

CBCS SCHEME

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BCV701

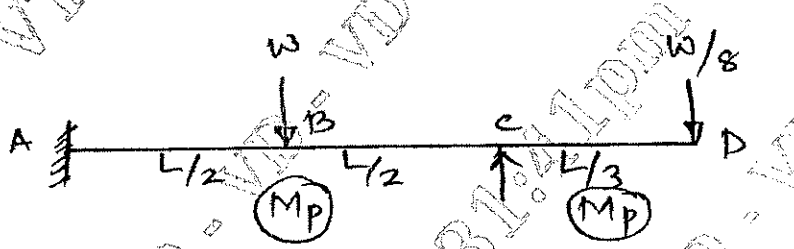
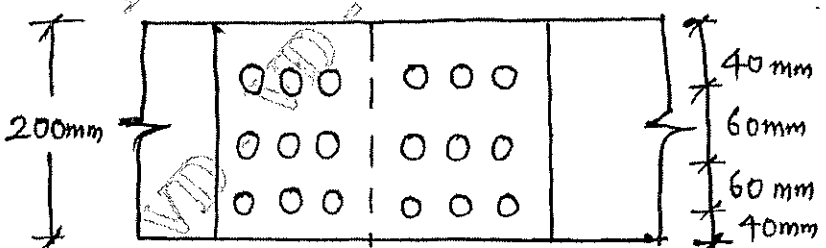
Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026

Design of Steel Structures

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
 2. M : Marks , L: Bloom's level , C: Course outcomes.
 3. Use of IS-800-2007 code and steel table is permitted.
 4. Assume any missing data suitably.*

Module – 1			M	L	C
Q.1	a.	List out the advantages and disadvantages of steel structures.	10	L2	CO1
	b.	Explain the principles of limit state of design in steel structures.	10	L2	CO1
OR					
Q.2	a.	State upper bound, lower bound and uniqueness theorems.	10	L2	CO1
	b.	A propped cantilever ABCD is loaded as shown in Fig.Q.2(b). Find the collapse load if the beam is of uniform cross section.	10	L2	CO1
 <p style="text-align: center;">Fig.Q.2(b)</p>					
Module – 2					
Q.3	a.	Explain the different failure modes of a bolted joint with neat sketches.	8	L2	CO2
	b.	A double cover butt joint is used to connect two flats of 200 ISF10 with 8 mm cover plates. The two plates are connected by 9 bolts in chain bolting at a pitch of 60 mm and edge distance of 40 mm. The bolts are arranged in 3 rows with 3 bolts in each row as shown in Fig.Q.3(b). Determine the strength and efficiency of the joint. The diameter of the bolts used is 20 mm. Assume property class of bolt as 4.6.	12	L3	CO2
 <p style="text-align: center;">Fig.Q.3(b)</p>					
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OR

Q.4	a.	List out the advantages and disadvantages of bolted connections.	8	L2	CO2
	b.	Find the efficiency of a lap joint as shown in Fig.Q.4(b). Assume M_{20} bolts of grade 4.6 and Fe-410 grade of steel plate.	12	L3	CO2

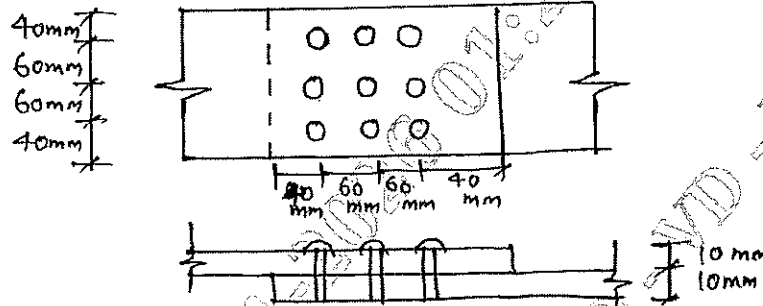


Fig.Q.4(b)

Module – 3

Q.5	a.	With neat sketches, explain types and properties of welds.	6	L2	CO2
	b.	A tie member of a roof truss consists of 2ISA (100 × 75 × 8) mm angles. The angles are connected to either side of a 10 mm thick gusset plate and the member is subjected to a working load of 300 kN. Design the welded connections and assume the connections are made in the workshop.	14	L3	CO2

OR

Q.6	a.	What are the advantages and disadvantages of welded connections?	8	L2	CO2
	b.	Determine the maximum load that can be resisted by the bracket as shown in Fig.Q.6(b) by fillet weld of size 6 mm.	12	L3	CO2

