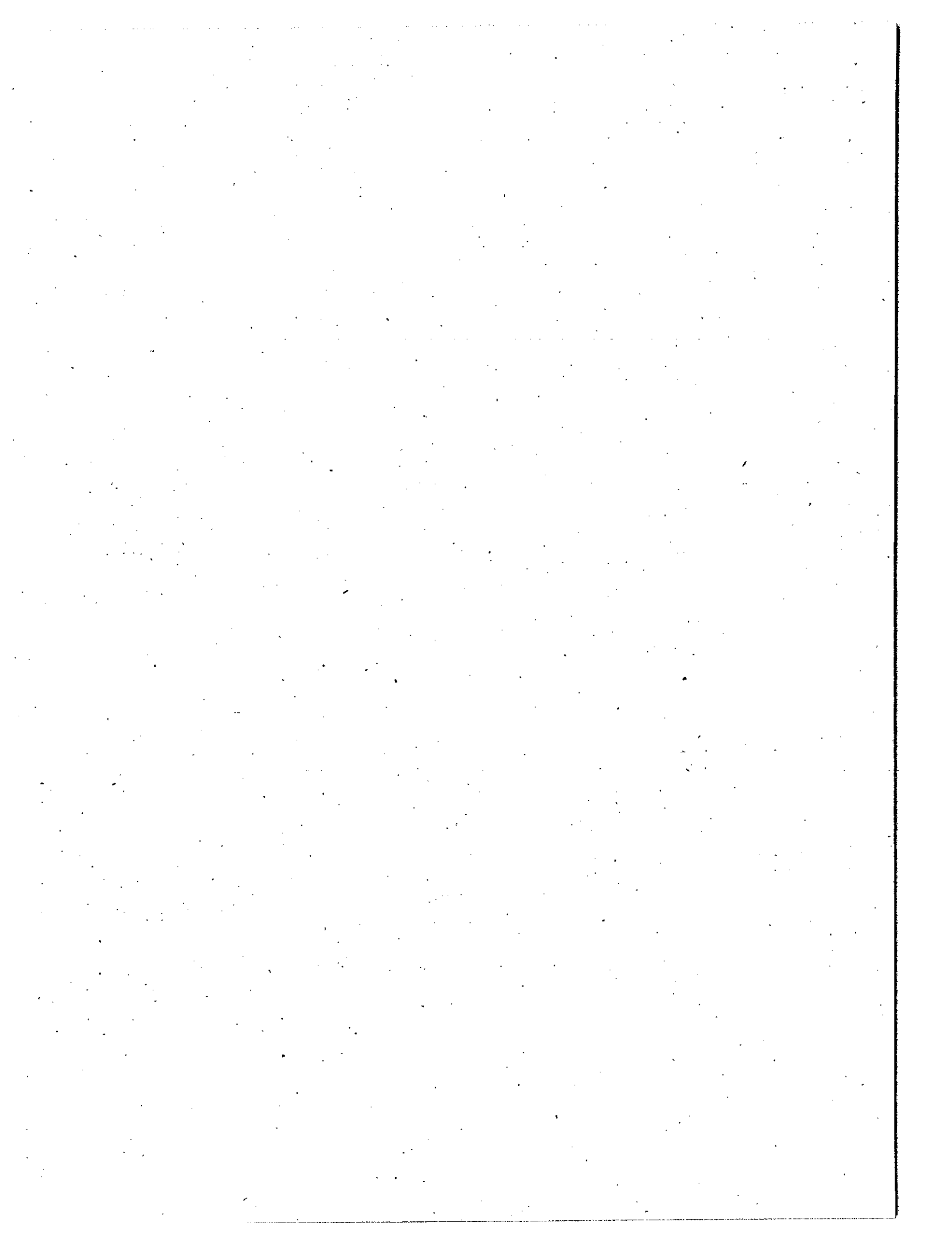
(2×15=30)

1.
 - a. What is depreciation? Explain the methods of calculating depreciation?
 - b. The owner of a property gets a net annual income of Rs. 40,550/- that he invests at 6% interests. At the end of 13 years he carries out certain repairs at the cost of Rs. 1,22,000/-. He then gets an offer from a buyer to purchase the property for Rs. 6,00,000/-. Determine who is at advantage owner or buyer?
2. Write short notes on :
 - a. Sinking fund.
 - b. Year's purchase.
 - c. Rent fixation of buildings.

3. Estimate the cost of earth work for a portion of road at the rate of Rs. 465/- in banking and Rs. 365/- in cutting for 400 m length from the following data. Formation width of road is 10 m; side slopes are 2:1 in banking and 1:5:1 in cutting.

Station	Distance in meters	R.L of ground	R.L of formation
25	1000	51.00	52.00
26	1040	50.90	Downward gradient of in 200 
27	1080	50.50	
28	1120	50.80	
29	1160	50.60	
30	1200	50.70	
31	1240	51.20	
32	1280	51.40	
33	1320	51.30	
34	1360	51.00	
35	1400	50.60	

Draw the longitudinal section of road and a cross section.



6E1547**6E1547****B.Tech. VI Sem. (Main/Back) Examination, June - 2022****Civil Engg.****6CE5- 12 Solid and Hazardous Waste Management****Time : 2 Hours****Maximum Marks : 80****Min. Passing Marks : 28****Instructions to Candidates:**

Attempt All Five questions from Part A, Four questions out of Six questions from Part B and Two questions out of Three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(5×2=10)

1. Define Solid Waste.
2. Define 3R principal.
3. Explain Sanitary landfilling.
4. What is Bioremediation?
5. Define Industrial Waste.

PART - B

(Analytical/Problem solving questions)

Attempt any Four questions.

(4×10=40)

1. Describe the environmental concerns of solid waste disposal sites.
2. Describe various collection systems. What are the advantages and disadvantages of door - to - door collection system?
3. Sketch and describe the equipment for collection and transport of solid waste?
4. Discuss the treatment and disposal of industrial solid waste.
5. How do we decide the labour requirements for collection of solid waste?
6. What are the various points to be kept in mind while choosing the collection route of vehicle to pick up solid waste?

PART - C

(Descriptive/Analytical/Problem Solving Design Questions)

Attempt any **Two** questions.

