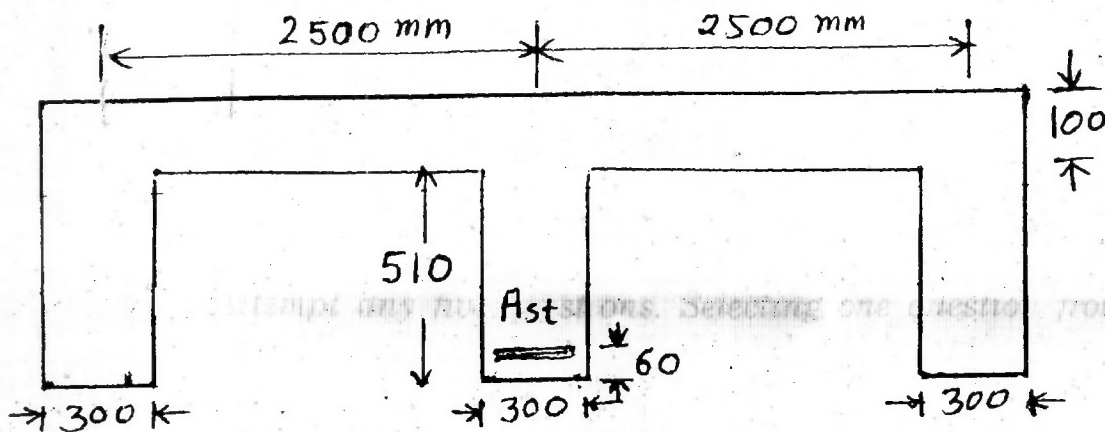


Also draw the neat stress-block parameters for this T-section.
Use M-20 and Fe-415.



A_{st} contains 3-22 Φ and 3-25 Φ
(All dimensions are in mm)

Fig 1 (not to the scale)

3+3+4+2

UNIT - II

- 2 (a) How do the following parameters affect the bond strength of a R.C. section :
- Diameter of main-reinforcing bars
 - Nature of force in main reinforcement
 - Type of reinforcement
 - Amount of reinforcement.

6

- (b) Design a simply supported R.C.C. slab for a hall having clear dimensions of 4 m \times 10 m with 230 mm thick walls all-round. Use M-20 and Fe-415. Take live load = 4 kN/m² and floor finish = 0.6 kN/m². Give the neat plan and section showing reinforcement details.

8+2

OR

- 2 (a) Differentiate between short-term deflection and long term deflection.

4

- (b) A reinforced concrete beam of rectangular section of 300 mm width and 550 mm overall depth is reinforced with 6 bars of 20 mm ϕ placed at an effective cover of 50 mm. Out of 6 bars, 3 bars are bent up at 45 $^\circ$ near the support. Design the shear reinforcement at the support for an ultimate shear of 300 kN. Use M20 and Fe-415. Give the neat longitudinal section and cross section (at support) showing details of reinforcement.

10+2

UNIT - III

- 3 Determine and provide +ve and -ve reinforcement along short and long span for the following two way slab :
- Effective span : $4\text{m} \times 6\text{m}$
 Edge Condition : Two adjacent edges continuous
 Materials : M-20 and Fe-415
 Thickness of Slab : 170 mm
 Effective depth along shorter span = 145 mm
 Design ultimate load on the slab (including self weight) = 15 kN/m^2 .
 Show the reinforcement detail in plan.
 Also design the torsion reinforcement at corner.

12+4

OR

- 3 (a) Discuss the advantage and disadvantage of using flat slab. 5
- (b) Discuss the limitations of direct design method of flat slabs. 5
- (c) Describe the provision of torsion reinforcement in a two way slab. Give the neat schematic diagram showing the placement of torsion reinforcement. 6

UNIT - IV

- 4 Design a helically reinforced circular column of 300 mm diameter to support an axial factored load of 1500 kN. The column has unsupported length = 3 m and is effectively held in position at both ends but no restrained against rotation. First ensure the applicability of Codel formula for this case by ensuring the minimum eccentricity and slenderness ratio.

16

OR

- 4 (a) Differentiate between short column and long column and their structural behaviour.
- (b) Discuss the salient features of P_u - M_u interaction curve and its use.
- (c) Describe the assumptions made for limit state design of columns failing under pure compression.
- (d) "Load carrying capacity of helically reinforced column is more than that of column with lateral ties" why, explain clearly.

4×4

UNIT - V

- 5 (a) Differentiate between "isolated footing" and "combined footing".
(b) Design a suitable footing for a 400×400 mm column which is subjected to a service load of 1000 kN. Use M-20 and Fe415 and assume safe bearing capacity of the soil = 200 kN/m^2 . Sketch the details of reinforcement.

OR

- 5 (a) Write short note on the following :
(i) One way shear and punching shear
(ii) Circular raft foundation.

8

- (b) Determine the plan area of the combined footing supporting two columns of sizes 400×400 mm and 600×600 mm carrying the service loads of 1200 kN and 1800 kN respectively. The projection of the footing parallel to the length of the footing beyond the axis of the column of size 400×400 mm is restricted to 0.75 m. Ensure the condition that the resultant column load should act at the centroid of the foundation plan.