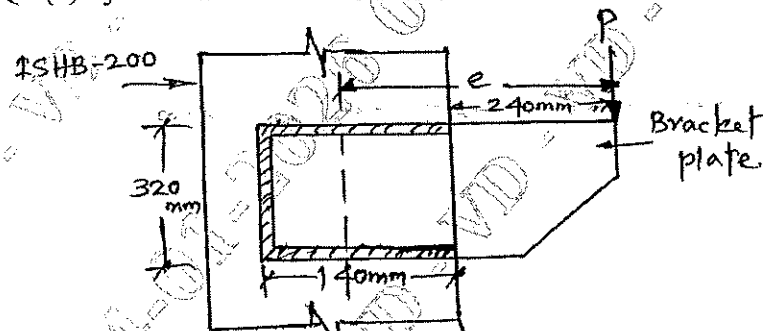


Fig.Q.6(b)

Module – 4

Q.7	a.	Explain the different modes of failure in tension member.	8	L2	CO4
	b.	Design a single angle section for a tension member of a roof truss to carry a factored load of 175 kN. The member is subjected to the possible reversal of stresses due to the action of wind. Use M_{20} black bolts of grade 4.6 for the connection and Fe410 grade steel. Draw the connection details.	12	L4	CO4

OR

Q.8	a.	With neat sketches explain the different types of column bases.	6	L2	CO4
	b.	Design a suitable slab base for a column carrying an axial factored load of 1000 kN. The column section is of ISHB-250 @ 537 N/m. Use M ₂₀ grade concrete pedestal and 6 mm size of the weld. Also design concrete foundation using safe bearing capacity of soil as 200 kN/m ² .	14	L4	CO4
Module 5					
Q.9	a.	Determine the design axial load capacity of a column ISHB 300 @ 577 N/m, if the length of column is 3 m and its both ends are pinned.	8	L3	CO5
	b.	Design a single angle strut connected to the gusset plate to carry an axial factored load of 180 kN. The length of the strut between centre to centre intersection is 3 m.	12	L4	CO5
OR					
Q.10		Design a built up column consisting of two channels placed back to back of length 10 m to carry an axial factored load of 1400 kN. The column may be assumed to have restrained in position but not in direction at both the ends.	20	L4	CO5

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BCV702

Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026 Estimation and Contract Management

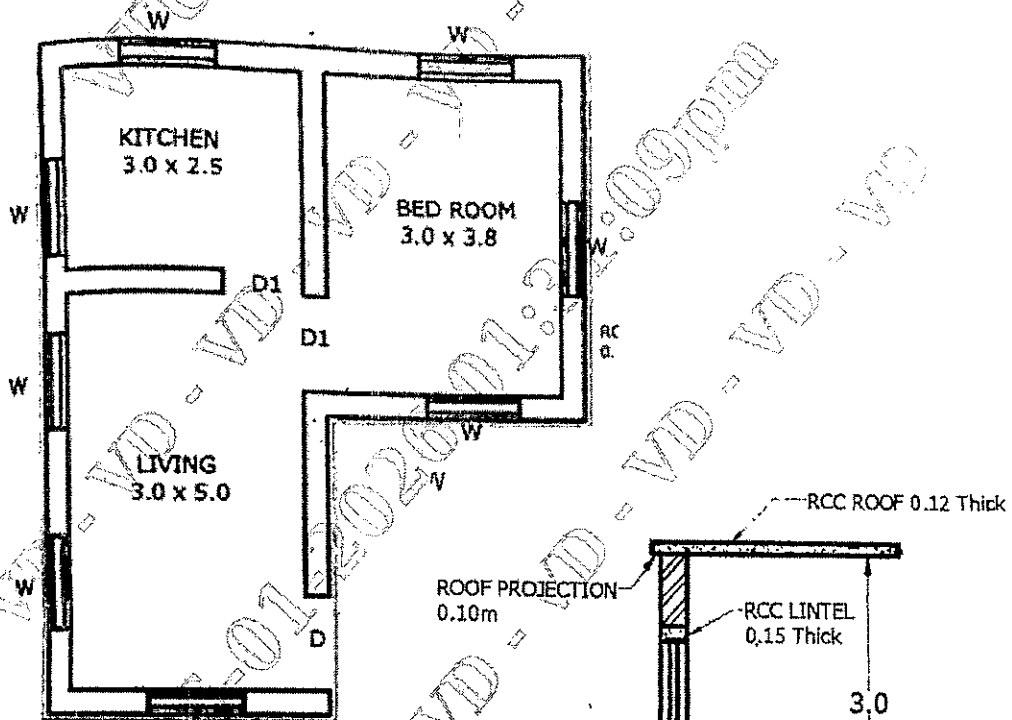
Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. M : Marks , L: Bloom's level , C: Course outcomes.

