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Note : Remove "Table of Content" before including in CP Book

Each Course Plan shall be printed and made into a book with cover page

Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

# 18CIV14 : ELEMENTS OF CIVIL ENGINEERING AND MECHANICS A. COURSE INFORMATION

#### 1. Course Overview

Degree:	BE	Program:	CIVIL
Year / Semester :	2018/1st	Academic Year:	2018-19
Course Title:	Elements of civil engineering and mechanics	Course Code:	18CIV14
Credit / L-T-P:	03	SEE Duration:	180 Minutes
Total Contact Hours:	40	SEE Marks:	60 Marks
CIA Marks:	40	Assignment	1 / Module
Course Plan Author:		Sign	Dt:
Checked By:		Sign	Dt:

#### 2. Course Content

Mod	Module Content	Teaching	Module	Blooms
ule	Module Content	Hours	Concepts	Level
1	Introduction to Civil Engineering Scope of different fields of Civil Engineering – Surveying, Building Materials, Construction Technology, Geotechnical Engineering, Structural Engineering, Hydraulics, WaterResources and Irrigation Engineering, Transportation Engineering, Environmental Engineering.1Infrastructure: Types of infrastructure, Role of Civil Engineer in theInfrastructural Development, Effect of the infrastructural facilities onsocio-economic development of a country. Introduction to Engineering Mechanics: Basic idealizations – Particle, Continuum and Rigid body; Newton's lawsBForce and its characteristics, types of forces-Gravity, Lateral and its distribution on surfaces, Classification of force systems, Principle of physical independence, superposition, transmissibility of forces, , Introduction to SI units.Couple, Moment of a couple, Characteristics of couple, Moment of a force, Equivalent force – Couple system; Numerical problems on moment of forces and couples, on equivalent force – couple system.	8	Scope of civil engineering, Resolution of Forces	Lavel L3
2	Concepts: Resultants and Equilibrium Composition of forces – Definition of Resultant; Composition of coplanar -concurrent force system, Parallelogram Law of forces, Principle of resolved parts; Numerical problems on composition of coplanar concurrent force systems. Equilibrium of forces – Definition of Equilibrant; Conditions of static equilibrium for different force systems, Lami's theorem; Numerical problems on equilibrium of coplanar – concurrent and non-concurrent force systems.Application- Static Friction in rigid bodies in contact Types of friction, Laws of static friction, Limiting friction, Angle of friction, angle of repose; Impending motion on horizontal and inclined planes;Numerical Problems on single and two blocks on inclined planes		Resultant of Concurrent forces, Friction and Equilibrium	L3
3	Support Reaction in beams Types of Loads and Supports, statically determinate beams, Numerical problems onsupport reactions for statically determinate beams with Point load (Normal and inclined) and uniformly distributed and uniformly varying loads and Moments. Types of trusses, analysis of statically determinate trusses using method of joints and method of section		Resolving of Support Reaction, Analysis of trusses	
4	Introduction to the concept, centroid of line and area, centroid of basic geometrical figures, computing centroid for– T, L, I, Z and full/quadrant circular sections and their built up sections. Numerical problems		Location of Centroid, Determination of Moment of	U U

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		Introduction to the concept, Radius of gyration, Parallel axis	Inertia	
		theorem, Perpendicular axis theorem, Moment of Inertia of		
		basic planar figures, computing moment of Inertia for – T, L, I, Z		
		and full/quadrant circular sections and their built up sections.		
		Numerical problems		
	-	Concepts and Applications Definitions – Displacement – Average velocity – Instantaneous velocity – Speed – Acceleration – Average acceleration – Variable acceleration – Acceleration due to gravity – Newton's Laws of Motion. D' Alembert's principle and its application in plane motion and connected bodies including pulleys	Kinematics, kinetics	L3
		connected bodies including pulleys		

#### 3. Course Material

Mod	Details	Available
ule		
1	Text books	
	Elements of civil engineering and mechanics by M.N.Shesha Prakash and Ganesh, 3 <sup>rd</sup> Revised edition	In Lib
	Elements of civil engineering and mechanics by S,S, Bhavikatti , New Age Internqtional Publisher,New Delhi,4th edition	In dept
2	Reference books	
	Elements of civil engineering and mechanics by B.K.Kholapuri and Ganesh, 3 <sup>rd</sup> Revised edition	In Lib
3	Others (Web, Video, Simulation, Notes etc.)	
		Not Available

#### 4. Course Prerequisites

0	5No	Course	Course Name	Module / Top	ic / Desc	ription	Sem	Remarks	Blooms
		Code							Level
	1		Elements of civil			thematics	1		L3
			engineering and	2.Knowledge of F	hysics				
			mechanics						

Note: If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

#### **B. OBE PARAMETERS**

#### 1. Course Outcomes

#	COs	Teach.	Concept	Instr	Assessmen	Blooms'
		Hours		Method	t Method	Level
CO1	Students should be able to describe	2	Scope of	BB,ppt	C.I.E,Unit	L2
	the scope of various fields of civil		civil		test,Assign	Understand
	engineering		engineering		ment	
CO2	Students should be able to illustrate	6	Resolution	BB	C.I.E,Unit	L3
	forces on couple system and moment		of Forces		test,Assign	Apply
	of forces				ment	
CO3	Students should be able to Calculate	4	Resultant of	BB,Tutori	C.I.E,Unit	L3
	the resultant of force system		Concurrent	al	test,Assign	Apply
	subjected to various load		forces		ment	
CO4	Students should be able to Apply laws	3	Friction and	BB	C.I.E,Unit	L3

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	of friction and types of friction		Equilibrium		test,Assign	Apply
					ment	
CO5	Students should be able to compute	3	Resolving of	BB,Tutori	C.I.E,Unit	L3
	the reactive force that develop as		Support	al	test,Assign	Apply
	result of external load		Reaction		ment	
CO6	Students should be able to calculate	5	Analysis of	BB	C.I.E,Unit	L3
	the trusses by method of joints and		trusses		test,Assign	Apply
	section				ment	
CO7	Students should be able to determine	4	Location of	BB,Tutori	C.I.E,Unit	L3
	centroid of built up section		Centroid	al	test,Assign	Apply
					ment	
CO8	Students should be able to calculate	4	Determinati	BB,Tutori	C.I.E,Unit	L3
	M.I of full/quadrant circular section		on of	al	test,Assign	Apply
			Moment of		ment	
			Inertia			
CO9	Students should be able to illustrate	6	kinematics	BB	C.I.E,Unit	L3
	relationship between motion of bodies				test,Assign	Apply
					ment	
CO10	Students should be able to describe	2	kinetics	BB	C.I.E,Unit	L3
	relationship between plane motion				test,Assign	Apply
	and connected bodies				ment	
-	Total	50	-	-	-	-

Note: Identify a max of 2 Concepts per Module. Write 1 CO per concept.

# 2. Course Applications

Application Area	CO	Level
Basic fields of civil engineering	CO1	L2
Resolve the forces acting on body	CO2	L3
Concurrent forces	CO3	L3
Equilibrium and friction	CO4	L3
Support reaction	CO5	L3
Analyzing the forces acting on trusses	CO6	L3
Calculating the area and center of gravity of geometric figures	CO7	L3
computing the radius of gyration of geometric figures	CO8	L3
Kinematics	CO9	L3
Kinetics	CO10	L3
	Basic fields of civil engineering Resolve the forces acting on body Concurrent forces Equilibrium and friction Support reaction Analyzing the forces acting on trusses Calculating the area and center of gravity of geometric figures computing the radius of gyration of geometric figures Kinematics	Basic fields of civil engineeringCO1Resolve the forces acting on bodyCO2Concurrent forcesCO3Equilibrium and frictionCO4Support reactionCO5Analyzing the forces acting on trussesCO6Calculating the area and center of gravity of geometric figuresCO7computing the radius of gyration of geometric figuresCO8KinematicsCO9

Note: Write 1 or 2 applications per CO.