8

5E3153

Roll No. : _____

Total Printed Pages : 4

5E3153

B. Tech. (Sem. V) (Main/Back) Examination, December - 2013
Civil Engg.
5CE3 Steel Structure - I

Time : 3 Hours]

[Total 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. I.S. 800-2007

2. Steel Tables or I.S. Hand Book of Struc. Engg.

UNIT - I

- 1 (a) Design a bolted joint for two plates of size 90 mm × 12 mm and 90 mm × 16 mm, so as to transmit a factored load of 70 kN. Use bolts of grade 4.6 and Fe-410 for plates. 6
- (b) A 10 mm thick bracket is bolted to the flange of a column ISHB 300 @ 577 N/m, as shown in Fig 1. The factored load 200 kN is eccentric by 300 mm. Using M20 bolts of grade 4.6, design the connection.

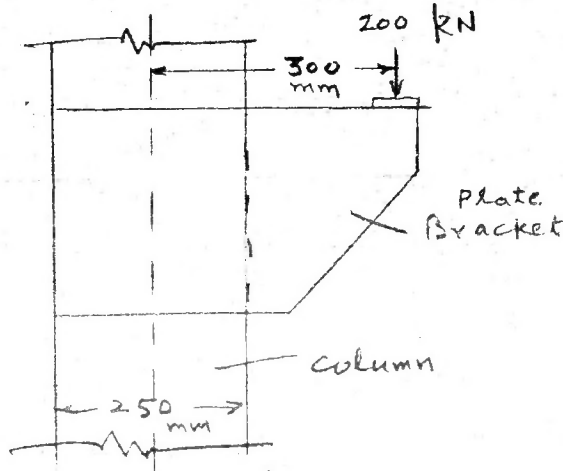


Fig 1.

OR



- 1 (a) A tie member of a steel roof truss has section ISA 80 × 80 × 10 mm. It is to be welded to a gusset plate 8 mm thick. Design the connection using only side welds to transfer an axial factored load of 150 kN.

6

- (b) Calculate the size of weld required to support a factored load of 120 kN applied at a distance of 150 mm from the edge of the flange of column, on a plate bracket as shown in Fig.2.

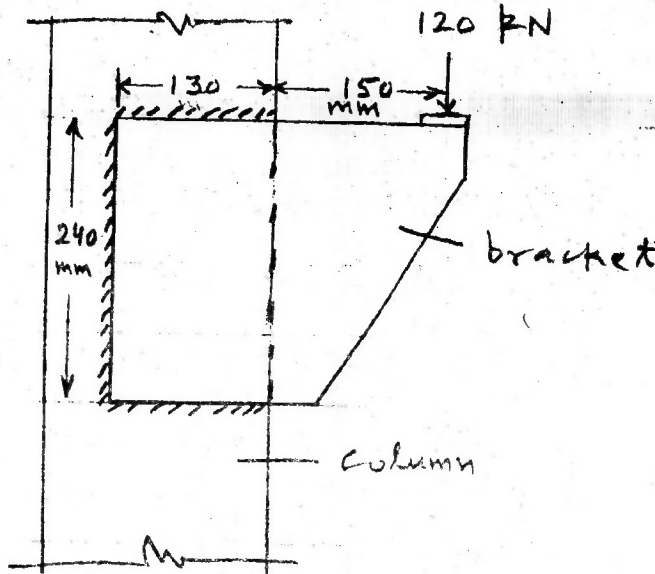


Fig 2.

10

UNIT - II

- 2 (a) A discontinuous strut used in a truss has length 1.85 m between centres of connections. Design an equal angle section for this to carry a force of 100 kN.

6

- (b) A column used in a steel building has section ISHB 200 @ 37.32 kg/m with one cover plate of size 250 mm × 12 mm attached to each flange. The column is 3.5 m long with one end fixed and other hinged. Determine the maximum factored load it can carry.

10

OR

- 2 Design a built up column, for an axial factored load of 1400 kN, if it is 4.5 m in height with both ends hinged. Use two channels placed back to back. Also design a single system of lacings for the column.

16



UNIT - III

- 3 A beam of effective span 6 m is simply supported at the ends. It is subjected to a uniformly distributed load (factored) of 30 kN/m, throughout the span. Design an I section for the beam if its compression flange is laterally supported. Apply checks for shear and deflection.

16

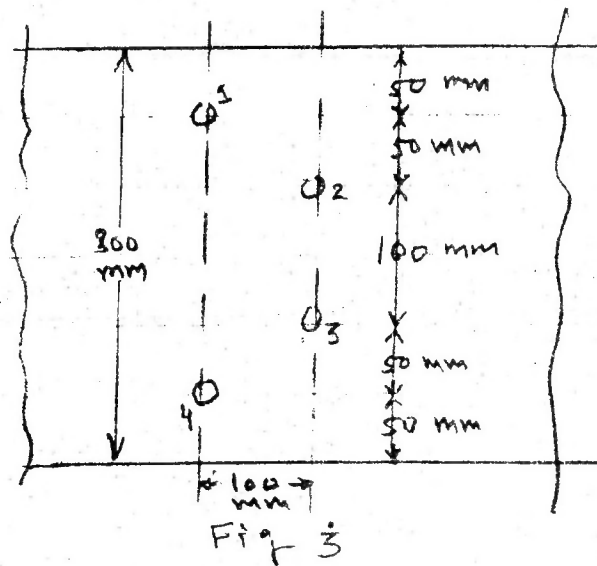
OR

- 3 Design a two tier grillage foundation for a column ISHB 350 @ 67.44 kg/m carrying a factored axial load of 1700 kN. The steel base plate under it measures 600 mm × 600 mm. Take safe bearing capacity of the soil as 170 kN/m².