Module - 1		M	L	C
1	The details of two room building is shown in Fig.Q1. Estimate the quantities and cost of the following items of work : i. Earthwork in excavation at 450 Rs/m ³ ii. UCR Masonry in CM 1 : 6 in foundation and plinth at 5000 Rs/m ³ iii. Brickwork in CM 1 : 5 in superstructure of 30 cm wall at 7000 Rs/m ³ .	20	L3	CO1



NOTE:
 D = 1.2 x 2.1
 D1 = 1.0 x 2.1
 W = 1.2 x 1.5

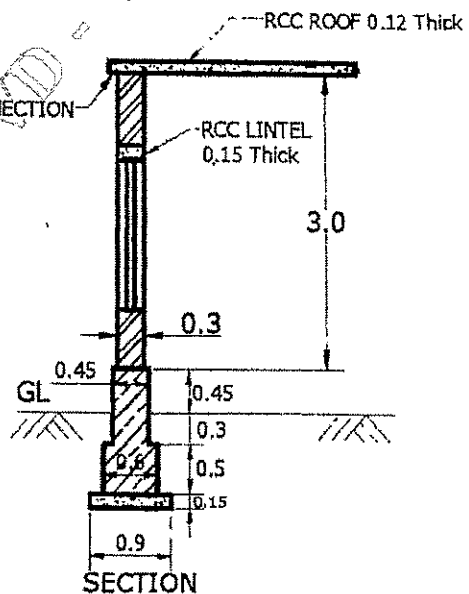


Fig.Q1
1 of 3

OR

2	What are the different types of Estimate? Explain in detail, any four different types of estimates.	20	L2	CO1
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Module - 2

3	<p>The details of Manhole is given in Fig.Q.3. Estimate the quantities of the following items :</p> <ul style="list-style-type: none"> i. Earthwork Excavation in foundation ii. PCC 1 : 4 : 8 for bed concrete iii. BBM in CM 1 : 4 for side walls iv. RCC 1 : 1½ : 3 for cover slab. 	20	L3	CO2
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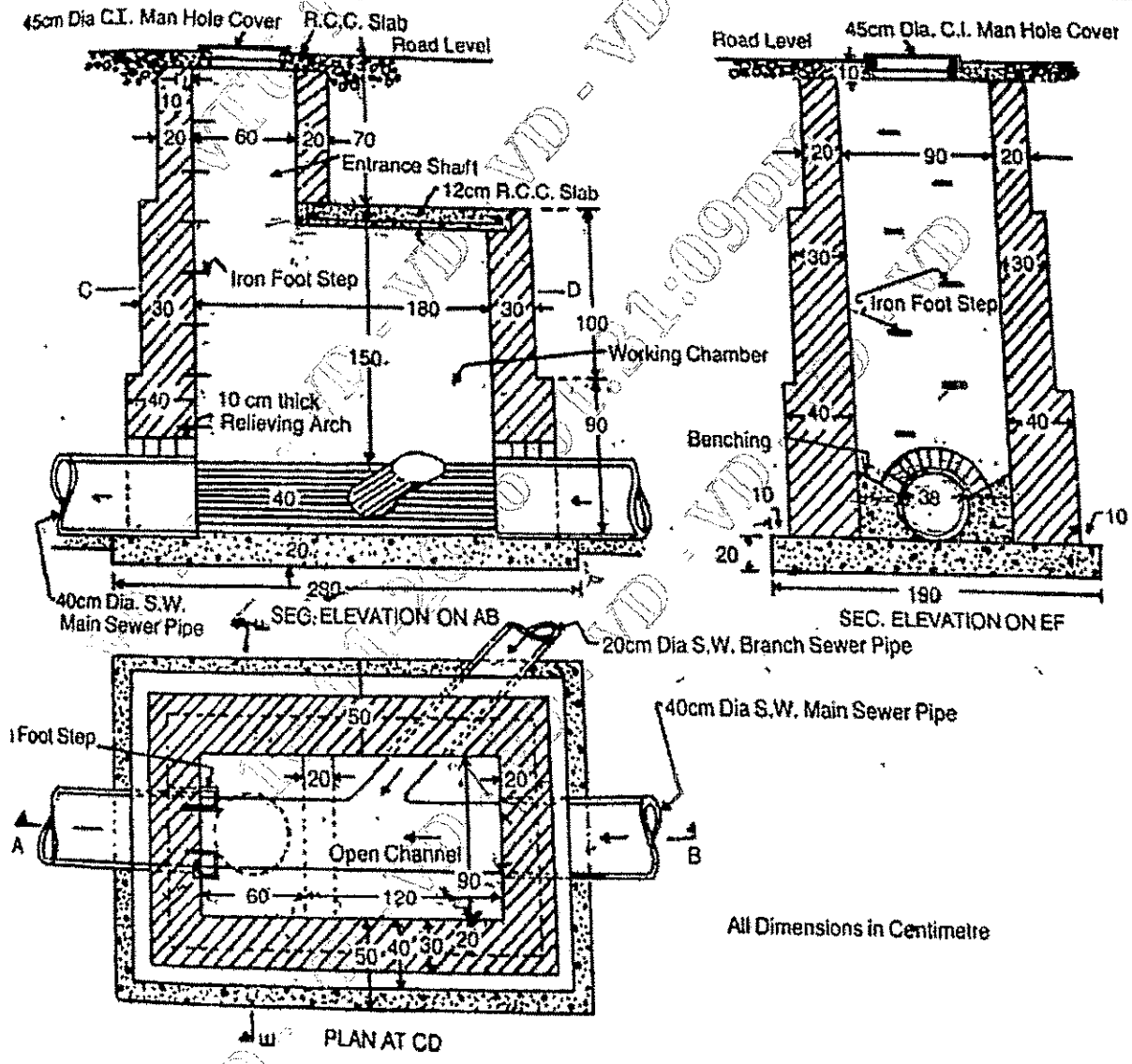