# 3. Articulation Matrix

#### (CO - PO MAPPING)

-	Course Outcomes							Dutco						
#	COs	PO1	PO2	PO3	PO4	PO5	PO	PO7	PO	PO9	PO1	PO1	PO1	Level
							6		8		0	1	2	
	Students should be able to describe the scope of various fields of civil engineering		-	-	-	-	-	-	-	-	-	-	-	L2
	Students should be able to illustrate forces on couple system and moment of forces		-	-	-	-	-	-	-	_	-	-	-	L3
	Students should be able to Calculate the resultant of force system subjected to various load		-	-	-	-	-	-	-	-	-	-	-	L3
	Students should be able to Apply laws of friction and types of friction		-	-	-	-	-	-	-	-	-	-	-	L3
CO5	Students should be able to	2	-	-	-	-	-	-	-	-	-	-	-	L3

-	-	-	-	-	-	-	-	-	-	L3 L3
-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	L3
-	_									
		-	-	-	-	-	-	-	-	L3
-	-	-	-	-	-	-	-	-	-	L3
-	-	-	-	-	-	-	-	-	-	L3
	-									

## 4. Mapping Justification

Мар	ping	Justification	Mapping Level
CO	PO	-	-
CO1	PO1	Know basics of Civil Engineering, its scope of study	L1
CO2	PO1	Understand the fundamental principles of Mechanics	L3
CO3	PO1	Apply mechanics concepts for computing the resultant of Coplanar Force systems.	L3
CO4	PO1	Formulate and apply the conditions of static equilibrium to problems involving Coplanar Force systems	L3
CO5	PO1	Apply the concept and theory of Dry friction to simple problems involving static friction.	L3
CO6	PO1	Apply the concept and theory of reaction to simple problems of trusses	L3
CO7	PO1	Locate the centroidal distances of composite laminas	L3
CO8	PO1	Compute the moment of Inertia of different laminas	L3
CO9	PO1	Understand the basics of kinematics	L3
CO10	PO1	Express the relationship between motion of bodies	L3

Note: Write justification for each CO-PO mapping.

#### 5. Curricular Gap and Content

SNo	Gap Topic	Actions Planned	Schedule Planned	<b>Resources Person</b>	PO Mapping
1					
2					
3					
4					
5					

Note: Write Gap topics from A.4 and add others also.

#### 6. Content Beyond Syllabus

SNo	Gap Topic	Actions Planned	Schedule Planned	<b>Resources Person</b>	PO Mapping

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1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Note: Anything not covered above is included here.

## C. COURSE ASSESSMENT

#### 1. Course Coverage

Mod	Title	Teaching		No. of	f quest	ion in	Exam		CO	Levels
ule		Hours	CIA-1	CIA-2	CIA-3	Asg	Extra	SEE		
#							Asg			
1	Introduction to Civil Engineering	08	2	-	-	1	1	2	CO1,	L3
	&Engineering Mechanics								CO2	
2	Analysis of Concurrent Force	08	2	-	-	1	1	2	CO3,	L3
	Systems								CO4	
3	Analysis of Non-Concurrent Force	08	-	2	-	1	1	2	CO5,	L3
	Systems								CO6	
4	Centroids and Moments of Inertia of	08	-	2	-	1	1	2	CO7,	L3
	Engineering Sections:								C08	
5	Kinematics and Kinetics	08	-	-	4	1	1	2	CO9,	L3
									CO10	
-	Total	40	4	4	4	5	5	10	-	-

Note: Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

#### 2. Continuous Internal Assessment (CIA)

Evaluation	Weightage in Marks	СО	Levels
CIA Exam – 1	30	CO1, CO2, CO3, CO4	L2, l3, l3, L3
CIA Exam – 2	30	CO5, CO6, CO7, Co8	L3, L3, L3, L3
CIA Exam – 3	30	CO9, CO10	L3, L3
Assignment - 1	05	CO1, CO2, CO3, CO4	L2, l3, l3, L3
Assignment - 2	05	CO5, CO6, CO7, CO8	L3, L3, L3, L3
Assignment - 3	05	CO9, CO10	L3, L3
Seminar - 1	05	CO1, CO2, CO3, CO4	L2, l3, l3, L3
Seminar - 2	05	CO5, CO6,CO7,CO8	L3, L3, L3, L3
Seminar - 3	05	CO9, CO10	L3, L3
Other Activities – define – Unit tests		CO1 to Cog	L2, L3,
Final CIA Marks	40	-	-

Note : Blooms Level in last column shall match with A.2 above.

## D1. TEACHING PLAN - 1

#### Module - 1

ſ	Title:	Introduction to Civil Engineering & Engineering Mechanics	Appr	16 Hrs
			Time:	