16

UNIT - IV

- 4 (a) A plate section 300 mm × 12 mm has four staggered bolts of 20 mm dia. as shown in Fig. 3. Locate the critical section and find net area along it.



6

- (b) The main tie of a steel roof truss is subjected to a tensile force of 300 kN. Design the section by using two unequal angles. Use 18 mm bolts of grade 4.6.

10

OR

- 4 (a) Discuss the function of Column Bases. How gusseted base differs from slab base ?

6



- (b) Design a slab base for a column consisting of a single ISHB 300 @ 58.76 kg/m and carrying an axial factored load of 1500 kN. The column is supported on a concrete footing of mix M15.

10

UNIT - V

- 5 (a) Find shape factor of a triangular section.

6

- (b) A continuous beam ABCD is loaded as shown in Fig. 4. Taking load factor as 1.75, determine the value of M_p for which it may be designed as uniform section.

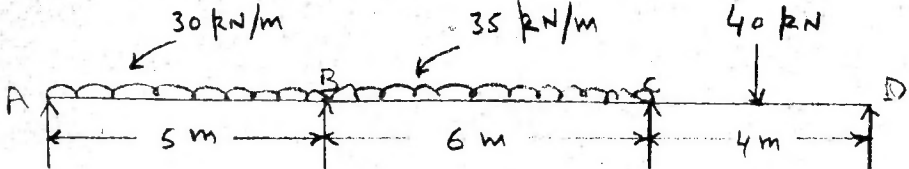


Fig 4

10

OR

- 5 (a) What are three conditions which must be satisfied for a structure at collapse ? Explain them.

6

- (b) Compute the value of true collapse load for the portal frame loaded as shown in Fig.5.

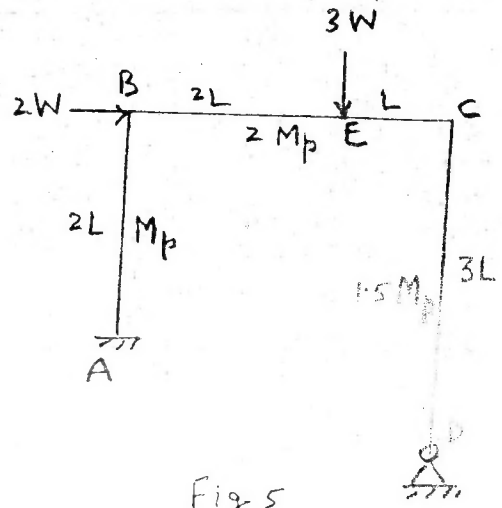


Fig 5

10



5E3154

Roll No. : _____

Total Printed Pages : **4****5E3154**

B. Tech. (Sem. V) (Main/Back) Examination, December - 2013
Civil Engg.
5CE4 Surveying - II

Time : 3 Hours]

[Total 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

1 (a) Explain the method of determining the R.L. of top of the tower by trigonometric leveling. The object is inaccessible and two instrument positions are in same vertical plane of object. Derive the expression for the same.

10

(b) Find the reduced level of station P from the given data.
 Distance between P&Q is 3650 m
 Angle of depression from Q to P = $2^{\circ} 47' 37''$
 Height of instrument at Q = 1.54 m
 Height of signal at P = 3.84 m
 Co-efficient of refraction $m = 0.07$
 Radius of earth (R) = 6370 km and RL of Q is 1230 m above mean sea level.

6

OR

1 (a) What are the essential corrections are required when level difference between two stations is found by trigonometric leveling. Also explain with neat sketch the magnitude of these corrections.

8

- (b) To determine the elevation of the top of a chimney, following observations were made.

<i>Inst. Stations</i>	<i>Angle of Elevation</i>	<i>Ready on BM</i>	<i>Remark</i>
A	10° 48' 20"	1.206	RL of BM
B	7° 12' 40"	1.086	248.362 m

Station A and B and the top of the chimney are in the same vertical plane. The distance between stations A and B is 50 m.

8

UNIT - II

- 2 (a) Enumerate the methods of setting out simple circular curve. Explain the method successive bisection of arcs of chords in detail.

8

- (b) Following data are given for setting out simple, circular curve by perpendicular offset from long chord.
 Radius of curve – 220 m, Deflection angle 55°
 Compute curve length, mid ordinate, length of long chord and offsets at 20 m interval from the centre of long chord. Put your answer in tabular form.

8

- 2 (a) What do you understand by super elevation ? How it is important in the design of highways and railway ? Explain how will you calculate super elevation for highways and railways.

8

- (b) Compute the necessary data for setting out simple circular curve by Rankine's tangential angle method if radius of curve is 240 m, deflection angle is 50° and chainage of point of intersection is 1290 m. Assume length of normal chord as 20 m.

8

UNIT - III

- 3 (a) Explain the different guide lines for selecting the triangulation stations.

8

- (b) The elevations of two stations A and B, 120 km apart are 220 m and 1000 m above mean sea level. The elevation of an intervening peak P, 80 km from A is 540 m. Check whether the two stations are intervisible or not? Find the height of signal at B if the two stations are not intervisible.

8

OR

- 3 (a) Explain what do you understand by strength of figure, its importance in triangulation and how it is computed.
- (b) Directions were measured from a satellite station S, 62.18 m from station C. Following were the observations $\angle A = 0^\circ 0' 0''$ $\angle B = 71^\circ 54' 32''$ $\angle C = 296^\circ 12' 2''$. The approximate lengths of AC and BC were 8240.6 m and 10863.6 m respectively. Calculate the angle ACB. Make a neat sketch of problem.