(2×15=30)

1. Suggest various methods for reducing the solid waste generation in the industries.
 2. What are the different types and materials used for storage containers? Explain with suitable sketches.
 3. What do you understand by sanitary land filling? How is it different from a normal land filling? How is it practiced? Explain the filling process with a neat sketch.
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6E1520**6E1520****B.Tech. VI Sem. (Main/Back) Examination, June - 2022****Civil Engineering****6CE5-16 3. Geographic Information System & Remote Sensing****Time : 2 Hours****Maximum Marks : 80****Min. Passing Marks : 28****Instructions to Candidates:**

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form.No.205)

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory**(5×2=10)**

1. Define Remote Sensing. (2)
2. What is difference between arial and terrestrial photographs. (2)
3. Define atmospheric window. (2)
4. What is meta data. (2)
5. Write down any four use of GIS. (2)

PART - B

(Analytical/Problem solving questions)

Attempt any four questions**(4×10=40)**

1. Define photogrammetry. Describe classification of photographs. (10)
2. Write a short note on :
 - i. Scattering.
 - ii. Spectral signature. (5+5)

3. a. Write a short note on characteristics of sensors.
b. Explain orbital parameters of a satellite. (5+5)
4. Give the salient features of cadastral, thematic and topographic maps. (10)
5. a. What is meant by Ground Truth in remote sensing.
b. What are advantages of multiband and multiband images in Remote Sensing. (5+5)
6. Write application of GIS in water resources. (10)

PART - C

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any two questions (2×15=30)

1. a. Define remote sensing and various stages of remote sensing system. (10)
b. Write a short notes on Electromagnetic Radiation. (5)
 2. Describe various techniques used in Digital Image processing. (15)
 3. a. Explain vector and raster data structure. (7)
b. Discuss about application of GIS in urban planning. (8)
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6E1548**6E1548****B.Tech. VI Sem. (Main/Back) Examination, June - 2022****Civil Engg.****6CE5 - 13 Traffic Engineering and Management****Time : 2 Hours****Maximum Marks : 80****Min. Passing Marks : 28****Instructions to Candidates:**

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination (As mentioned in form No. 205)

PART - A

All questions are compulsory (5×2=10)

1. What do you understand by the term traffic planning. (2)
2. Why we are doing traffic surveys. Explain in brief. (2)
3. Describe the significant roles of traffic control personnel for various purposes. (2)
4. Write a short note on environmental hazards. (2)
5. Explain the IRC standards for traffic system management. (2)

PART - B

Attempt any four questions (4×10=40)

1. Describe the various fundamentals of traffic flow. (10)
2. How would you analyse accident by using various methods. Explain in brief. (10)
3. What are the various types of traffic signs and markings used in roadways. (10)
4. Explain the objective, scope and outcome of traffic engineering and management. (10)
5. Write a short note on traffic regulatory measures in detail. (10)
6. What are the various types of street lighting used in highways. (10)

PART - C

Attempt any two questions

(2×15=30)

1. Describe PIEV theory of traffic in detail. Also write a short note on origin and destination survey. (15)
 2. What is meant by intersection. Explain its design procedure in detail with suitable diagrams. (15)
 3. Explain the various causes, effects and prevention of road accidents in detail.(15)
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6E6033**6E6033**

B.Tech. VI-Sem. (Back) Examination, June - 2022
Civil Engineering
6CE3A Environmental Engineering - II

Time : 3 Hours**Maximum Marks : 80****Min. Passing Marks : 24****Instructions to Candidates**

Attempt any five questions, selecting one question from each unit. All questions carry equal marks.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

UNIT - I

1. a) Explain the role of an Environmental Engineer. (8)
b) Explain the following terms:
i) Sewage
ii) Sewerage
iii) Sullage
iv) Garbage (4×2=8)

(OR)

1. Explain the following terms.
i) BoD
ii) CoD
iii) Do
iv) JoC (4×4=16)

UNIT - II

2. a) Explain Hydraulic design of sewers. (8)
b) Discuss sewage pumping and pumping stations. (8)

(OR)

2. a) Explain various joints in sewers with neat sketch . (8)
b) Explain separate and Combined system of sewage. (8)

UNIT - III

3. a) Explain septic tank and its components with neat sketch. (8)
b) Describe with neat sketch working of trickling filter. (8)

(OR)

3. a) Explain with neat sketch various units in sewage treatment plants. (8)
b) Write short notes on sludge digestion and drying beds. (8)

UNIT - IV

4. a) Write a short notes on self purification of streams. (8)
b) What are the methods, problems and limitations of sewage disposal on land. (8)

(OR)

4. a) Explain various systems of plumbing. (8)
b) Describe disposal of sewage by dilution. (8)

UNIT - V

5. a) Write short notes on green house effect. (8)
b) Describe Acid rain. (8)

(OR)

5. a) Explain effect of noise pollution on Human health. (8)
b) Explain different sources of air pollution. (8)

Total No. of Questions:

Total No. of Pages:

Roll No. _____

6E6034

B.Tech. VI-Sem (Back) Exam 2022
Civil Engineering
6CE4A Design of Concrete Structures-I
6E6034

Time: 3Hours

Maximum Marks: 80
 Min Passing Marks: 24

Attempt any five questions, selecting one question from each unit.
 All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

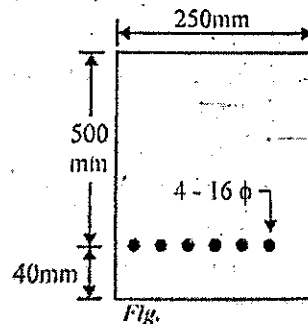
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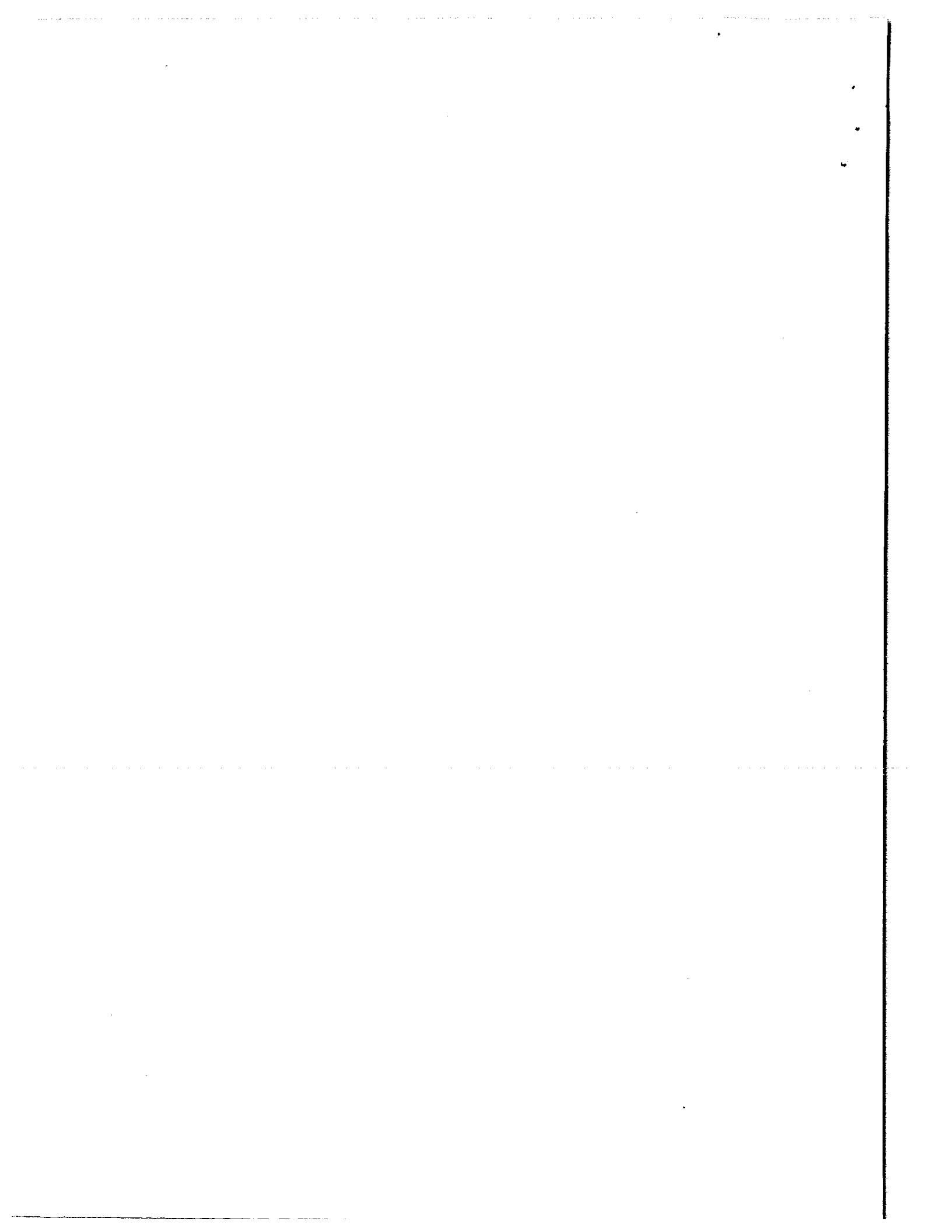
UNIT-I