1     describe the scope of various fields of civil engineering     CO1       2     illustrate forces on couple system and moment of forces     CO2       b     Course Schedule     -       Class No Module Content Covered     CO     L       1     Introduction to Civil Engineering, Structural Engineering, Hydraulus, Hydr	Blooms
2     Illustrate forces on couple system and moment of forces     CO2       b     Course Schedule     -       1     Introduction to Civil Engineering Scope of different fields of Civil Cou       2     Introduction to Civil Engineering, Structural Engineering, Hydraulics, WaterResources and Irigation Engineering, Iransportation Engineering, Environmental Engineering, Environment, Effect of the infrastructural Engineering (Environment Environment), Lateral and its distribution on surfaces, Equivalent force - couple system     Co1       7     Numerical problems on moment of forces and couples, on equivalent force - couple system     Co1       8     Numerical problems on moment of forces and couples, on equivalent force - couple system     Co1       9     Review Questions     -     Co1       1     Discuss briefly the role of Civil Engineers in the infrastructure	Level
b       Course Schedule         Itass No Module Content Covered       CO       L         1       Introduction to Civil Engineering Scope of different fields of Civil Engineering - Surveying, Building Materials, Construction Technology Geotechnical Engineering, Structural Engineering, Hydraulics, WaterResources and Irrigation Engineering, Transportation Engineering, Environmental Engineering       Co1         2       Infrastructure: Types of infrastructure, Role of Civil Engineer in theInfrastructura: Development of a country.       Co1         3       Introduction to Engineering Mechanics Basic idealizations - Particle Continuum and Rigid body, Newton's lawsBForce and its characteristics, types of forces-Gravity, Lateral and its distribution on surfaces.       Co1         5       Couple, Moment of a couple, Characteristics of couple. No equivalent force - couple system.       Co1         6       Numerical problems on moment of forces and couples, on equivalent force - couple system.       Co1         7       Numerical problems on moment of forces and couples, on equivalent force - couple system.       Co1         8       Numerical problems on moment of forces and couples, on equivalent force - couple system.       Co1         8       Review Questions       -       Co1             1       Basis fields of	L2
Ziass No Module Content Covered     CO     L       1     Introduction to Civil Engineering Scope of different fields of Civil Engineering. Environmental Engineering. Structural Engineering, Hydraulics, WaterResources and Irrigation Engineering, Transportation Engineering, Environmental Engineering.     Co1     Co1       2     Infrastructure: Types of infrastructure, Role of Civil Engineer in Co1     Co1     Co1       3     Introduction to Engineering Mechanics Basic idealizations – Particle, Co1     Co1       4     Classification of force systems, Principle of physical independence.     Co1       5     Couple, Moment of a couple, Characteristics of couple, Moment of a couple, Characteristics of couple, Moment of a couple, Characteristics of couple, Moment of a couple. Context of a couple characteristics of couple, Moment of a couple characteristics of couple, system.     Co1       6     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       7     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       8     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       9     Resolve the forces acting on body     Co1       1     Basic fields of vill engineering illop avement     Co1       2     Resolve the forces acting on body     CO2       <	L3
Lass No Module Content Covered       CO       L         1       Introduction to Civil Engineering Scope of different fields of Civil Engineering. Environmental Engineering, Structural Engineering, Hydraulics, WaterResources and Irrigation Engineering, Iransportation Engineering, Environmental Engineering.       Co1       Co1         2       Infrastructure: Types of infrastructure, Role of Civil Engineer in Co1       Co1       Co1         3       Introduction to Engineering Mechanics: Basic idealizations – Particle, Co1       Co1       Co1         4       Classification of force systems, Principle of physical independence, Superposition, transmissibility of forces, Introduction to SI units       Co1       Co1         5       Couple, Moment of a couple, Characteristics of couple, Moment of a couple, Characteristics of couple, Moment of a couple, Characteristics of couple, system.       Co1       Co1         6       Numerical problems on moment of forces and couples, on equivalent force - couple system.       Co1       Co1         7       Numerical problems on moment of forces and couples, on equivalent force - couple system.       Co1       Co1         8       Numerical problems on moment of forces and couples, on equivalent force - couple system.       Co1       Co1         9       Resolve the forces acting on body       Co1       Co1       Co2         1       Basic fields of vivi	_
1     Introduction to Civil Engineering, Scope of different fields of Civil Col Engineering - Surveying, Building Materials, Construction Technology, Geotechnical Engineering, Structural Engineering, Hydraulics, WaterResources and Irrigation Engineering, Transportation Engineering, Environmental Engineering, Transportation Engineering, Environmental Engineering, Editor, Role of Civil Engineer in theinfrastructural Development of a country.     Col       2     Infrastructural Development of a country.     Col       3     Introduction to Engineering Mechanics: Basic idealizations - Particle, Continuum and Rigid body, Newton's laws/BForce and its characteristics, types of forces-Gravity, Lateral and its distribution on surfaces.     Col       4     Classification of force systems, Principle of physical independence, Equivalent force - Couple system.     Col       5     Couple, Moment of a couple, Characteristics of couples, on equivalent force - couple system.     Col       6     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Col       7     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Col       8     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Col       1     Basic fields of civil engineering in body     Col     Col       2     Review Questions     -     Col       1     Discrus briefly the role of Civil Engineers in the	Level
2     Infrastructure: Types of infrastructure, Role of Civil Engineer in theInfrastructural Development, Effect of the infrastructural facilities consocio-economic development of a country.     Continuum and Rigid body: Newton's lawsBForce and its characteristics, types of forces-Gravity, Lateral and its distribution on surfaces.     Continuum and Rigid body: Newton's lawsBForce and its characteristics, types of forces-Gravity, Lateral and its distribution on surfaces.     Continuum and Rigid body: Newton's lawsBForce and its characteristics, types of forces-Gravity, Lateral and its distribution on surfaces.     Continuum and Rigid body: Newton's lawsBForce and its characteristics.       4     Classification of force systems, Principle of physical independence, superposition, transmissibility of forces, Introduction to SI units     Continuum and Rigid body: Newton's lawsBForce and couples, on equivalent force - couple system.     Continuem and Rigid body: Newton's lawsBForce and couples, on equivalent force - couple system.     Continuem and Rigid body: Newton's lawsBForce and couples, on equivalent force - couple system.     Continuem and Rigid body: Newton's lawsBForce and couples, on equivalent force - couple system.     Continuem and Rigid body: Newton's lawsBForce and couples, on equivalent force - couple system.     Continuem and Rigid body: Newton's lawsBForce and couples, on equivalent force - couple system.     Continuem and Rigid body: Newton's lawsBForce and couples, on equivalent force - couple system.     Continuem and Rigid body: Newton's lawsBForce and couples, on equivalent force - couple system.     Continuem and Rigid body: Newton's lawsBForce and couples, on equivalent force - couple system.     Continuem and Rigid body: Rigid body: Risid body: Rigid body: Rigid	L2
3     Introduction to Engineering Mechanics: Basic idealizations - Particle. Continuum and Rigid body. Newton's lawsBForce and its characteristics. types of forces-Gravity. Lateral and its distribution on surfaces.     Continuum and Rigid body. Newton's lawsBForce and its characteristics.       4     Classification of force systems. Principle of physical independence. Superposition, transmissibility of forces, Introduction to SI units     Couple. Moment of a couple. Characteristics of couple. Moment of a force, couple system       6     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Context of a couple. Couple system.       7     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Context of a couple.       8     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Context of a couple.       1     Basic fields of civil engineering     Context of a couple.     Context of a couple.       1     Basic fields of civil engineering     Context of a country     Context of a country       2     Differentiate between flexible and rigid pavement     Context of a country     Context of a country       2     Differentiate between flexible and rigid pavement     Context of a country     Context of a country       2     Differentiate between flexible and rigid pavement     Context of a country     Context of a country       2<	L2
4     Classification of force systems, Principle of physical independence, Superposition, transmissibility of forces., Introduction to SI units     Co1       5     Couple, Moment of a couple, Characteristics of couple, Moment of a force, Co1     Equivalent force - Couple system       6     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       7     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       8     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       8     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       6     Application Areas     CO     L       1     Basic fields of civil engineering     CO1     Co2       2     Resolve the forces acting on body     CO2     CO2       4     Review Questions     -     -       1     Discuss briefly the role of Civil Engineers in the infrastructure CO1     CO1       2     Differentiate between flexible and rigid pavement     CO2       2     Differentiate between flexible and rigid pavement     CO2       3     Bring out briefly scope of following specialization of civil engineering     CO2       4     Ex	L2
5     Couple, Moment of a couple, System     Co1       6     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       7     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       8     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       6     Application Areas     CO     L       1     Basic fields of civil engineering     CO1     CO2       2     Resolve the forces acting on body     CO2       4     Review Questions     -       1     Discuss briefly the role of Civil Engineers in the infrastructure development of a country     CO1       2     Differentiate between flexible and rigid pavement     CO2       3     Bring out briefly scope of following specialization of civil engineering     CO2       4     Explain briefly the classification of roces system     CO2       5     Define force. Explain the classification of forces     CO2       6     Explain briefly the classification of forces     CO2       7     Define force. Explain the classification of forces     CO2       6     Explain briefly in characteristics of couple     CO2	L2
6     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       7     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       8     Numerical problems on moment of forces and couples, on equivalent force - couple system.     Co1       6     Application Areas     CO     L       7     Resolve the forces acting on body     CO2       8     Review Questions     -       1     Discuss briefly the role of Civil Engineers in the infrastructure for development of a country     CO1       2     Differentiate between flexible and rigid pavement     CO2       3     Bring out briefly scope of following specialization of civil engineering i) Environmental Engineering ii) Geotechnical Engineering     CO2       4     Explain briefly the classification of roces.     CO2       5     Define force. Explain the classification of force system     CO2       6     Explain briefly the classification of civil engineering     CO2       7     Define couple. Explain characteristics of couple     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the fig-1. Find the     CO2	L3
force - couple system.     C01       8     Numerical problems on moment of forces and couples, on equivalent force - couple system.     C01       c     Application Areas     C0     L       1     Basic fields of civil engineering     C01       2     Resolve the forces acting on body     C02       d     Review Questions     -       1     Discuss briefly the role of Civil Engineers in the infrastructure development of a country     C01       2     Differentiate between flexible and rigid pavement     C01       3     Bring out briefly scope of following specialization of civil engineering     C02       4     Explain briefly the classification of rods.     C02       5     Define force. Explain the classification of force system     C02       6     Explain i)Principle of transmissibility of forces.     C02       10     Define couple. Explain the classification of civil engineering     C02       6     Explain i)Principle of following specialization of civil engineering     C02       7     Define couple. Explain characteristics of couple     C02       8     Bring out briefly scope of following specialization of civil engineering     C02       9     A force of 630N is acting on a block as shown	L3
force - couple system.     -       c     Application Areas     CO       1     Basic fields of civil engineering     CO1       2     Resolve the forces acting on body     CO2       d     Review Questions     -       1     Discuss briefly the role of Civil Engineers in the infrastructure development of a country     -       2     Differentiate between flexible and rigid pavement     CO1       3     Bring out briefly scope of following specialization of civil engineering     CO2       4     Explain briefly the classification of roads.     CO2       5     Define force. Explain the classification of force system     CO2       6     Explain ibriefly scope of following specialization of civil engineering     CO2       7     Define couple. Explain the classification of forces.     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the fig-1. Find the     CO2       10     Replace 1000N force at point A, which is acting at point B as shown in the fig-3.     CO1       11     A square A B C D as forces acting at along its sides as shown in the fig-3.     CO1       11     A square A B C D as forces actin	L3
1     Basic fields of civil engineering     CO1       2     Resolve the forces acting on body     CO2       d     Review Questions     -       1     Discuss briefly the role of Civil Engineers in the infrastructure development of a country     CO1       2     Differentiate between flexible and rigid pavement     CO1       3     Bring out briefly scope of following specialization of civil engineering i) Environmental Engineering ii) Geotechnical Engineering     CO2       4     Explain briefly the classification of roces.     CO2       5     Define force. Explain the classification of forces system     CO2       6     Explain i)Principle of transmissibility of forces.     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the fig-1. Find the     CO2       10     Replace 1000N force at point A. which is acting at point B as shown in the fig-3.     CO1       11     A square A B C D as forces acting at along its sides as shown in the fig-3.     CO1       11	L3
2     Resolve the forces acting on body     CO2       d     Review Questions     -       1     Discuss briefly the role of Civil Engineers in the infrastructure development of a country     CO1       2     Differentiate between flexible and rigid pavement     CO1       3     Bring out briefly scope of following specialization of civil engineering (CO2)     CO2       4     Explain briefly the classification of roads.     CO2       5     Define force. Explain the classification of forces system     CO2       6     Explain i)Principle of transmissibility of forces.     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       7     Define couple. Explain characteristics of couple     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the <b>fig-1</b> . Find the     CO2       10     Replace 1000N force at point A, which is acting at point B as shown in the <b>fig-3</b> .     CO1       11     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> .     CO1       11     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> .     CO1       11     A square A B C	Level
d     Review Questions     -       1     Discuss briefly the role of Civil Engineers in the infrastructure CO1 development of a country     CO1       2     Differentiate between flexible and rigid pavement     CO1       3     Bring out briefly scope of following specialization of civil engineering Development at Engineering ii) Geotechnical Engineering     CO2       4     Explain briefly the classification of roads.     CO2       5     Define force. Explain the classification of forces system     CO2       6     Explain i)Principle of transmissibility of forces.     CO2       7     Define couple. Explain characteristics of couple     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the fig-1. Find the     CO2       10     Replace 1000N force at point A, which is acting at point B as shown in the fig-3.     CO1       11     A square A B C D as forces acting at along its sides as shown in the fig-3.     CO1       11     A square A B C D as forces acting at along its sides as shown in the fig-3.     CO1       11     A square A B C D as forces acting at along its sides as shown in the fig-3.     CO1       11     A square A B C D as forces acting at along its sides as shown in the	L3
1     Discuss briefly the role of Civil Engineers in the infrastructure CO1 development of a country     CO1       2     Differentiate between flexible and rigid pavement     CO1       3     Bring out briefly scope of following specialization of civil engineering i) Environmental Engineering ii) Geotechnical Engineering     CO2       4     Explain briefly the classification of roads.     CO2       5     Define force. Explain the classification of force system     CO2       6     Explain i)Principle of transmissibility of forces.     CO2       7     Define couple. Explain characteristics of couple     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the <b>fig-1</b> . Find the     CO2       10     Replace 1000N force at point A, which is acting at point B as shown in the <b>fig-2</b> . Also find the moment at A.     CO1       11     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> . CO1     CO1       9     Find the value of P & Q, if the system reduces the couple. Also find the magnitude of the couple.     CO2       11     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> . CO1     CO1       12     CO1     CO1     CO1	L4
1     Discuss briefly the role of Civil Engineers in the infrastructure development of a country     CO1       2     Differentiate between flexible and rigid pavement     CO1       3     Bring out briefly scope of following specialization of civil engineering i) Environmental Engineering ii) Geotechnical Engineering     CO2       4     Explain briefly the classification of roads.     CO2       5     Define force. Explain the classification of force system     CO2       6     Explain i)Principle of transmissibility of forces.     CO2       7     Define couple. Explain characteristics of couple     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       7     Define couple. Explain characteristics of couple     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the <b>fig-1</b> . Find the     CO2       10     Replace 1000N force at point A, which is acting at point B as shown in the <b>fig-3</b> .     CO1       11     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> .     CO1       11     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> .     CO1       11     A square A B C D as forces acting	-
2     Differentiate between flexible and rigid pavement     CO1       3     Bring out briefly scope of following specialization of civil engineering     CO2       i) Environmental Engineering ii) Geotechnical Engineering     CO2       4     Explain briefly the classification of roads.     CO2       5     Define force. Explain the classification of force system     CO2       6     Explain i)Principle of transmissibility of forces.     CO2       7     Define couple. Explain characteristics of couple     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the <b>fig-1</b> . Find the     CO2       10     Replace 1000N force at point A, which is acting at point B as shown in the <b>fig-2</b> . Also find the moment at A.     CO1       11     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> .     CO1       11     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> .     CO1       11     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> .     CO1       11     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> .	L1
3     Bring out briefly scope of following specialization of civil engineering     CO2       4     Explain briefly the classification of roads.     CO2       5     Define force. Explain the classification of force system     CO2       6     Explain i)Principle of transmissibility of forces.     CO2       7     Define couple. Explain characteristics of couple     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the <b>fig-1</b> . Find the     CO2       10     Replace 1000N force at point A, which is acting at point B as shown in the     CO1       fig-2. Also find the moment at A.     In     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> .     CO1       9     Find the value of P & Q, if the system reduces the couple. Also find the magnitude of the couple.     CO1       11     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> .     CO1       12     CO1     CO1     CO1	L3
4Explain briefly the classification of roads.CO25Define force. Explain the classification of force systemCO26Explain i)Principle of transmissibility of forces. ii)Principle of physical independence of forcesCO27Define couple. Explain characteristics of coupleCO28Bring out briefly scope of following specialization of civil engineering i) Structural Engineering i) Transportation Engineering ii)Inclined to the plane and right angles to the planeCO29A force of 630N is acting on a block as shown in the <b>fig-1</b> . Find the i)Horizontal & vertical components ii)Inclined to the plane and right angles to the planeCO110Replace 1000N force at point A, which is acting at point B as shown in the <b>fig-2</b> . Also find the moment at A.CO111A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> . Find the value of P & Q, if the system reduces the couple. Also find the magnitude of the couple.CO1e <b>Experiences</b> -1CO12	L2
5     Define force. Explain the classification of force system     CO2       6     Explain i)Principle of transmissibility of forces.     CO2       ii)Principle of physical independence of forces     CO2       7     Define couple. Explain characteristics of couple     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the fig-1. Find the     CO2       10     Replace 1000N force at point A, which is acting at point B as shown in the fig-2. Also find the moment at A.     CO1       11     A square A B C D as forces acting at along its sides as shown in the fig-3. Find the walue of P & Q, if the system reduces the couple. Also find the magnitude of the couple.     CO1       e     Experiences     -       1     CO1     CO1       2     CO1     CO1	L4
6     Explain i)Principle of transmissibility of forces.     CO2       ii)Principle of physical independence of forces     CO2       7     Define couple. Explain characteristics of couple     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the <b>fig-1</b> . Find the     CO2       i)Horizontal & vertical components     ii)Inclined to the plane and right angles to the plane     CO1       10     Replace 1000N force at point A, which is acting at point B as shown in the <b>fig-3</b> .     CO1       fig-2. Also find the moment at A.     CO1     CO1       11     A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> .     CO1       e     Experiences     -       1     CO1     CO1       2     CO1     CO1	L2
7     Define couple. Explain characteristics of couple     CO2       8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the fig-1. Find the     CO2       10     Replace 1000N force at point A, which is acting at point B as shown in the fig-2. Also find the moment at A.     CO1       11     A square A B C D as forces acting at along its sides as shown in the fig-3. Find the value of P & Q, if the system reduces the couple. Also find the magnitude of the couple.     CO1       1     Experiences     -       1     CO1     CO1       2     CO1     CO1	L5
8     Bring out briefly scope of following specialization of civil engineering     CO2       9     A force of 630N is acting on a block as shown in the fig-1. Find the     CO2       i)Horizontal & vertical components     ii)Inclined to the plane and right angles to the plane     CO1       10     Replace 1000N force at point A, which is acting at point B as shown in the fig-2. Also find the moment at A.     CO1       11     A square A B C D as forces acting at along its sides as shown in the fig-3. Find the value of P & Q, if the system reduces the couple. Also find the magnitude of the couple.     CO1       e     Experiences     -       1     CO1     CO1       2     CO1     CO1	L2
9     A force of 630N is acting on a block as shown in the fig-1. Find the     CO2       i)Horizontal & vertical components     ii)Inclined to the plane and right angles to the plane     CO1       10     Replace 1000N force at point A, which is acting at point B as shown in the fig-2. Also find the moment at A.     CO1       11     A square A B C D as forces acting at along its sides as shown in the fig-3. Find the value of P & Q, if the system reduces the couple. Also find the magnitude of the couple.     CO1       e     Experiences     -       1     CO1     CO1       2     CO1     CO1	L3
10     Replace 1000N force at point A, which is acting at point B as shown in the fig-2. Also find the moment at A.     CO1       11     A square A B C D as forces acting at along its sides as shown in the fig-3. Find the value of P & Q, if the system reduces the couple. Also find the magnitude of the couple.     CO1       e     Experiences     -       1     CO1     CO1       2     Image: CO1     Image: CO1	L4
11     A square A B C D as forces acting at along its sides as shown in the fig-3.     CO1       Find the value of P & Q, if the system reduces the couple. Also find the magnitude of the couple.     CO1       e     Experiences     -       1     CO1     CO1       2     CO1     CO1	L1
1 CO1 2 CO1	L4
2	-
	L2
3	
4 CO3	