8

8

UNIT - IV

- 4 (a) Explain the followings with suitable examples :
- (i) Accidental Errors
 - (ii) Systematic Errors
 - (iii) Weight of an observation
 - (iv) Station Adjustment.
- (b) Following observations were taken in closed circuit leveling ABCDA from A and found that B was 6.71 m above A, C was 5.59 m above B, D was 3.48 m above C, D was 13.72 m above A. All observation are taken with equal accuracy. Determine the probable heights of B, C and D above by the method of correlates.

8

8

OR

- 4 What do you understand by figure adjustment? If you have to adjust any figure by method based on principle of least square, write condition equations in terms of correction and number of correlates to be assumed for following figures.
- (a) Braced Quadrilateral
 - (b) Triangle with central station
 - (c) Quadrilateral with central station.

UNIT - V

- 5 (a) Explain following astronomical terms with neat sketch :
- (i) Vertical Angle
 - (ii) Azimuth
 - (iii) Declination
 - (iv) Hour Angle
 - (v) Right Ascension
 - (vi) Celestial Horizon
 - (vii) Prime Vertical Circle
 - (viii) Observer Meridian.
- 8
- (b) Explain the Napler's Rule. How it can be used to obtain various astronomical quantities.
- 8

OR

- 5 (a) What are the different astronomical coordinate systems ? Explain independent coordinate system with the help of a neat sketch.
- 8
- (b) In order to determine the Azimuth of sun following observations were made
- Average corrected altitude of sun – $24^{\circ} 25' 30''$
- Average horizontal angle with reference – $100^{\circ} 27' 20''$
- The declination at the time of observation (δ) $22^{\circ} 17' 16.7''$ N
- The latitude of place is $25^{\circ} 10' N$
- Compute the Azimuth of sun and reference line.
- 8

- 2 (a) Enlist the different methods of Valuation. Explain in detail Land and building method. 7
- (b) Describe the term "Appropriation, Reappropriations and Completion certificate." 9.

UNIT - III

- 3 (a) • What are the factors to be considered for the preparation of Detailed estimate. 4
- (b) Explain the term :
 (i) Tool and Plant provision
 (ii) Departmental charges
 (iii) Floor Area. 6
- (c) Explain the role of a Valuer in a society. 6

OR

- 3 (a) Write down the Rate analysis for R.C.C. (1:2:4) in beams, slabs with 20 mm nominal size aggregate (excluding centering and shuttering). Assume suitable data. 10
- (b) Describe "Bar Bending Schedule". 6

UNIT - IV

- 4 (a) Prepare a rough cast estimate for the civil works required for a school requiring a total carpet area of 5000 sq. m. This includes the actual floor area required for class rooms, labs, offices and store etc. Suitable extra provision should be made for walls, verandahs, corridors, lavatories, stair case etc. The plinth area rates is Rs. 1500 per sq. m. for that area. Suitable extra provision may be made for special architectural features, water supply and sanitary connections, for internal power and electrical connections and for other services. 12

(b) Enlist the different percentage for different services in a house.

4

OR

4 (i) What is 'C.S.R.' ? What information does it gives ?

6

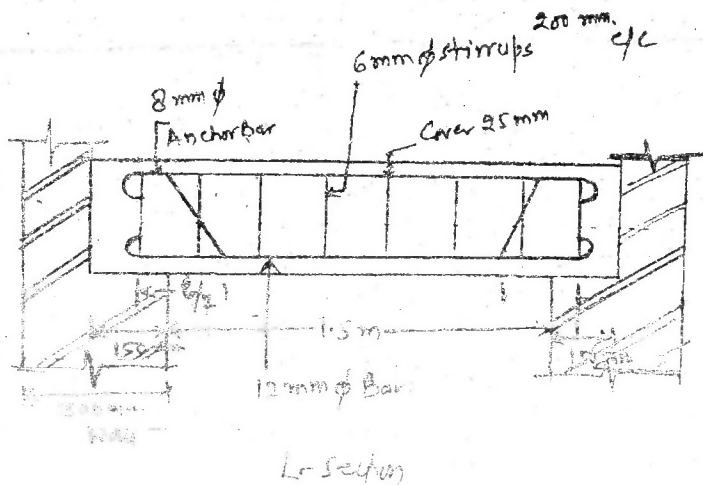
(ii) Write down the unit of measurement of the following :

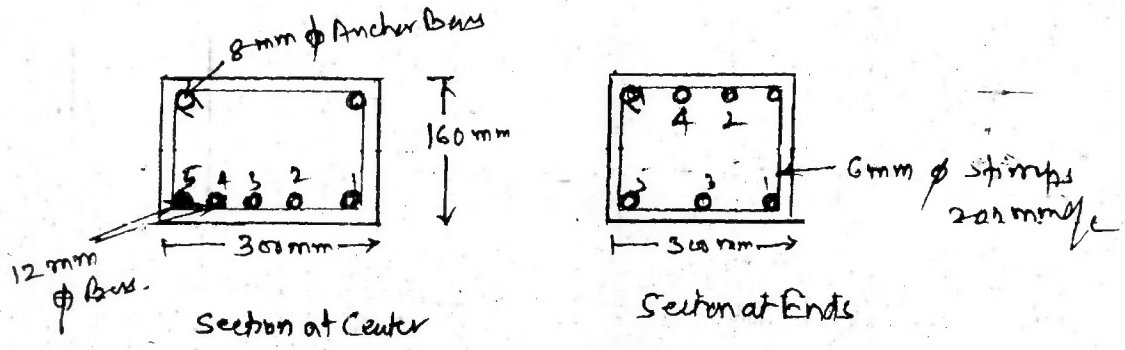
- (i) Hold fast
- (ii) Gusset plate
- (iii) Tar felting
- (iv) Barbed wire fencing
- (v) Bolt and Nut
- (vi) Railing (height and type specified)
- (vii) Bending, Binding and Placing of reinforcement
- (viii) Roof with C.G.I. sheet
- (ix) 40 mm thick D.P.T.
- (x) Jungle clearance.