Fig.Q.3
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OR

4	Estimate the cost of Earthwork for a portion of road for 400 m length from the following data : Formation width of the road is 10 m, Side slopes are 2 : 1 in banking 1½ : 1 in cutting.	20	L3	CO2				
					Station	Distance in meter	RL of Ground	RL of formation
					25	1000	51.00	52.00
					26	1040	50.90	
					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						

Downward Gradient of 1 in 200

Module – 3

5	Write detailed specification for the following: i. Earthwork excavation for foundation ii. First class Brick work in CM 1 : 6 iii. Plastering work in CM 1 : 6, 12 mm thick iv. RCC 1 : 2 : 4 in roof slab.	20	L2	CO3
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OR

6	Carryout the rate analysis for the following : i. CC 1 : 4 : 8 for foundation bed ii. First class brickwork in CM 1 : 6 in superstructure iii. 12 mm thick cement plastering in CM 1 : 6 iv. RCC 1 : 2 : 4 for roof slab.	20	L2	CO3
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Module – 4

7	List the types of contract. Briefly explain any three types of contract.	20	L2	CO4
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OR

8	Write short notes on : i. Administrative Approval ii. Tender documents iii. E-Tendering System iv. Turnkey Operation.	20	L2	CO4
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Module – 5

9	Write short notes on : i. Liquidated Damages and Bonus ii. Measurement Book iii. Breach of Contract iv. Arbitration.	20	L2	CO5
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OR

10	a.	Define the terms : i) Valuation ii) Book value iii) Depreciation iv) Sinking fund.	10	L2	CO5
	b.	The building fetches a gross income of Rs. 1500/- per month. Workout the capitalized value on the basis of 6% net yield, if all out going amount is equal to Rs.3000/- per annum.			

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BCV703

Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026 Prestressed Concrete

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course-outcomes.
3. Use of IS:1343 is permitted.*