## Module – 2

Title:	Analysis of Concurrent Force Systems	Appr Time:	10 Hrs
а	Course Outcomes	-	Blooms
_	The student should be able to:	_	Level
1	Calculate the resultant of force system subjected to various load	CO3	L3
2	Apply laws of friction and types of friction	CO4	L3
b	Course Schedule	-	-
Class N	o Module Content Covered	CO	Level
9	Resultants and Equilibrium Composition of forces – Definition of Resultant; Composition of coplanar -concurrent force system,	CO3	L3
10	Parallelogram Law of forces, Principle of resolved parts; Numerical problems on composition of coplanar concurrent force systems.	CO3	L3
11	Equilibrium of forces – Definition of Equilibrant; Conditions of static equilibrium for different force systems, Lami's theorem	CO3	L3
12	Numerical problems on equilibrium of coplanar – concurrent and non- concurrent force systems	CO4	L3
13	Application- Static Friction in rigid bodies in contact Types of friction, Laws of static friction,	CO4	L3
14	Limiting friction, Angle of friction, angle of repose; Impending motion on horizontal and inclined planes	CO4	L3
15	Numerical Problems on single and two blocks on inclined planes	CO4	L3
16	Numerical Problems on single and two blocks on inclined planes	CO4	L3
с	Application Areas	со	Level
1	Concurrent forces	CO3	L3
2	Equilibrium and friction	CO4	L4
d	Review Questions	_	_
12	State and prove Parallelogram law of forces	CO3	L3
13	Explain different types of friction	CO4	 L3
14	State and prove Lami'stheorem	CO3	 L3
15	Define i) Angle of friction ii) Angle of Repose	CO4	 L3
16	Define i) Equilibrant ii) Resultant force	CO4	L3
17	Define friction & Explain laws of static friction	CO3	L3
18	Explain with sketch Cone friction	CO3	L3
19	Determine the reaction at contact points for spheres A & B as shown in fig Q 2(a).It is given that WA = 1200N, WB = 1500N, dA = 400mm, dB = 900mm	CO3	L3
е	Experiences	_	
1		CO1	L2
2		001	
3			
4		CO3	L3
5			