10

UNIT - V

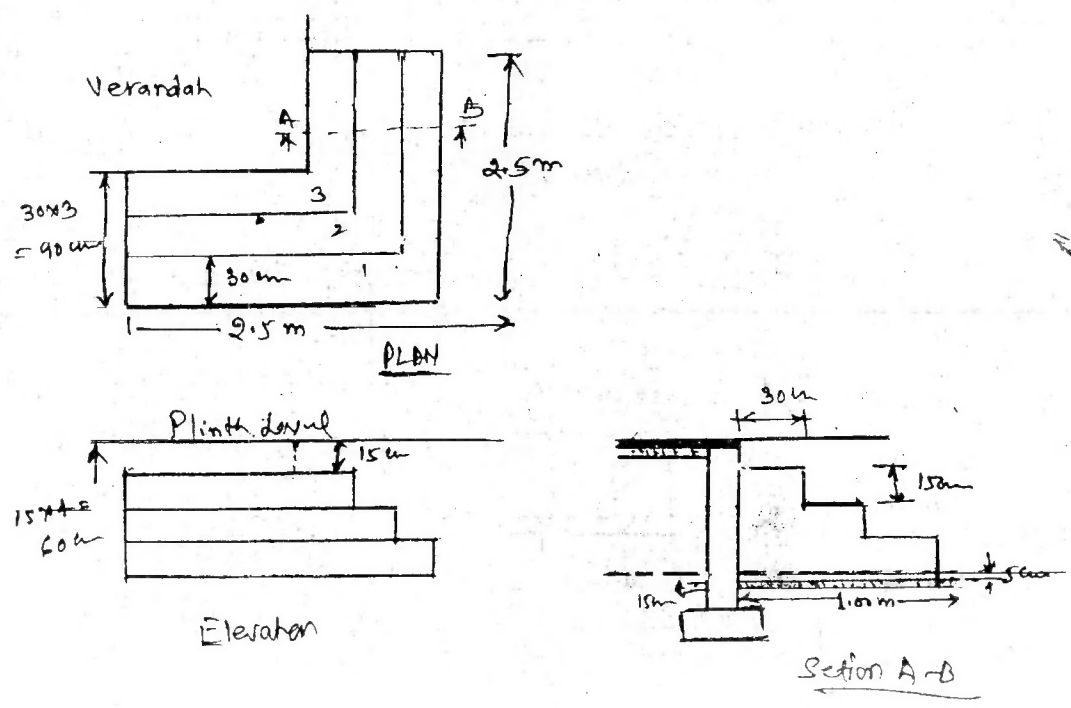
5 Find the quantities of steel in a lintel over an opening from the given drawings shown in Fig (Also draw schedule of bars)





OR

- 5 Estimate the following items with the help of Fig. given below. Assume other data, if required.
- (i) Earth work in excavation
 - (ii) Concrete in foundation
 - (iii) Brick work
 - (iv) 20 mm cement plinth



5E3158	Roll No. : _____	Total Printed Pages : 3
	5E3158	

B. Tech. (Sem. V) (Main/Back) Examination, December - 2013
Civil Engg.
5CE6.3 Solid Waste Management

Time : 3 Hours]

[Total 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

- 1 (a) Discuss various problems of site selection for municipal solid waste. 8
- (b) Discuss importance of solid waste management. 8

OR

- 1 (a) Classification of solid waste and how the classification will help in deciding disposal method. 8
- (b) Explain how the quantity and quality of solid waste varies with respect to different factors. 8

UNIT - II

- 2 (a) Discuss problems of on site handling and storage of solid waste. 8
- (b) Discuss the problems of house storage and community bins. 8

OR

[Contd...

- 2 (a) How to decide the location of community container in dense urban area ? 8
- (b) Discuss process of onsite storage and processing of municipal solid waste. 8

UNIT - III

- 3 (a) Discuss different system of solid waste collection. 8
- (b) Discuss the use of different equipments in collection of municipal solid waste. 8

OR

- 3 (a) The minimum requirement of labour in each type of collection system without use of equipments in collection. 8
- (b) What is the need of transfer ? What are the factors to be consider in selection of transfer station ? 8

UNIT - IV

- 4 (a) What is sanitary land filling ? Explain in detail. 8
- (b) Discuss selection of disposal system with respect to quality and quantity of municipal solid waste. 8

OR

- 4 (a) Explain incineration method of disposal of municipal solid waste. 8
- (b) What do you understand by bioremediation ? Explain in detail. 8



UNIT - V

- 5 (a) Discuss methods of disposal of industrial solid waste. 8
- (b) Explain reuse of industrial waste with examples. 8

OR

- 5 Write short notes on any four of the following :
- (a) Generation of energy from solid waste
 - (b) Secured land fill
 - (c) Recovery from industrial solid waste
 - (d) Treatment of industrial solid waste
 - (e) Recycle of industrial solid waste
 - (f) Nature of solid waste generated from industries.