- Q1 (a) Using limit state design method, determine and provide the tension reinforcement for resisting a working moment of 125kN-m. The beam section is having width =300mm and effective depth =675mm. Use M-20 and Fe-415. Give the neat sketch showing all details. [8]
- (b) Compare the silent features of limit state design philosophy and working stress design philosophy. [8]

OR

- Q1 (a) What do you understand by a Balanced section, over reinforced and under reinforced section.
- (b) A beam section shown in fig. Is of M-20 and Fe-415. If this section is used for a simply supported beam of 4m effective span then, determine the permissible superimposed working load(U.D.L) that the beam can carry safely.





UNIT-II

- Q2 (a) What do you understand by a singly reinforced beam and doubly reinforced beam . State the condition where a doubly reinforced beam is preferred. [8]
 (b) Draw the stress block parameters for a typical T-beam section having $x_u = 7/3 D_f$. Also give the formula to determine its ultimate moment of resistance. [8]

OR

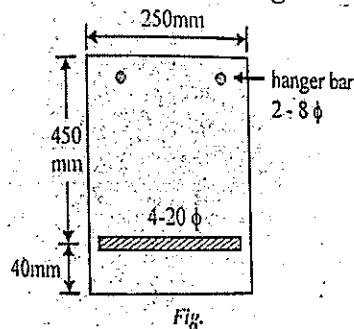
- Q2 (a) Draw the strain and stress block parameters for a under reinforced doubly reinforced E rectangular beam section and write the formula to calculate the moment of resistance of the same. Also describe each and every term used in the formula. [8]

(b) A beam, simply supported over an effective span of 7m carries a live load of 20kN/m. Design the beam, using M-20 concrete and HYSD bars of grade Fe-415. Keep the width equal to half the effective depth. Assume unit weight of concrete as 25kN/m³ [8]

UNIT-III

- Q3 (a) With the help of neat sketches, show
 1. Two legged vertical stirrups
 2. Three legged vertical stirrups
 3. Inclined shear stirrups [6]

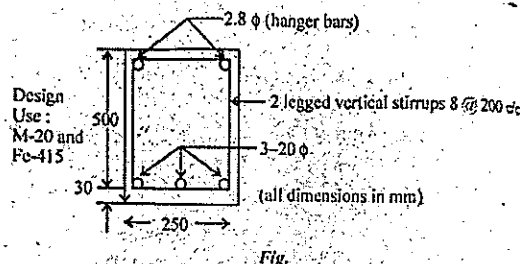
(b) For the beam shown in fig. Design the minimum shear reinforcement. Draw the neat cross section and longitudinal section showing all reinforcement.



[10]