## E1. CIA EXAM – 1

## a. Model Question Paper - 1

Crs Code:	CS501PC	Sem:		Marks:	30	Time:	75 minutes
Course:							

-	-	Note: Answer any 2 questions, each carry equal marks.	Marks	CO
1	а	Define couple. Explain characteristics of couple	5	CO1
	b	Bring out briefly scope of following specialization of civil engineering i) Structural Engineering i) Transportation Engineering	5	CO1
	С	A force of 630N is acting on a block as shown in the <b>fig-1</b> . Find the i)Horizontal & vertical components	5	CO2
		ii)Inclined to the plane and right angles to the plane		
		Define former Evaluin the eleccification of former syntam		
2	a	Define force. Explain the classification of force system	5	CO1
	b	Explain i)Principle of transmissibility of forces. ii)Principle of physical independence of forces	5	CO1
	С	Replace 1000N force at point A, which is acting at point B as shown in the <b>fig-2</b> . Also find the moment at A	5	CO1
3	а	State and prove Parallelogram law of forces	5	CO2
	b	Define i) Angle of friction ii) Angle of Repose	5	CO2
	С	A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> . Find the value of P & Q, if the system reduces the couple. Also find the		CO1

1 3	~	clate and prover diateogram taw of ferees	J	002	-5
	b	Define i) Angle of friction ii) Angle of Repose	5	CO2	L3
		A square A B C D as forces acting at along its sides as shown in the <b>fig-3</b> . Find the value of P & Q, if the system reduces the couple. Also find the		CO1	L3
		magnitude of the couple.			
4	а	Explain with sketch Cone friction	5	CO2	L3
	b	State and prove Lami'stheorem	5	CO2	L3
		Determine the reaction at contact points for spheres A & B as shown in fig	5	CO2	L3
		Q 2(a).It is given that WA = 1200N, WB = 1500N, dA = 400mm, dB = 900mm			

### b. Assignment -1

Note: A distinct assignment to be assigned to each student.

			-	Mo	odel Assignmer		5			
Crs C	ode:	CS501P0		1	Marks:	5 / 10	Time:	90 - 120	minute	S
Cours					and mechanics					
-			to answer 2-3		ments. Each as		arries equal m			
SNo		USN			ssignment Des			Marks	СО	Level
1			Discuss briet developmen		ole of Civil Eng puntry	gineers in th	ne infrastructu	re 5	CO1	L3
2			Differentiate	betwee	n flexible and r	igid paveme	ent	5	CO1	L3
3			engineering		cope of follov jineering ii) Geo	<b>.</b>		vil	CO1	L3
4			Explain brief	y the cl	assification of r	oads.		5	CO1	L3
5					the classificati		system	5	CO2	L3
6			ii)Principle o	f physic	transmissibility al independen	ce of forces		5	CO2	L3
7			Define coupl	e. Expla	in characteristi	cs of couple	e		CO2	L3
8			engineering	-	cope of follov ring i) Transpor			vil 5	CO2	L3
9			the i)Horizontal 8	k vertica	cting on a block Il components ne and right ang			nd 5	CO2	L3
10			Replace 100	oN forc	e at point A, w Iso find the mo	hich is actir		as 5	CO2	L3
11			in the fig-3. I	-ind the	forces acting value of P & C magnitude of	Q, if the syst			CO2	L3
12			State and pro	ove Para	allelogram law	of forces		5	CO2	L3
13			Explain differ	ent type	es of friction			5	CO1	L3
14			State and pro	ove Larr	ni'stheorem			5	CO1	L3
15			Define i) Ang	le of fric	ction ii) Angle c	f Repose			CO1	L3
16			Define i) Equ	ilibrant i	i) Resultant for	ce		5	CO1	L3
BC										

Level L2 L2

L3

L3

L3

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L3

	Define a finiation of the state	_	001	10
17	Define friction & Explain laws of static friction	5	CO1	
18	Explain with sketch Cone friction	5	CO1	
19	Determine the reaction at contact points for spheres A & B as		CO1	L3
	shown in fig Q 2(a).It is given that WA = 1200N, WB = 1500N, dA			
	= 400mm, dB = 900mm			
20	State and prove Parallelogram law of forces	5	CO2	
21	Explain different types of friction	5	CO2	L3
22	State and prove Lami'stheorem	5	CO2	L3
23	Define i) Angle of friction ii) Angle of Repose		CO2	L3
24	Define i) Equilibrant ii) Resultant force	5	CO1	L3
25	Define friction & Explain laws of static friction	5	CO1	L3
26	Explain with sketch Cone friction	5	CO1	L3
27	Determine the reaction at contact points for spheres A & B as	5	CO1	L3
	shown in fig Q 2(a).It is given that WA = 1200N, WB = 1500N, dA			
	= 400mm, dB = 900mm			
28	Discuss briefly the role of Civil Engineers in the infrastructure	5	CO1	L3
	development of a country			
29	Differentiate between flexible and rigid pavement		CO1	L3
30	Bring out briefly scope of following specialization of civil	5	CO1	L3
	engineering			
	i) Environmental Engineering ii) Geotechnical Engineering			
31	Explain briefly the classification of roads.	5	CO2	L3
32	Define force. Explain the classification of force system	5	CO2	L3
33	Explain i)Principle of transmissibility of forces.		CO2	L3
	ii)Principle of physical independence of forces			
34	Define couple. Explain characteristics of couple	5	CO2	L3
35	Bring out briefly scope of following specialization of civil	5	CO2	L3
	engineering			
	i) Structural Engineering i) Transportation Engineering			
36	A force of 630N is acting on a block as shown in the <b>fig-1</b> . Find	5	CO2	L3
	the			
	i)Horizontal & vertical components			
	ii)Inclined to the plane and right angles to the plane			
37	Replace 1000N force at point A, which is acting at point B as	5	CO2	L3
	shown in the <b>fig-2.</b> Also find the moment at A.			
38	A square A B C D as forces acting at along its sides as shown		CO2	L3
	in the <b>fig-3</b> . Find the value of P & Q, if the system reduces the			
	couple. Also find the magnitude of the couple.			
39	State and prove Parallelogram law of forces	5	CO2	L3
40	Explain different types of friction	5	CO2	L3
41	State and prove Lami'stheorem	5	CO2	L3
42	Define i) Angle of friction ii) Angle of Repose	5	CO2	L3
43	Define i) Equilibrant ii) Resultant force	5	CO2	L3
44	Define friction & Explain laws of static friction	5	CO2	L3
45	Explain with sketch Cone friction	5	CO2	L3
46	Determine the reaction at contact points for spheres A & B as	5	CO2	L3
-	shown in fig Q 2(a).It is given that WA = 1200N, WB = 1500N, dA	-		2
	= 400mm, dB = 900mm			
47	Bring out briefly scope of following specialization of civil	5	CO1	L3
	engineering	J		5
.,			1	
.,	i) Structural Engineering i) Transportation Engineering			
	i) Structural Engineering i) Transportation Engineering			

# D2. TEACHING PLAN - 2

# Module – 3

a	Course Outcomes	-	Blooms
Title:	Analysis of Non-Concurrent Force Systems	Appr Time:	16 Hrs
		r.	