16

The first part of the report is devoted to a general survey of the situation in the country.

The second part contains a detailed account of the work done during the year.

The third part is a summary of the results of the work.

The fourth part contains a list of the names of the persons who have assisted in the work.

The fifth part is a list of the names of the persons who have assisted in the work.

The sixth part is a list of the names of the persons who have assisted in the work.

The seventh part is a list of the names of the persons who have assisted in the work.

The eighth part is a list of the names of the persons who have assisted in the work.

The ninth part is a list of the names of the persons who have assisted in the work.

The tenth part is a list of the names of the persons who have assisted in the work.

5E3151

Roll No. : _____

Total Printed Pages : **6****5E3151**

B. Tech. (Sem. V) (Main/Back) Examination, December - 2013
Civil Engineering
5CE1 Theory of Structure

Time : 3 Hours]

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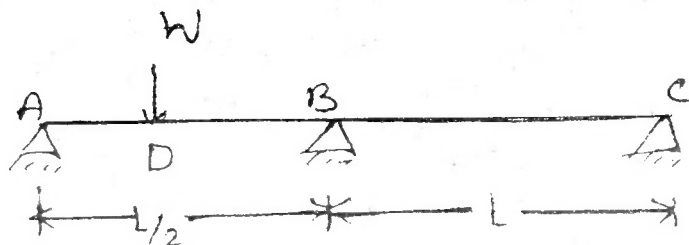
Use of following supporting material is permitted during examination.
 (Mentioned in form No. 205)

1. NIL2. NIL**UNIT - I**

- 1 (a) Define following briefly :
- Static indeterminacy
 - Kinematic indeterminacy
 - Maxwell's Reciprocal theorem
 - Betti's theorem.

8

- (b) A continuous beam ABC is loaded as shown in Fig. Determine all reactions and draw bending moment and shear force diagram.



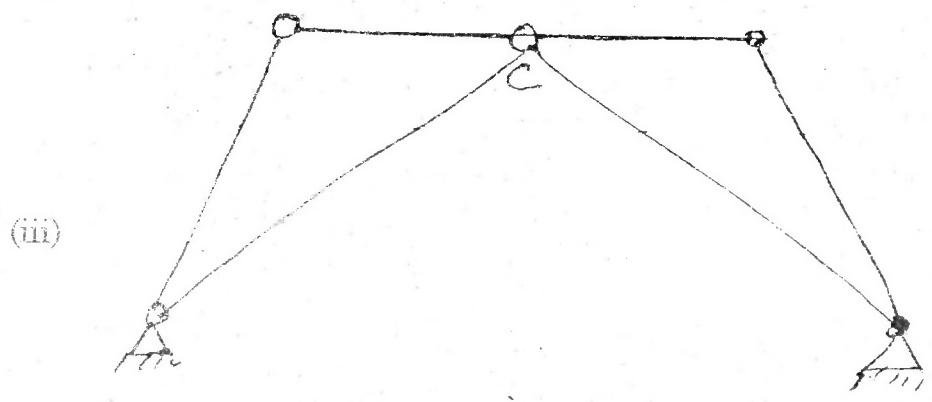
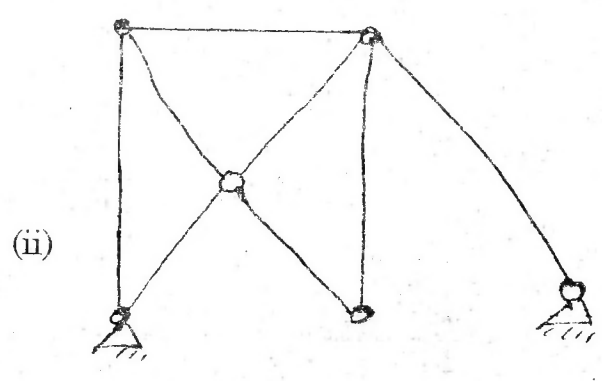
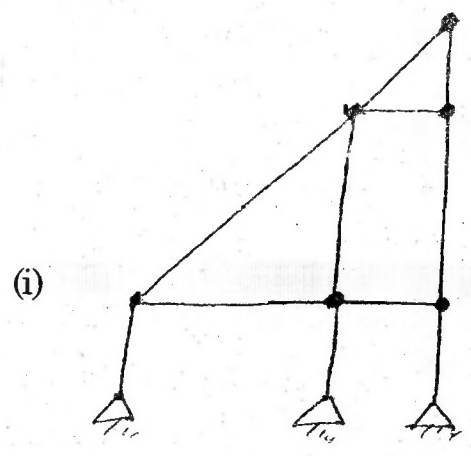
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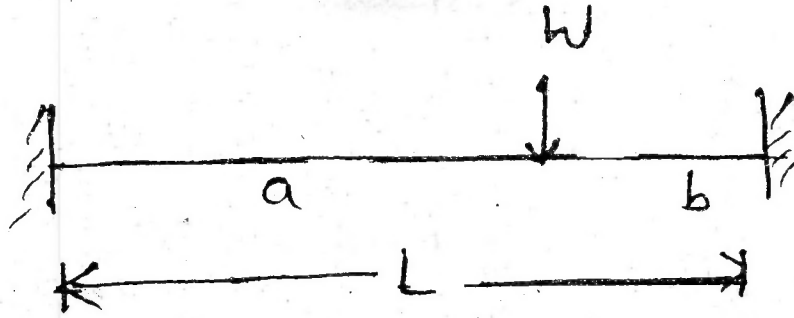