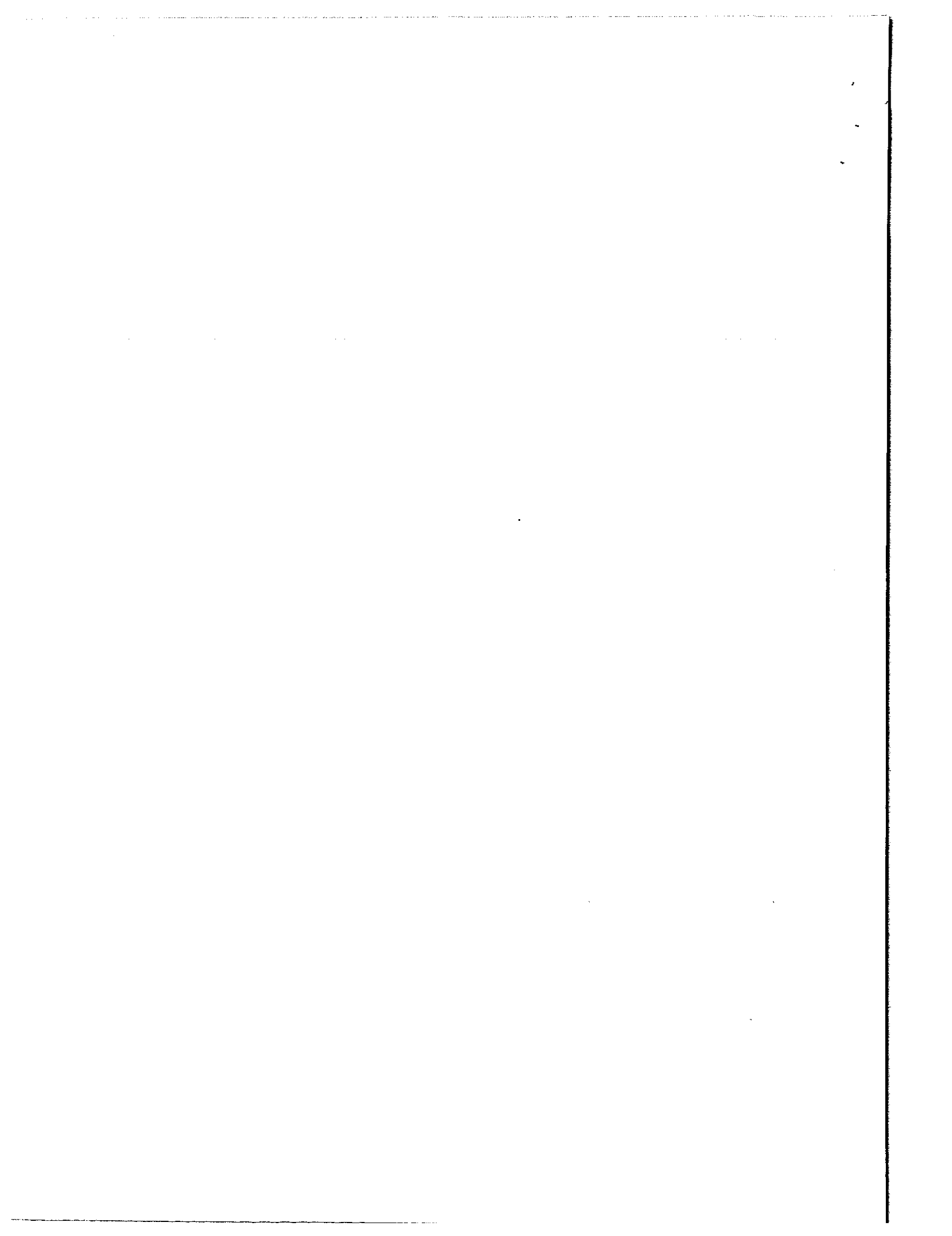
OR

- Q3 (a) Determine the Ultimate shear strength of the support section shown in fig. By using limit state method.



[8]

(b) Design the shear reinforcement for a beam width $b=350\text{mm}$, $d=550\text{mm}$, $V_u=125\text{kN}$, $F_{ck}=25\text{N/mm}^2$, $F_y=415\text{N/mm}^2$ and percentage of steel is 1.67%.



UNIT-IV

Q4 (a) Explain the difference between one way slab and two-way slab. [8]

(b) The interior panel of a flat slab is of $6\text{m} \times 6\text{m}$. The thickness of slab = 150mm , thickness of drop = 200mm column head diameter = 1.5m , drop width = 3m . The slab is subjected to total ultimate bending moment (M_o) = 230kN-m . Distribute the moments in column and middle strips and show them in neat plan. [8]

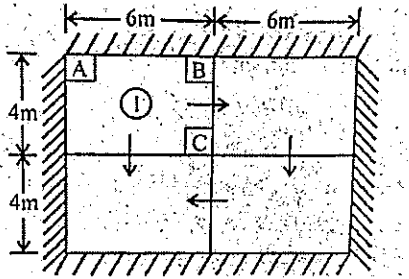
OR

Q4 (a) With the help of neat sketch describe the following for a flat slab

1. Column strip
2. Middle strip
3. Panel
4. Drops

[2x4=8]

(b) In the fig. Discuss the provisions for torsion reinforcement in panel(1) at corner A, B and C. Draw the neat sketch showing detailing of torsion reinforcement of these corners if the main reinforcement is as below: (i) along shorter span -ve reinf = 360mm^2 +ve reinf = 240mm^2
 (ii) along longer span +ve reinf = 200mm^2 +ve reinf = 220mm^2



[8]

UNIT-V

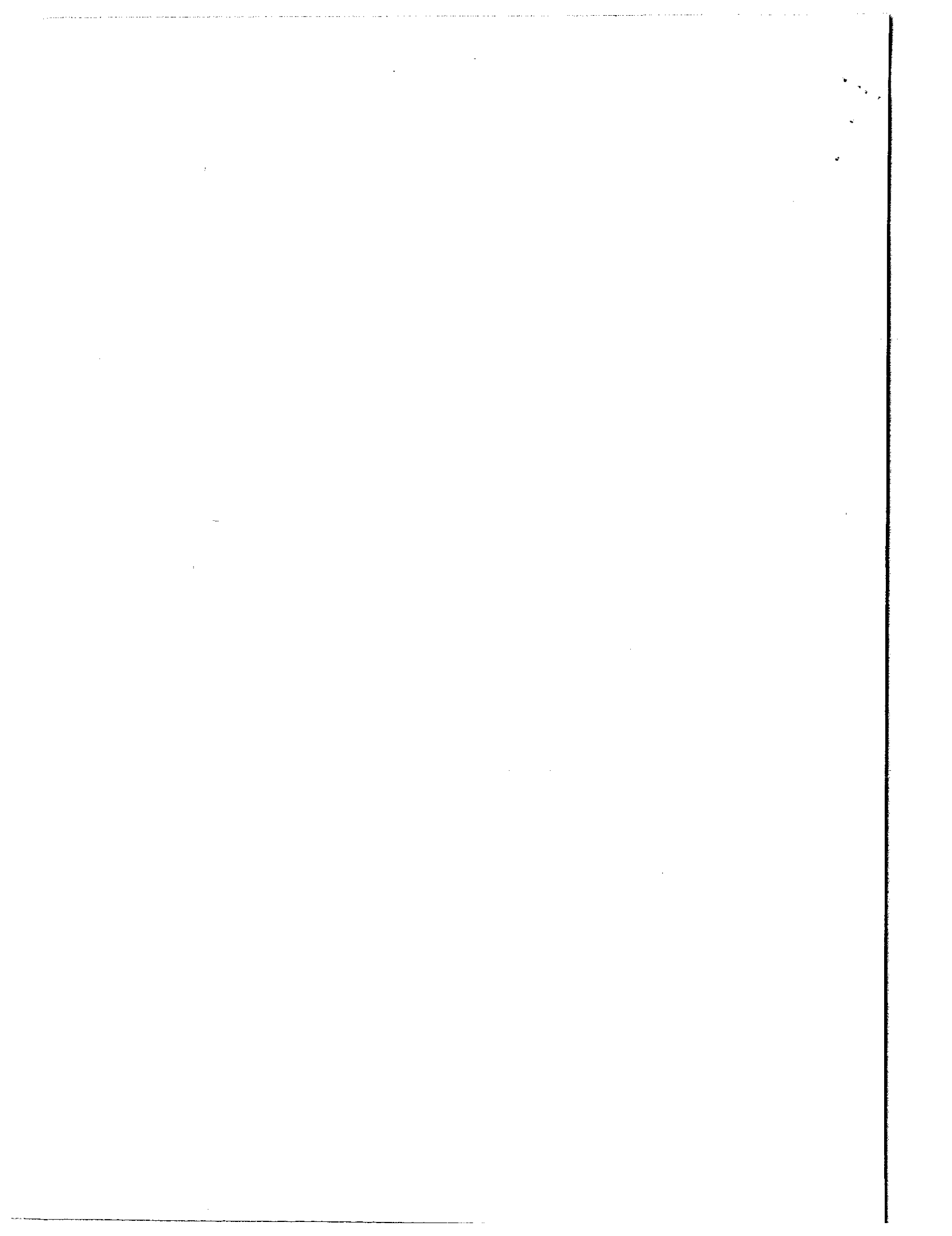
(a) Describe one way shear and two way shear in a square footing. [8]