	The student should be able to:		Level
1	compute the reactive force that develop as result of external load	CO5	L3
2	calculate the trusses by method of joints and section	CO6	L3
b	Course Schedule		
lass N	o Module Content Covered	СО	Level
17	Support Reaction in beams Types of Loads and Supports, statically determinate beams	CO5	L3
18	Numerical problems on support reactions for statically determinate beams with Point load (Normal and inclined) and	CO5	L3
19	Numerical problems on uniformly distributed and uniformly varying loads and Moments.	CO5	L3
20	Numerical problems on uniformly distributed and uniformly varying loads and Moments.	CO5	L3
21	Types of trusses,	CO6	L3
22	analysis of statically determinate trusses using method of joints and method of section	CO6	L3
23	analysis of statically determinate trusses using method of joints and method of section	CO6	L3
24	analysis of statically determinate trusses using method of joints and method of section	CO6	L3
с	Application Areas	СО	Level
1	Support reaction	CO5	L3
2	Analyzing the forces acting on trusses	CO6	L3
d	Review Questions	-	_
1	Explain different types of statically determinate beams	CO5	L3
2	Explain different types of statically indeterminate beams	CO5	L3
3	What is mean by support reaction		
		CO5	L3
4	Explain different types of supports and loads in the analysis of beam	CO5 CO5	L3 L3
4 5	Explain different types of supports and loads in the analysis of beamDetermine the reaction at the supports for the system as shown in fig		
	Explain different types of supports and loads in the analysis of beamDetermine the reaction at the supports for the system as shown in figFind the support reaction for beam loaded as shown in fig	CO5 CO5 CO5	L3
5	Explain different types of supports and loads in the analysis of beamDetermine the reaction at the supports for the system as shown in fig	CO5 CO5	L3 L3
5 6	Explain different types of supports and loads in the analysis of beamDetermine the reaction at the supports for the system as shown in figFind the support reaction for beam loaded as shown in figDefine trussesWhat are the assumption are made in analyzing the simple truss	CO5 CO5 CO5 CO6 CO6	L3 L3 L3
5 6 7	Explain different types of supports and loads in the analysis of beam Determine the reaction at the supports for the system as shown in fig Find the support reaction for beam loaded as shown in fig Define trusses	CO5 CO5 CO5 CO6	L3 L3 L3 L3 L3 L3
5 6 7 8	Explain different types of supports and loads in the analysis of beamDetermine the reaction at the supports for the system as shown in figFind the support reaction for beam loaded as shown in figDefine trussesWhat are the assumption are made in analyzing the simple truss	CO5 CO5 CO5 CO6 CO6	L3 L3 L3 L3 L3
5 6 7 8 9	Explain different types of supports and loads in the analysis of beamDetermine the reaction at the supports for the system as shown in figFind the support reaction for beam loaded as shown in figDefine trussesWhat are the assumption are made in analyzing the simple trussExplain classification of trusses	CO5 CO5 CO6 CO6 CO6	L3 L3 L3 L3 L3 L3 L3 L3
5 6 7 8 9 10	Explain different types of supports and loads in the analysis of beamDetermine the reaction at the supports for the system as shown in figFind the support reaction for beam loaded as shown in figDefine trussesWhat are the assumption are made in analyzing the simple trussExplain classification of trussesDifferentiate between method of joint and method of sectionAnalysis of statically determinate trusses using method of joints shown in	CO5 CO5 CO6 CO6 CO6 CO6	L3 L3 L3 L3 L3 L3 L3 L3
5 6 7 8 9 10 11	Explain different types of supports and loads in the analysis of beam Determine the reaction at the supports for the system as shown in fig Find the support reaction for beam loaded as shown in fig Define trusses What are the assumption are made in analyzing the simple truss Explain classification of trusses Differentiate between method of joint and method of section Analysis of statically determinate trusses using method of joints shown in fig	CO5 CO5 CO6 CO6 CO6 CO6 CO6	L3 L3 L3 L3 L3 L3 L3 L3 L3
5 6 7 8 9 10 11 11	Explain different types of supports and loads in the analysis of beam Determine the reaction at the supports for the system as shown in fig Find the support reaction for beam loaded as shown in fig Define trusses What are the assumption are made in analyzing the simple truss Explain classification of trusses Differentiate between method of joint and method of section Analysis of statically determinate trusses using method of joints shown in fig	CO5 CO5 CO6 CO6 CO6 CO6 CO6	L3 L3 L3 L3 L3 L3 L3 L3 L3
5 6 7 8 9 10 11 11 <b>e</b> 1	Explain different types of supports and loads in the analysis of beam Determine the reaction at the supports for the system as shown in fig Find the support reaction for beam loaded as shown in fig Define trusses What are the assumption are made in analyzing the simple truss Explain classification of trusses Differentiate between method of joint and method of section Analysis of statically determinate trusses using method of joints shown in fig	CO5 CO5 CO6 CO6 CO6 CO6 CO6	L3 L3 L3 L3 L3 L3 L3 L3 L3
5 6 7 8 9 10 11 11 <b>e</b> 1 2	Explain different types of supports and loads in the analysis of beam Determine the reaction at the supports for the system as shown in fig Find the support reaction for beam loaded as shown in fig Define trusses What are the assumption are made in analyzing the simple truss Explain classification of trusses Differentiate between method of joint and method of section Analysis of statically determinate trusses using method of joints shown in fig	CO5 CO5 CO6 CO6 CO6 CO6 CO6	L3 L3 L3 L3 L3 L3 L3 L3 L3

# Module - 4

Title:	Centroids and Moments of Inertia of Engineering Sections:	Appr	16 Hrs
		Time:	
a	Course Outcomes	-	Blooms
-	The student should be able to:	-	Level
1	determine centroid of built up section	CO7	L3
2	Calculate M.I of full/quadrant circular section	CO8	L3
b	Course Schedule		
Class No	Module Content Covered	СО	Level
25	Introduction to the concept, centroid of line and area, centroid of basic	CO7	L3

	17. CAAS. All rights reserved. geometrical figures		
26	computing centroid for– T, L, I, Z and full/quadrant circular sections and	CO7	L3
20	their built up sections.	007	
27	computing centroid for– T, L, I, Z and full/quadrant circular sections and	CO7	L3
	their built up sections.		
28	Numerical problems on centroid for– T, L, I, Z and full/quadrant circular	CO7	L3
	sections and their built up sections.		
29	ntroduction to the concept, Radius of gyration, Parallel axis theorem,	CO8	L3
	Perpendicular axis theorem,		
30	Moment of Inertia of basic planar figures, computing moment of Inertia for	CO8	L3
	– T, L, I, Z and full/quadrant circular sections and their built up sections		
31	Moment of Inertia of basic planar figures, computing moment of Inertia for	CO8	L3
	– T, L, I, Z and full/quadrant circular sections and their built up sections		
32	Moment of Inertia of basic planar figures, computing moment of Inertia for	CO8	L3
	– T, L, I, Z and full/quadrant circular sections and their built up sections		
	Application Areas	со	Leve
<b>C</b>	Application Areas	C07	
1	Calculating the area and center of gravity of geometric figures Computing the radius of gyration of geometric figures	C07 C08	L3
2	Computing the radius of gyration of geometric ligures	008	L3
d	Review Questions	-	_
1	Define centroid	CO7	L3
2	Determine the centroid of quarter circle	CO7	L3
3	Determine the centroid of triangle by method of integration	CO7	L3
4	Determine the centroid of lamina as shown in fig	CO7	L3
5	Determine the centroid of semi circle by method of integration	CO7	L3
6	Define 2 <sup>nd</sup> moment of force	CO8	L3
7	What is mean by radius of gyration and explain	CO8	L3
8	State and prove parallel axis theorem	CO8	L3
9	State and prove perdendicular axis theorem	CO8	L3
10	Determine the MI of semi circle by method of integration	CO8	L3
11	Determine the MI of lamina as shown in fig	CO8	L3
12	Determine the centroid of shaded part as shown in fig	CO7	L3
е	Experiences	-	-
1		CO7	L2
2			
3			
4		CO8	L3
5			

# E2. CIA EXAM – 2

# a. Model Question Paper - 2

Crs (	Code:	CS501PC	Sem:	1	Marks:	30	Time:	75 m	ninute	S	
Cou	ourse:										
-	-	Note: Answ	/er any 2 qu	estions, ead	ch carry eq	ual mark	S.	Ν	/larks	СО	Level
1	а	Explain diffe	erent types	of supports	and loads i	n the ana	alysis of beam		7	CO6	L3
	b	Determine	the reaction	at the supp	orts for the	e system	as shown in fig		8	CO5	L3
2				nethod of jo					7	CO5	L3
		Analysis of fig	statically de	eterminate t	russes usin	ig metho	d of joints show	vn in	8	CO6	L3
3	a	Determine	the centroic	l of quarter o	circle				7	CO7	L3
	b			l of lamina a		fig			8	C07	L3
4	a	Determine	the centroic	l of semi circ	le by meth	nod of inte	egration		7	CO7	L3
	b			l of shaded p			<u> </u>		8	CO7	L3

Note: A distinct assignment to be assigned to each student.