1 (a) Find out total degree of indeterminacy of following :

8

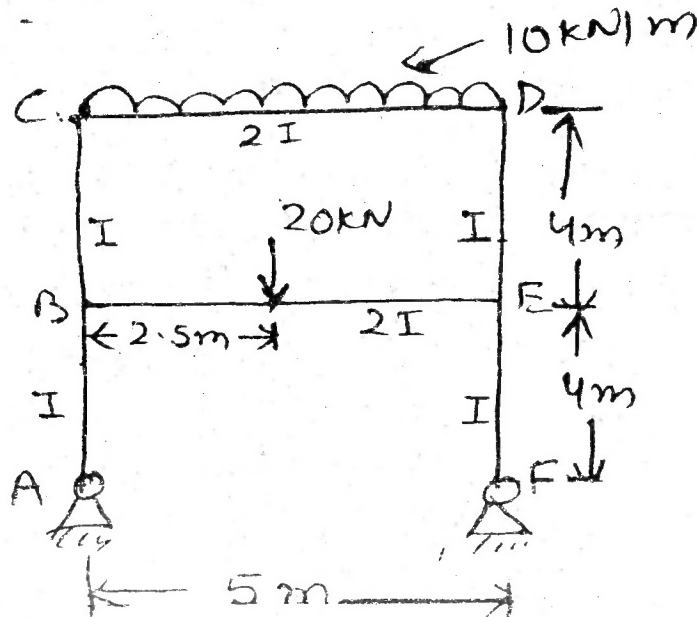


- (b) Discuss application of Area moment method. Also find out fixing End moment for following beam.



UNIT - II

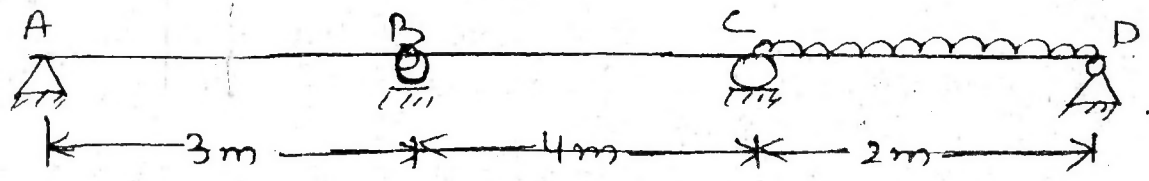
- 2 By using slope deflection method analyze the given frame.



OR



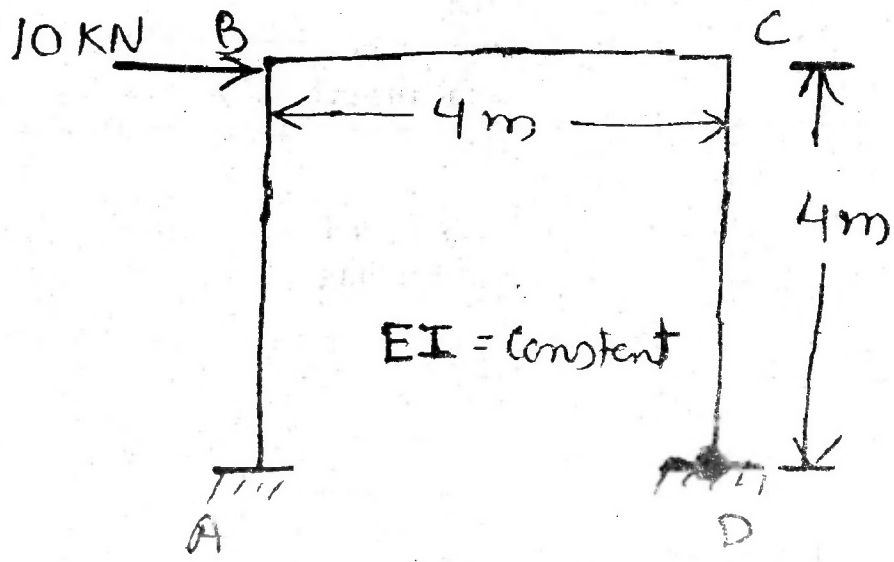
2 By using moment distribution method analyze the given continuous beam.



Given → sinking of support B by 25 mm
 $I = 6 \times 10^6 \text{ mm}^4$, $E = 200 \text{ kN/mm}^2$

UNIT - III

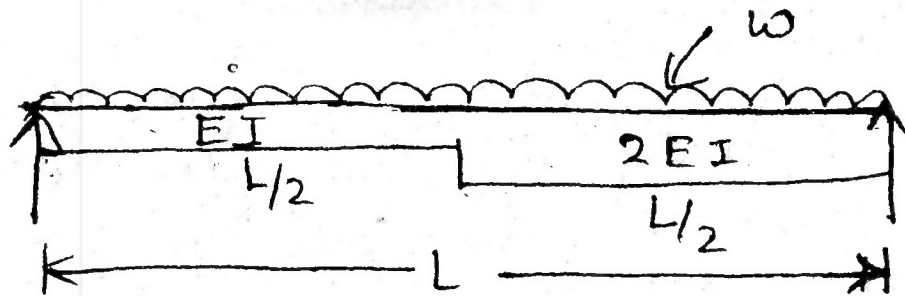
3 Analyze the frame by column analogy method.