(b) A reinforced concrete short column of 480mm diameter is reinforced with 6-20 ϕ (Fe-415) and 8mm ϕ helix with 75mm pitch. Compute the maximum load carrying capacity of the column if concrete is of M-25 grade. [8]

OR

(a) Describe the Balanced failure, compression failure and tension failure of a short column subjected to axial load and un axial moment. [8]

(b) Design the reinforcements in rectangular column of size 300mm by 500mm to support a design ultimate load of 500kN. Together with a factored moment of 200kN.m. Adopt the value, $F_{ck} = 25\text{N/mm}^2$, $F_y = 415\text{N/mm}^2$. [8]



Total No. of Questions:

Total No. of Pages:

Roll No. _____

B.Tech. VI-Sem (Back) Exam 2022
Civil Engineering
6CE2A Geotechnical Engineering-II
6E6032

Time: 3Hours

Maximum Marks: 80
Min Passing Marks: 24

Attempt any five questions, selecting one question from each unit.
All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

1. Nil

2. Nil

Q1 (a) Derive an expression for the vertical stress at a point due to point load using Boussinesq's theory? (8)

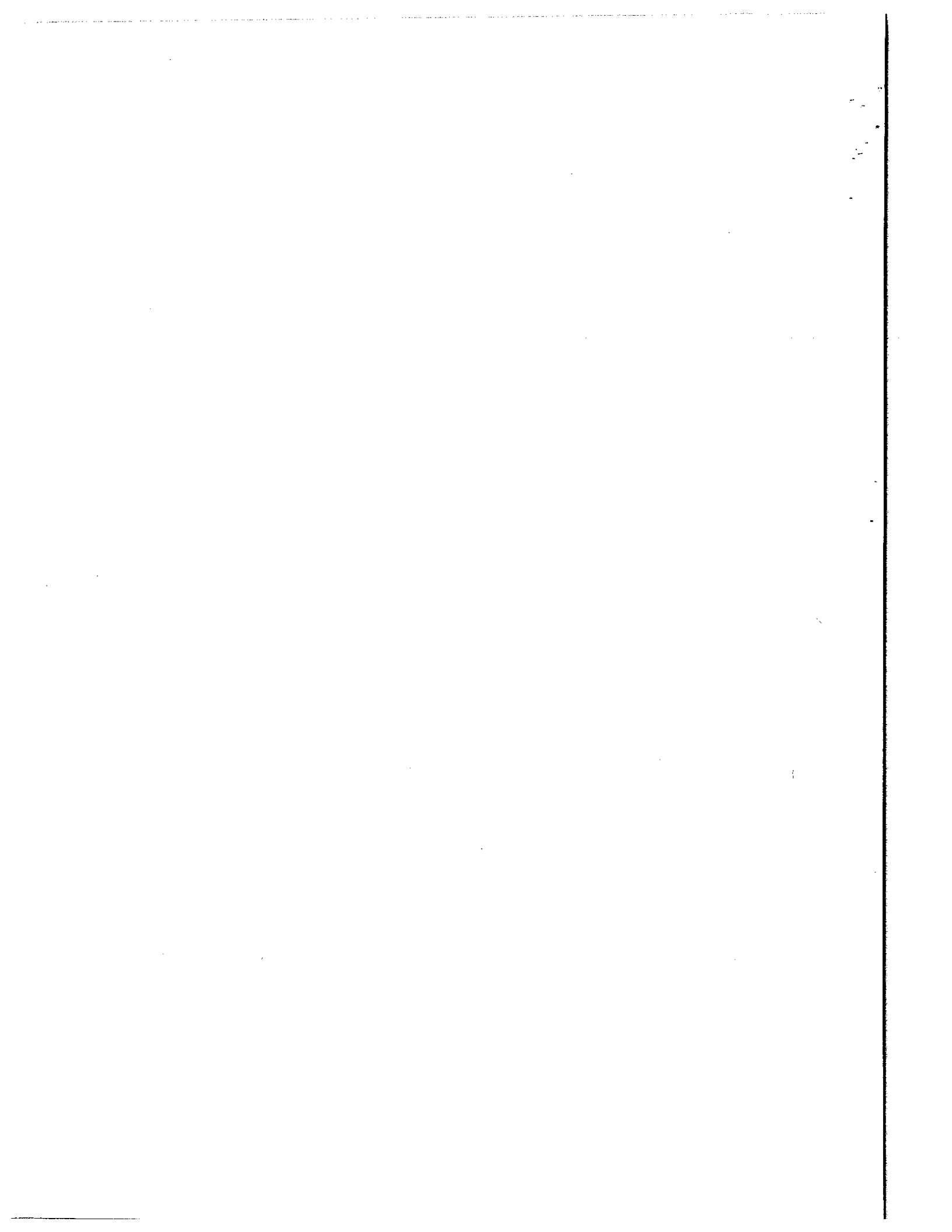
(b) A concentrated load of 50 kn acts on the surface of a homogeneous soil mass of large extent. Determine the stress intensity at a depth of 5m, directly under the load and at a horizontal distance of 2.5m. (8)

OR

Q1 (a) Describe the method of calculating the stress at a point below the corner of a rectangular load. How is this method used for finding the stresses at points other than that below the corner? (8)

Q1 (b) A 1000 kN load is uniformly distributed on a surface area of 3m×2.5m. Find the approximate value of vertical stress at a depth of 2m using 2:1 distribution? (8)

Q2 (a) Discuss Terzaghi's theory of consolidation stating the various assumptions and their validity? (8)



- Q2 (b) Define the following:
Coefficient of Compressibility
Compression index
Coefficient of volume change
Recompression index