Module – 1			M	L	C
Q.1	a.	Define prestressed concrete. Mention it's applications.	07	L2	CO1
	b.	State the advantages and disadvantages of prestressed concrete.	08	L2	CO1
	c.	Explain the need for High strength concrete and High strength steel in PSC members.	05	L2	CO1
OR					
Q.2	a.	Write a short note on the historical development of PSC.	08	L2	CO1
	b.	Write a short note on the different types of prestressing steel.	06	L2	CO1
	c.	Discuss the role of design codes in psc structures.	06	L2	CO1
Module – 2					
Q.3	a.	List different types of losses in post tensioning system. Explain any two.	06	L2	CO2
	b.	A pre tensioned beam, 200 mm wide and 300 mm deep is prestressed by 10 wires of 7 mm diameter initially stressed to 1200 N/mm ² , with their centroids located 10 mm from the soffit. Find the maximum stress in concrete immediately after transfer, allowing only for elastic shortening of concrete. If concrete under goes a further shortening due to creep and shrinkage while there is a relaxation of 5% of steel stress, estimate final percentage loss of stresses using IS 1343 code and following data: E _s = 210 KN/mm ² , E _c = 5000 √fck fck = 42 N/mm ² , creep co-efficient (ϕ) = 1.6 Total residual shrinkage strain = 3 × 10 ⁻⁴	14	L4	CO2
OR					
Q.4	a.	Explain post tensioning anchorages devices and explain any one in details.	06	L2	CO2
	b.	Explain with sketch Hoyer's method of pretension system.	10	L2	CO2
	c.	Differentiate between mechanical, chemical and electrical prestressing methods.	04	L2	CO2
Module – 3					
Q.5	a.	Discuss briefly load balancing concept in PSC design.	08	L2	CO3
	b.	A concrete beam of symmetrical "I" section spanning 8 m, the width and thickness of flanges are 220 mm and 60 mm respectively, the overall depth of beam is 410 mm, thickness of web is 80 mm, the beam is prestressed by a straight cable with an eccentricity of 150 mm with effective force of 150 KN, the live load on the beam is 2.5 KN/m. Draw the stress distribution diagram at central section for the loaded beam.	12	L4	CO3
OR					
Q.6	a.	Explain stress distribution in End Block.	04	L2	CO3
	b.	Explain IS 1343 method for calculation of Bursting force.	04	L2	CO3
	c.	The end block of a post tensioned pre – stressed concrete beam 300 mm × 300 mm is subjected to a prestressing force 832.8 KN. Anchorage area 11720 mm ² . Design suitable anchorage reinforcement.	12	L4	CO3

Module – 4

Q.7	a.	Explain the types of prestressed concrete pipes.	10	L2	CO4
	b.	How is prestressing used in flat slab structures.	10	L2	CO4

OR

Q.8	a.	Describe the design considerations for one way slabs and two way slabs.	10	L2	CO4
	b.	Define partial prestressing and explain it's influence on serviceability and economy.	10	L2	CO4

Module – 5

Q.9	a.	Explain concept of composite construction in PSC Bridges.	10	L2	CO4
	b.	Explain the principle of balanced cantilever construction.	10	L2	CO4

OR

Q.10	a.	Explain the design procedure of a prestressed concrete T – girder bridge with cast in situ slab.	10	L2	CO4
	b.	Write short notes on Viaducts and Balanced cantilever bridges.	10	L2	CO4

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BCV714A

Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026 Intelligent Transportation System

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Define ITS and explain various applications of ITS in transportation.	10	L1	CO1
	b.	Describe rule and responsibilities of advanced traveller information system.	10	L2	CO1
OR					
Q.2	a.	Explain the advantages of adopting ITS over the conventional transportation system.	10	L1	CO1
	b.	Explain Fleet Oriented ITS Service.	10	L2	CO1
Module – 2					
Q.3	a.	Explain ITS architecture with the flow chart.	10	L1	CO2
	b.	List and explain the various hardware sensors used in ITS service.	10	L2	CO2
OR					
Q.4	a.	Discuss dynamic message sign in the context of traffic management.	10	L1	CO2
	b.	Write a note on : i) GPRS ii) GPS.	10	L2	CO2
Module – 3					
Q.5	a.	List and explain advantages and Automatic Numbers Plate Recognition [ANPR].	10	L2	CO2
	b.	Explain importance of control center in integrated traffic management system.	10	L3	CO2
OR					
Q.6	a.	Describe the different types of information provided by ATIS to road users.	10	L2	CO2
	b.	"The accuracy of DTA outputs depends on the integration of its core components". Discuss this statement with suitable examples.	10	L3	CO2
Module – 4					
Q.7	a.	Explain the difference between Pre Trip and En-route travel information with suitable example.	10	L2	CO3
	b.	Describe the basic components of ATIS and how they help travelers make informed decisions.	10	L3	CO3
OR					
Q.8	a.	How does a smart route system function in providing real time guidance to road users?	10	L2	CO3
	b.	Describe the process of data collection processing and dissemination in travel information systems.	10	L3	CO3
Module – 5					
Q.9	a.	What are Automated Highway System (AHS) and how do they function.	10	L2	CO3
	b.	What are the major challenges and opportunities for ITS implementation in developing countries?	10	L3	CO3
OR					
Q.10	a.	What is vehicle, Platooning in AHS and what are its advantages.	10	L2	CO3
	b.	Provide an overview of ITS implementations in developed counties.	10	L3	CO3