OR



- 3 Find out the support reactions using conjugate beam method.



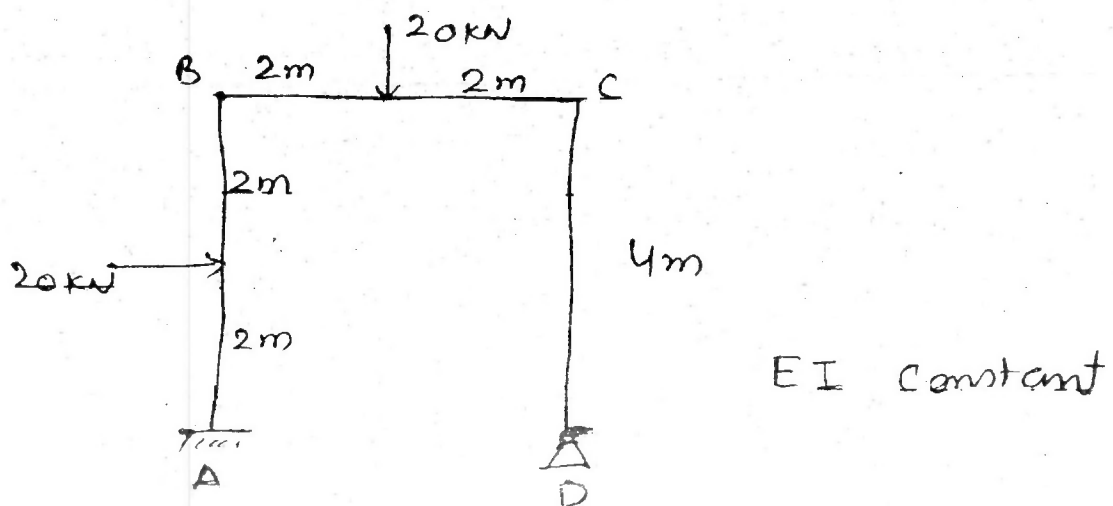
16

UNIT - IV

- 4 (a) State Castigliano's first and second theorem.

4

- (b) Find out for given frame by using min. strain energy theorem.

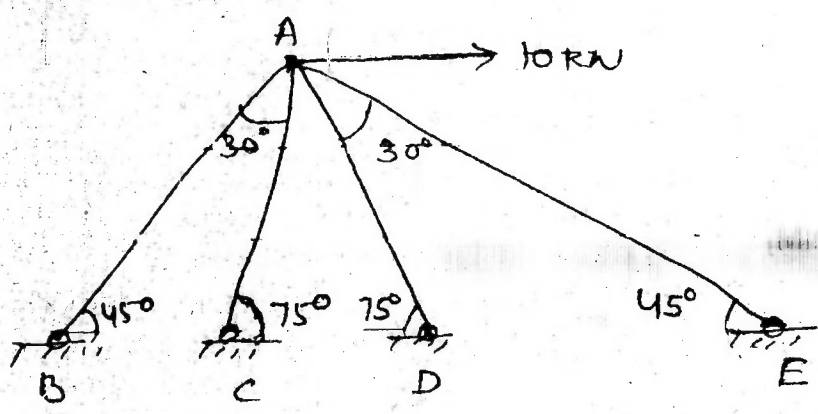


12

OR



- 4 Find the forces in all the members of the frame shown in Figure. All the bars are of same area of cross section and are of same material.

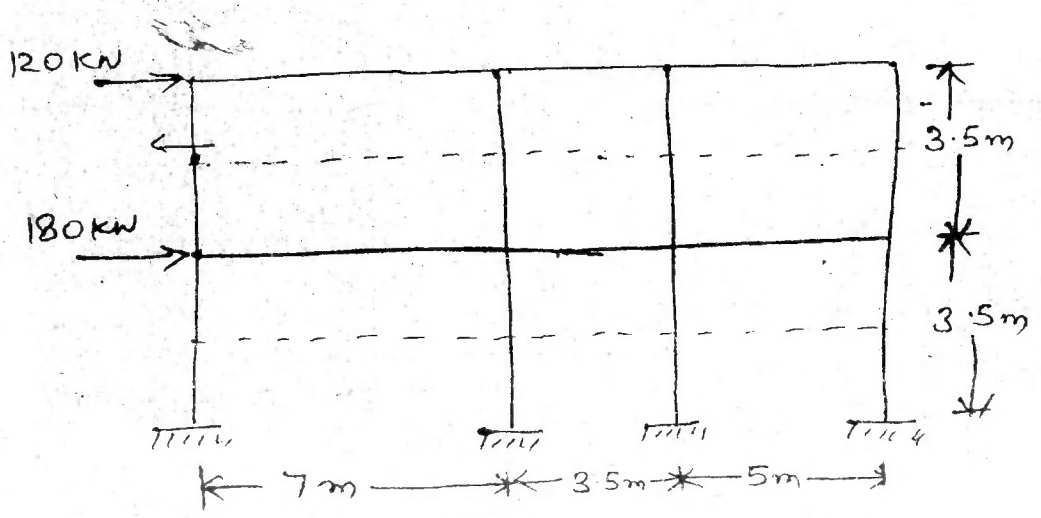


16

UNIT - V

- 5 (a) Discuss about analysis of frames subjected to horizontal forces and also methods of analysis.
- (b) Analyze the frame by cantilever method, assuming that all the columns have same area of cross section.

4



12

OR

- 5 Analyze the frame given above by Portal method.

16