4x2=8

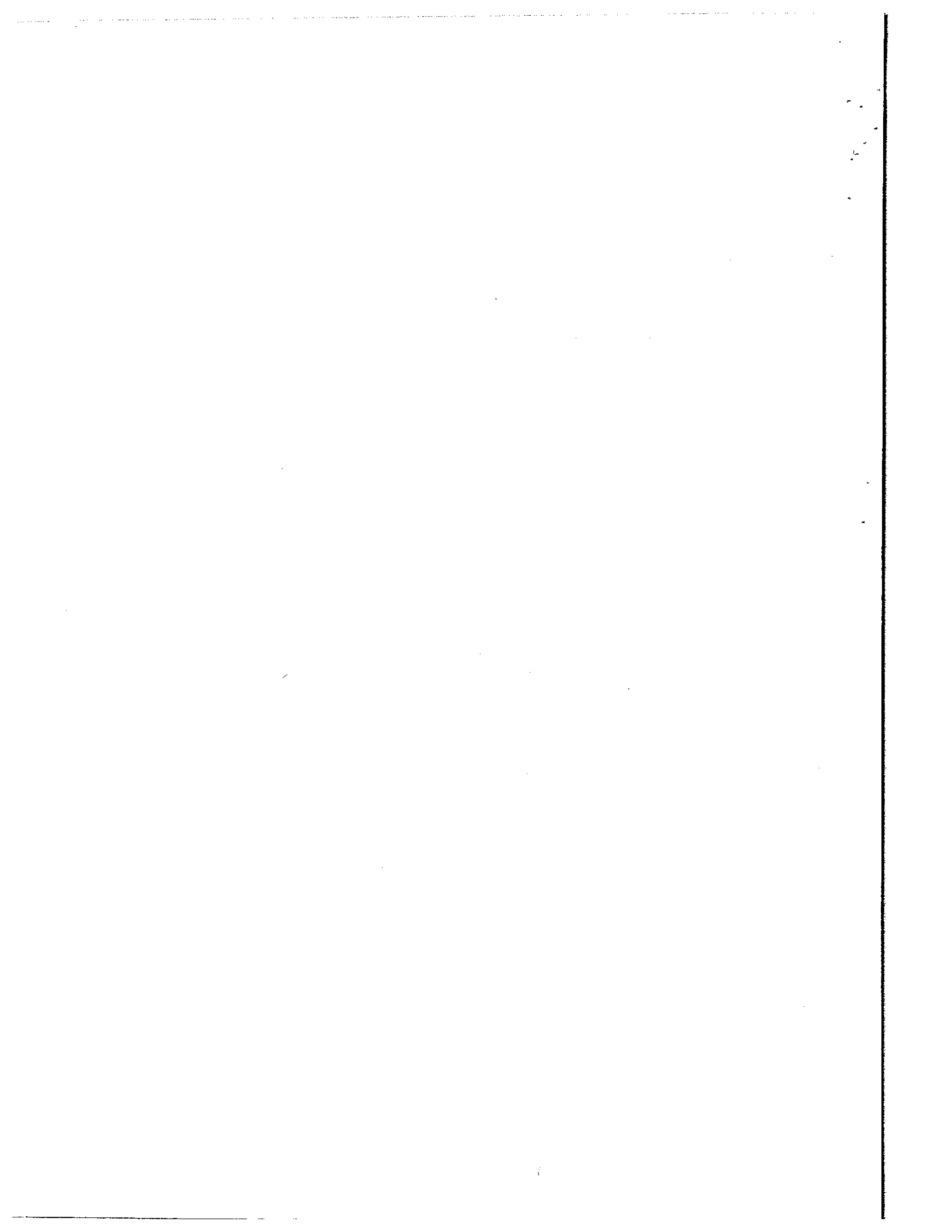
OR

- Q2 (a) Explain the time factor? How it is related to the average degree of consolidation? (8)
- (b) A clay layer 4m thick is subjected to a pressure of 55 kN/m^2 . If the layer has double drainage and undergoes 50% consolidation in one year. Determine the coefficient consolidation. Take $T_v=0.196$. (8)
- Q3 (a) Explain the different types of slope failures? Explain with neat sketches? (8)
- (b) How a slope is analyzed using Swedish circle method? (8)

OR

- Q3 (a) Describe the stability number? What is its utility in the analysis of stability of slopes? Discuss the uses of stability charts? (8)
- (b) Determine the factor of safety with respect to cohesion if an embankment 25 m high and having a slope of 40° is subjected to a sudden drawdown. $C= 40 \text{ kN/m}^2$, $\phi= 10^\circ$ and $\gamma_{\text{sat}}= 18 \text{ kN/m}^3$. (8)
- Q4 (a) Describe different types of earth pressure? (8)
- (b) What are the assumptions of Rankine's theory? Derive the expression for active pressure and passive pressure? (8)
- OR
- Q4 (a) Describe Rehmann's construction? (8)
- (b) Explain the trial wedge method? (8)
- Q5 (a) Discuss the effect of water table on the bearing capacity of soil? (8)

P.T.O.



(b) Define the following terms:

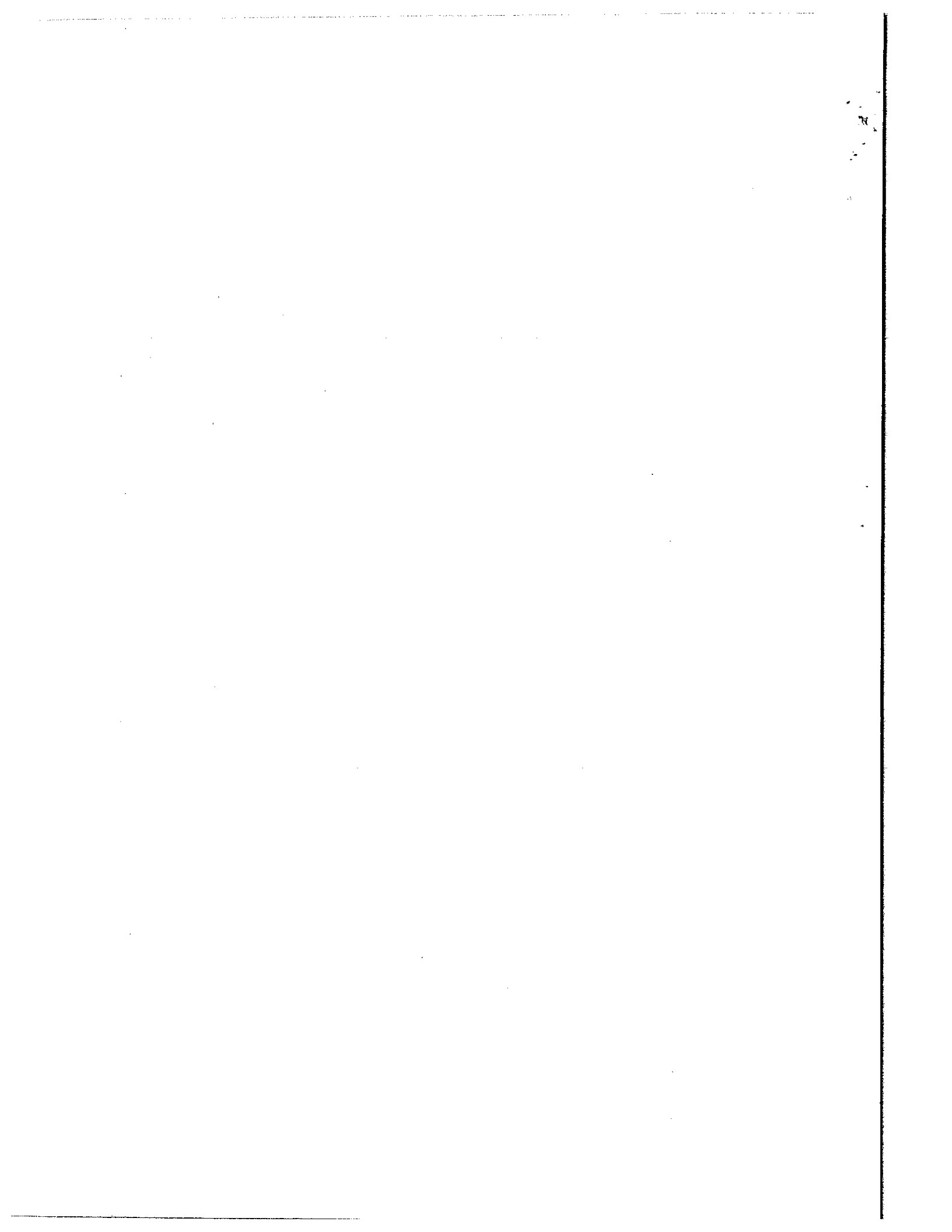
1. Ultimate bearing capacity
2. Net safe bearing capacity
3. Gross safe bearing capacity
4. Allowable soil pressure