Note:	A dist	inct assi	gnment to be assigned to each student.			
			Model Assignment Questions			
Crs Co		CS501P0		0 – 120 I	minute	S
Cours			and Analysis of Algorithms			
			to answer 2-3 assignments. Each assignment carries equal mar	k.		
SNo	l	JSN	Assignment Description	Marks	СО	Level
1			Explain different types of statically determinate beams	5	CO8	L3
2			Explain different types of statically indeterminate beams	5	CO8	L3
3			What is mean by support reaction		CO8	L3
4			Explain different types of supports and loads in the analysis of	f 5	CO8	L3
			beam			
5			Determine the reaction at the supports for the system as	5 5	CO8	L3
			shown in fig			
6			Find the support reaction for beam loaded as shown in fig	5	CO8	L3
7			Define trusses	5	C08	 
8			What are the assumption are made in analyzing the simple	\$ 5	COg	L3
			truss		009	
9			Explain classification of trusses	5	COg	L3
10			Differentiate between method of joint and method of section	5	CO9	L3
10			Analysis of statically determinate trusses using method of		COg	L3
			joints shown in fig		COY	L3
12			Define centroid	5	COg	L3
			Determine the centroid of quarter circle		CO9	L3
13			Determine the centroid of triangle by method of integration	5	-	-
14				5	COg	L3
15			Determine the centroid of lamina as shown in fig		CO9	L3
16			Determine the centroid of semi circle by method of integration		CO9	L3
17			Define 2 <sup>nd</sup> moment of force	5	CO8	L3
18			What is mean by radius of gyration and explain	5	CO8	L3
19			State and prove parallel axis theorem		CO8	L3
20			State and prove perdendicular axis theorem	5	CO8	L3
21			Determine the MI of semi circle by method of integration	5	CO8	L3
22			Determine the MI of lamina as shown in fig	5	CO8	L3
23			Determine the centroid of shaded part as shown in fig	5	CO8	L3
24			Define centroid	5	CO8	L3
25			Determine the centroid of quarter circle		CO8	L3
26			Determine the centroid of triangle by method of integration	5	COg	L3
27			Determine the centroid of lamina as shown in fig	5	CO9	L3
28			Determine the centroid of semi circle by method of integration	5	CO8	L3
29			Define 2 <sup>nd</sup> moment of force		CO8	L3
30			What is mean by radius of gyration and explain	5	CO8	L3
31			State and prove parallel axis theorem	5	CO8	L3
32			State and prove perdendicular axis theorem	5	CO8	L3
33			Determine the MI of semi circle by method of integration	5	CO8	L3
34			Determine the MI of lamina as shown in fig		CO8	L3
35			Determine the centroid of shaded part as shown in fig	5	CO8	L3
36			Explain different types of supports and loads in the analysis of	5	CO8	L3
			beam			
37			Determine the reaction at the supports for the system as	5	CO8	L3
			shown in fig			
38			Find the support reaction for beam loaded as shown in fig		CO9	L3
39			Define trusses	5	CO9	L3
40			What are the assumption are made in analyzing the simple	5	CO9	L3
			truss			
41			Explain classification of trusses	5	CO9	L3
42			Differentiate between method of joint and method of section		CO9	L3
43			Analysis of statically determinate trusses using method of	f 5	CO9	L3
			joints shown in fig			
			Explain different types of statically determinate beams	5	CO9	L3

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45	Explain different types of statically indeterminate beams	5	CO9	L3
46	What is mean by support reaction	5	CO9	L3
47	Explain different types of supports and loads in the analysis of	5	CO9	L3
	beam			

# D3. TEACHING PLAN - 3

# Module – 5

Title:	Kinematics and Kinetics	Appr Time:	16 Hrs
a	Course Outcomes	-	Bloom
-	The student should be able to:	-	Level
1	illustrate relationship between motion of bodies	CO9	L3
2	describe relationship between plane motion and connected bodies	CO10	L3
b	Course Schedule		
ass No	Module Content Covered	CO	Level
33	Concepts and Applications Definitions – Displacement – Average velocity	CO9	L3
34	Instantaneous velocity – Speed – Acceleration – Average acceleration	CO9	L3
35	Variable acceleration – Acceleration due to gravity – Newton's Laws of Motion.	CO9	L3
36	Variable acceleration – Acceleration due to gravity – Newton's Laws of Motion.	CO9	L3
37	D' Alembert's principle and its application in plane motion and connected bodies including pulleys	CO10	L3
38	application in plane motion and connected bodies including pulleys	CO10	L3
39	D' Alembert's principle and its application in plane motion and connected bodies including pulleys	CO10	L3
40	D' Alembert's principle and its application in plane motion and connected bodies including pulleys	CO10	L3
с	Application Areas	со	Level
1	Kinematics	COg	Level
2	Kinetics	CO10	L3
d	Review Questions		_
1	Define i) displacement ii) speed iii) uniform velocity iv) average velocity	CO10	L3
2	State and explain Newtons law of motion	CO10	 L3
3	Derive relationship between linear acceleration and angular acceleration	CO9	 L3
4	Derive relationship between r.p.m and angular velocity	CO9	 L3
5	A wheel is rotating about a fixed axis at 20 r.p.m is uniformly accelerated for 70 sec, during which time it makes 50 revolution. Determine I) angular velocity at the end of this interval and ii) time required for the speed to reach 110 rpm	CO9	 L3
6	A burglar's car starts with an acceleratin of 2 m/sec2. A police van came after 10 sec and continued to chase the burglar's car with an uniform velocity of 40 m/sec. Find the time taken by the police van to overtake the burglar's car.	CO9	L3
7	Define: i) Instantaneous velocity ii) Uniform acceleration iii) Variable acceleration iv) Retardation	CO9	L3
8	What is a projectile? Define: i) Angle of projection ii) Horizontal Range iii) Vertical Height iv) Time of fligh	CO9	L3
9	State and explain D' Alemberts principle	CO10	L3
10	What is Banking (super elevation) and why it is provided?	CO10	L3
11	Define:i) Centrifugal Force ii) Centripetal force iii) Centripetal Acceleration	CO10	L3
е	Experiences	-	-
1		CO10	L2
			1

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4		CO9	L3
5			

## E3. CIA EXAM – 3

#### a. Model Question Paper - 3

Crs	Code	CS501PC Se	em:	l	Marks:	30	Time:	75 ו	minute	S	
Cou	rse:	Design and Ar	nalysis of A	lgorithms			·				
-	-	Note: Answer	any 2 que	stions, eac	h carry eq	ual mark	S.		Marks	СО	Level
1	a	State and prov	/e parallel	axis theore	m				7	CO8	L3
	b	Determine the	e MI of sen	ni circle by	method of	integratio	on		8	CO8	L3
2	a	Determine the	e MI of lam	ina as shov	vn in fig				7	CO8	L3
	b	Determine the	e radius of	gyration fo	r the lamin	a as show	/n in fig		8	CO8	L3
3	a	Derive relatior	nship betw	een linear	acceleratio	on and and	gular accelerat	ion	7	COg	L3
		Derive relationship between linear acceleration and angular acceleration A burglar's car starts with an acceleratin of 2 m/sec2. A police van came after 10 sec and continued to chase the burglar's car with an uniform velocity of 40 m/sec. Find the time taken by the police van to overtake the burglar's car.						form	8	CO9	L3
4	a	State and expl	lain D' Aler	nberts prin	ciple				7	CO10	L3
	b	Define:i) Centr	ifugal Ford	ce ii) Centrip	betal force	iii) Centrip	petal Accelerat	ion	8	CO10	L3

#### b. Assignment – 3

Note: A distinct assignment to be assigned to each student.