(8)

OR

Q5 (a) Describe the assumptions made in the derivation of Terzaghi's bearing capacity theory? (8)

(b) Determine the ultimate bearing capacity of a strip footing 1.20 m wide and having the depth of foundation of 1.0 m. Using Terzaghi's theory and assume general shear failure. Take $\phi' = 35^\circ$, $\gamma = 18 \text{ kN/m}^3$ and $c' = 15 \text{ kN/m}^2$. (8)



Roll No. _____

[Total No. of Pages : 2]

6E6036

6E6036

B.Tech. VI-Sem. (Back) Examination, June - 2022
Civil Engineering
6CE6.1A Remote Sensing and GIS

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

Attempt any Five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

UNIT - I

1. a) Define Photogrammetry and Compare between aerial and terrestrial Photographs.
- b) What are the advantages and disadvantages of Photographic mapping? (8+8)

(OR)

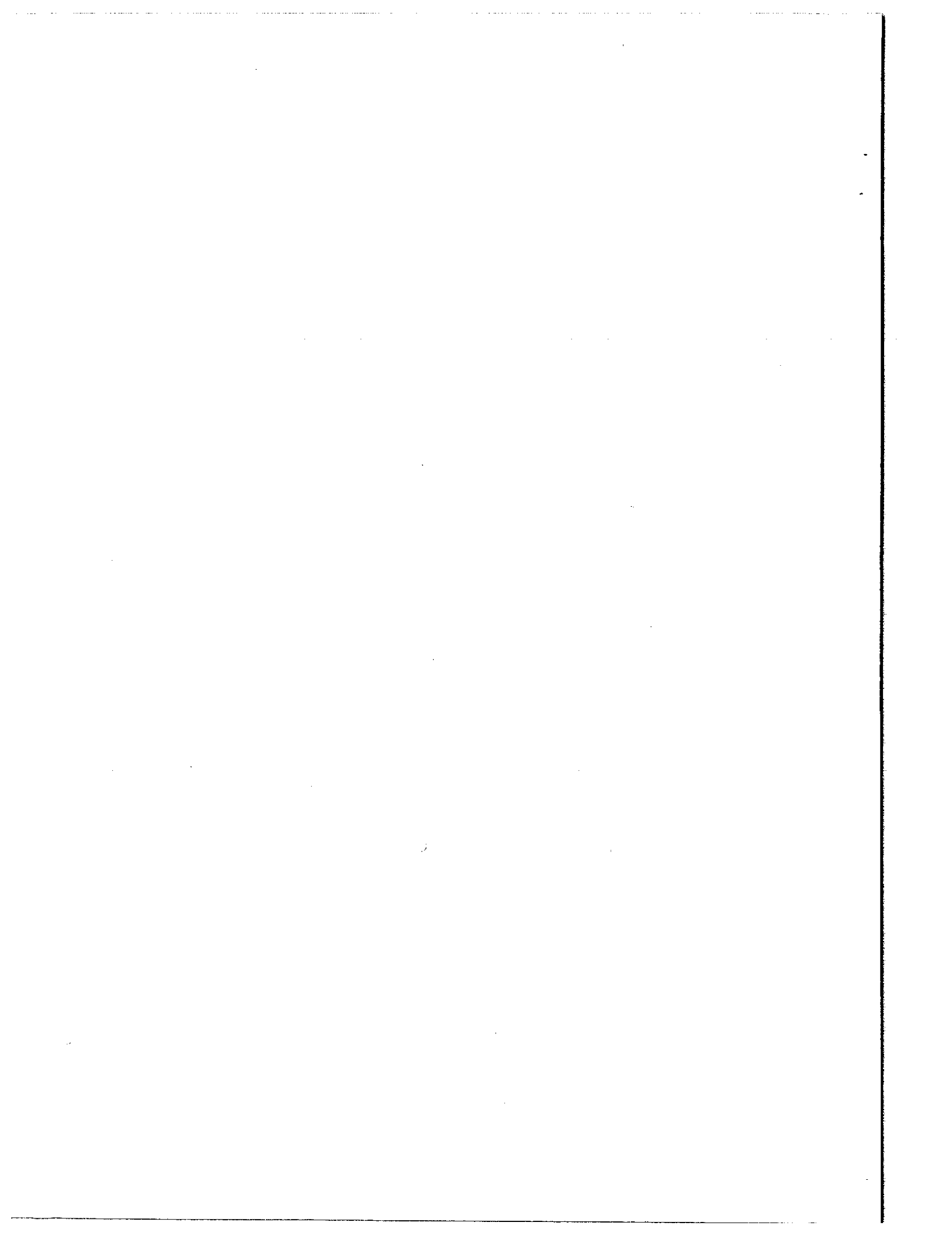
1. a) Describe various type of aerial Photographs.
- b) Describe tilt and height displacement. (8+8)

UNIT - II

2. Define remote sensing. Describe in brief with suitable diagrams the various stages of remote sensing system. (16)

(OR)

2. Write a short note on:
 - a) Electromagnetic Radiations.
 - b) Atmospheric window
 - c) Spectral signature.
 - d) Scanners. (4×4=16)



UNIT - III

3. What is Sensor? Write in brief about Sensors and their Characteristics. (16)

(OR)

3. a) Discuss about various types of Platforms.
b) Explain multi concept in remote sensing. (8+8=16)

UNIT - IV

4. Describe various elements of aerial Photographic and Satellite image interpretation. (16)

(OR)

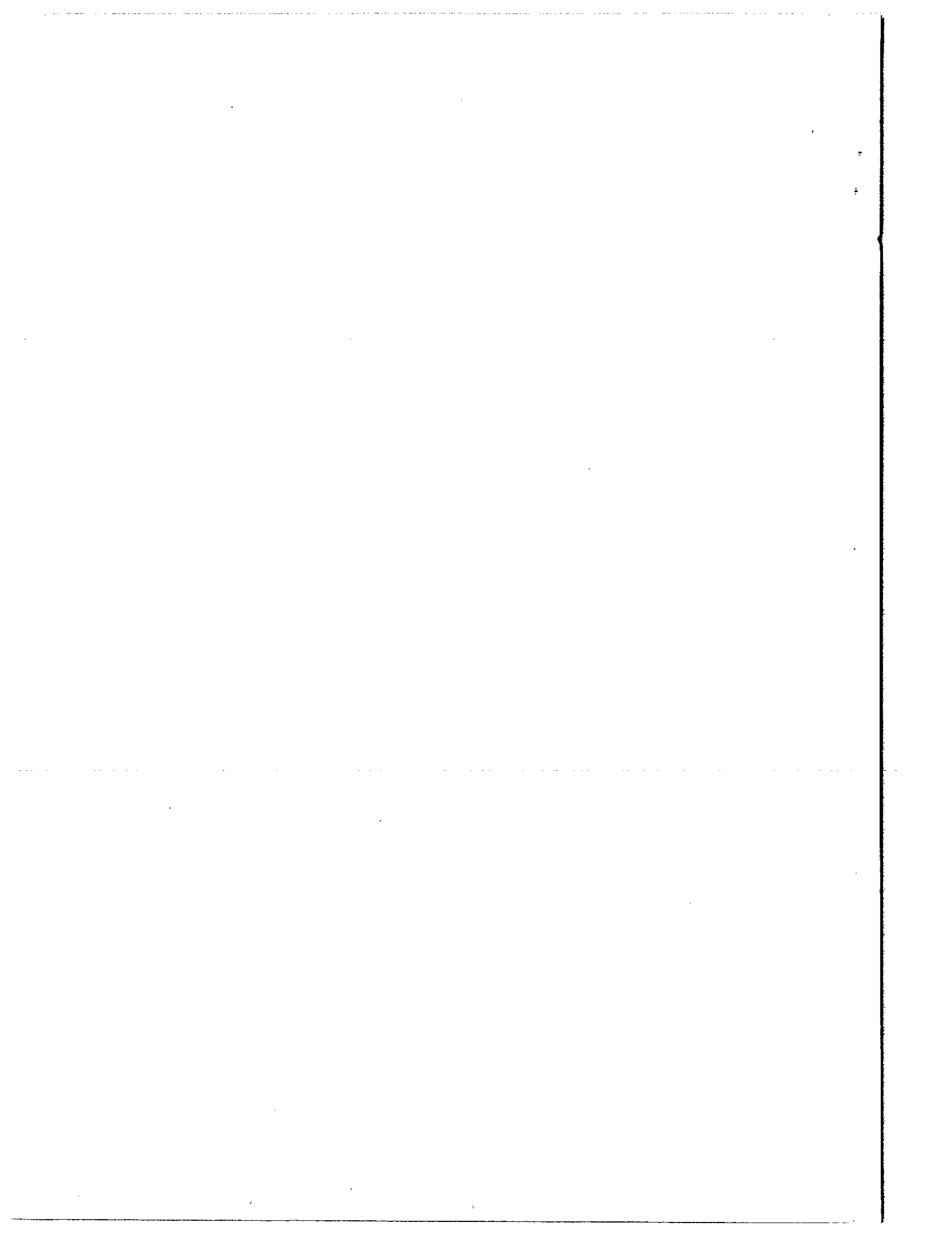
4. a) Explain digital image Processing.
b) Write a short note on multirate and multiband images. (8+8=16)

UNIT - V

5. Describe Geographical information system. Write an application of GIS on "Water resources". (16)

(OR)

5. a) Write a short note on application of GIS in geology.
b) Write a short note on application of GIS in forestry. (8+8=16)
-



6E6031

Total No. of Questions: 05

Total No. of Pages: 02

Roll No. _____

B.Tech. VI-Sem (Back) Exam 2022
Civil Engineering
6CE1A Theory of Structures-II
6E6031

Time: 3Hours

Maximum Marks: 80
Min Passing Marks: 24

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

1. NIL

2. NIL

UNIT -I

Q. 1 Draw the influence line diagram for reaction at A for the continuous beam A B C. $AB=BC=5m$. Flexural rigidity constant. Calculate ordinates at every / m interval. Beam is simply supported at A, B and C. (16)

OR

Q.1 a) What is influence line? Write the uses of influence line. (4)

b) Explain Muller Breslau Principle. (4)

c) A point of 50 kNm rolls over a girder of 20 m span. Draw ILD and find maximum positive and negative shear force and bending moment at a point 8 from left hand end. (8)

UNIT -II

Q. 2 A parabolic three hinged arch has a span of 20 m the centre of rise of the arch is 4m. It is loaded with UDL with intensity of 2 kN/m on left 8 m. Calculate:

a) Direction and Magnitude of the reaction at hinge,

b) Bending moment, Normal thrust and Radial shear at 4 m. (16)

OR

Q.2 Show that the horizontal thrust developed in a parabolic arch of span L and rise h subjected to concentrated load W at a distance a from springing is given by:-

$$H = [5 Wa (L-a) (L^2 + La - a^2)] / (8hL^3) \quad (16)$$

UNIT -III

Q. 3 The three hinged stiffness girder of a suspension bridge of 200m span is subjected to a point load of 25kN placed at 50m from left end hinge. Determine the bending moment and shear force at a section 80m from left end. Also calculate the maximum tension in the cable. Cable has a central dip of 20m. (16)

OR

Q.3 A light cable, 18m long is supported at two ends at the same level. The supports are 16m apart. The cable supports three loads of 8, 10 and 12 N dividing the 16 m distance in four equal parts. Find the shape of the string and the tension in various portions. (16)

UNIT -IV

Q. 4 Determine the principal moment of inertia for an unequal angle section 180mm x 120 mm x 9 mm. Use analytical expression on Mohr's Circle Method. (16)

OR

Q.4 a) Write short notes on (any two)

(i) Principal axes

(ii) Shear centre

(iii) Theories of failure (8)

b) Derive the expression to obtain the bending stress at any point when it is subjected to bending (M) inclined at an angle θ with one of the principal planes. (8)

UNIT -V

Q. 5 a) Explain force displacement relationship, also discuss flexibility matrix and flexibility coefficient. (8)

b) List the advantages of stiffness method, Explain stiffness matrix and stiffness coefficient. (8)

OR

Q.5 Write short notes on the following: (any four)

(i) Transformation Matrix

(ii) Degree of kinematic indeterminacy

(iii) Global matrix or global stiffness matrix

(iv) Rotation matrix

(v) Relation between flexibility and stiffness matrix. (4x4=16)