			<u>g</u>		del Assignmer		;			
Crs Co	ode:	CS501P0	C Sem:	1	Marks:	5 / 10	Time:	90 - 120	minute	S
Cours	se:	Design a	and Analysis o	of Algori	ithms		·			
Note:	Each	student	to answer 2-3	assigni	ments. Each ass	signment ca	arries equal ma	ark.	_	
SNo		USN		Marks	со	Level				
1			Decelaration	vi) Aver			ľ	v) 5	CO9	L3
2					per elevation) a			5	CO9	L3
3				•	Define: i) Angle ight iv) Time of		on ii) Horizont	al 5	CO10	L3
4			Define:i) Cen Acceleration	trifugal	Force ii) Centi	ripetal force	e iii) Centripet	al 5	CO10	L3
5					ous velocity ii n iv) Retardatio		acceleration i	ii) 5	CO10	L3
6			Define i) disp velocity	laceme	nt ii) speed iii) u	uniform velo	ocity iv) averag	le 5	CO10	L3
7			State and exp	olain Ne	wtons law of m	notion		5	CO10	L3
8			Derive relation	onship	between linear	r accelerati	on and angula		CO10	L3
9					etween r.p.m a			5	CO10	L3
10			accelerated revolution. D	for 70 etermir	about a fixed a sec, during ne I) angular v equired for the	which time elocity at t	e it makes 5 the end of th	50	CO10	L3
11		interval and ii) time required for the speed to reach 110 rpm A burglar's car starts with an acceleratin of 2 m/sec2. A police van came after 10 sec and continued to chase the burglar's car with an uniform velocity of 40 m/sec. Find the time taken by the police van to overtake the burglar's car.							CO10	L3
12			Define: i) Ins Variable acce	ii) 5	CO10	L3				
13					Define: i) Angle ight iv) Time of		on ii) Horizont	al 5	CO10	L3
14			State and exp	olain D'	Alemberts prin	ciple		5	CO9	L3
15			What is Bank	ing (sup	per elevation) a	nd why it is	provided?	5	CO9	L3

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16	Define:i) Centrifugal Force ii) Centripetal force iii) Centripetal Acceleration	5	CO9	L3
17	Define i) displacement ii) speed iii) uniform velocity iv) average velocity	5	CO9	L3
18	State and explain Newtons law of motion	5	CO9	L3
19	Derive relationship between linear acceleration and angular acceleration	5	CO9	L3
20	Derive relationship between r.p.m and angular velocity	5	COg	L3
21	A wheel is rotating about a fixed axis at 20 r.p.m is uniformly accelerated for 70 sec, during which time it makes 50 revolution. Determine I) angular velocity at the end of this interval and ii) time required for the speed to reach 110 rpm	5	CO9	L3
22	A burglar's car starts with an acceleratin of 2 m/sec2. A police van came after 10 sec and continued to chase the burglar's car with an uniform velocity of 40 m/sec. Find the time taken by the police van to overtake the burglar's car.	5	CO9	L3
23	Define: i) Instantaneous velocity ii) Uniform acceleration iii) Variable acceleration iv) Retardation	5	CO10	L3
24	What is a projectile? Define: i) Angle of projection ii) Horizontal Range iii) Vertical Height iv) Time of fligh	5	CO10	L3
25	State and explain D' Alemberts principle	5	CO10	L3
26	What is Banking (super elevation) and why it is provided?	5	CO10	L3
27	Define:i) Centrifugal Force ii) Centripetal force iii) Centripetal Acceleration	5	CO10	L3
28	Define i) displacement ii) speed iii) uniform velocity iv) average velocity	5	CO10	L3
29	State and explain Newtons law of motion	5	CO10	L3
30	Derive relationship between linear acceleration and angular acceleration	5	CO10	L3
31	Derive relationship between r.p.m and angular velocity	5	CO10	L3
32	A wheel is rotating about a fixed axis at 20 r.p.m is uniformly accelerated for 70 sec, during which time it makes 50 revolution. Determine I) angular velocity at the end of this interval and ii) time required for the speed to reach 110 rpm	5	CO10	L3
33	A burglar's car starts with an acceleratin of 2 m/sec2. A police van came after 10 sec and continued to chase the burglar's car with an uniform velocity of 40 m/sec. Find the time taken by the police van to overtake the burglar's car.	5	CO9	L3
34	Define: i) Instantaneous velocity ii) Uniform acceleration iii) Variable acceleration iv) Retardation		CO9	L3
35	What is a projectile? Define: i) Angle of projection ii) Horizontal Range iii) Vertical Height iv) Time of fligh		CO9	L3
36	State and explain D' Alemberts principle		CO9	L3
37	What is Banking (super elevation) and why it is provided?		CO9	L3
38	Define:i) Centrifugal Force ii) Centripetal force iii) Centripetal Acceleration		CO9	L3
39	Define i) displacement ii) speed iii) uniform velocity iv) average velocity		CO9	L3
40	State and explain Newtons law of motion		CO9	L3
41	Derive relationship between linear acceleration and angular acceleration		CO9	L3
42	Derive relationship between r.p.m and angular velocity		CO10	L3
43	A wheel is rotating about a fixed axis at 20 r.p.m is uniformly accelerated for 70 sec, during which time it makes 50 revolution. Determine I) angular velocity at the end of this interval and ii) time required for the speed to reach 110 rpm		CO10	L3
44	A burglar's car starts with an acceleratin of 2 m/sec2. A police van came after 10 sec and continued to chase the burglar's car with an uniform velocity of 40 m/sec. Find the time taken by the police van to overtake the burglar's car.		CO10	L3
45	Define: i) Instantaneous velocity ii) Uniform acceleration iii)		CO10	L3

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	Variable acceleration iv) Retardation					
46	What is a projectile? Define: i) Angle of projection ii) Horizontal		CO10	L3		
	Range iii) Vertical Height iv) Time of fligh					
47	State and explain D' Alemberts principle	(	CO10	L3		
48	What is Banking (super elevation) and why it is provided?	(	CO10	L3		
49	Define:i) Centrifugal Force ii) Centripetal force iii) Centripetal		CO10	L3		
	Acceleration					

# F. EXAM PREPARATION

# 1. University Model Question Paper

		Dosign and Analysis of Algorithms	onth /	Voor	May	2010
	Code:		onth / me:		May /2	
					180 mi	
-		Answer all FIVE full questions. All questions carry equal marks.	<b>r</b>	Marks		Leve
1		Define couple. Explain characteristics of couple		6	CO1	L3
		Bring out briefly scope of following specialization of civil engineering		6	CO1	L3
		i) Structural Engineering i) Transportation Engineering A force of 630N is acting on a block as shown in the <b>fig-1</b> . Find the		8	CO2	10
		i)Horizontal & vertical components		0	002	L3
		ii)Inclined to the plane and right angles to the plane				
		OR				L3
-	а	Define force. Explain the classification of force system		6	CO1	L3
		Explain i)Principle of transmissibility of forces.		6	CO2	L3
		ii)Principle of physical independence of forces		0	002	L_2
	с	Replace 1000N force at point A, which is acting at point B as shown i	in the	8	CO2	L3
		fig-2. Also find the moment at A		0	002	L_2
2	а	Explain with sketch Cone friction		6	C03	L3
-		State and prove Lami'stheorem		6		L3
	-	Determine the reaction at contact points for spheres A & B as shown	in fia	8	CO4	L3
	Ŭ	Q 2(a).It is given that WA = 1200N, WB = 1500N, dA = 400mm, dB = 900		U	004	
		OR				
_	a	State and prove Parallelogram law of forces		6	CO3	L3
		Define i) Angle of friction ii) Angle of Repose		6	CO4	 L3
		A square A B C D as forces acting at along its sides as shown in the	fia-4.	8	004	L3
		Find the value of P & Q, if the system reduces the couple. Also find		Ũ		
		magnitude of the couple.				
3	a	Explain different types of supports and loads in the analysis of beam		7	CO5	L3
	b	Determine the reaction at the supports for the system as shown in <b>fi</b>	a 5	8	CO6	L3
		OR	50	-		
-	a	Differentiate between method of joint and method of section		7	CO5	L3
		Analysis of statically determinate trusses using method of joints sho	wn in	8	CO6	L3
		fig 6				
4	a	Determine the centroid of semi circle by method of integration		6	CO7	L3
	b	State and prove parallel axis theorem		6	CO8	L3
	С	Determine the radius of gyration for the lamina as shown in <b>fig 7</b>		8	C08	L3
		OR				
-	a	Determine the MI of semi circle by method of integration		6	CO7	L3
	b	Determine the centroid of I section		6	CO8	L3
	С	Determine the centroid of shaded part as shown in <b>fig 8</b>		8	CO7	L3
		· · · · · ·				
5	а	State and explain D' Alemberts principle		6	CO10	L3
		What is a projectile? Define: i) Angle of projection ii) Horizontal Ran	ge iii)	6	CO10	L3
		Vertical Height iv) Time of fligh				
	С	A burglar's car starts with an acceleratin of 2 m/sec2. A police van	came	8	CO9	L3
		after 10 sec and continued to chase the burglar's car with an un				
		velocity of 40 m/sec. Find the time taken by the police van to ove				
		the burglar's car.				

#### 2. SEE Important Questions

Cour		Design and Analysis of Algorithms Month			
Crs (	Code:	CS501PC Sem: 3 Marks: 100 Time:	1	180 mi	inutes
		Answer all FIVE full questions. All questions carry equal marks.	-	-	
Mo	Qno.	Important Question	Marks	со	Year
dul e					
1	1	Define couple. Explain characteristics of couple	6	CO1	2004
1	2	Bring out briefly scope of following specialization of civil engineering	6	CO1	2002
		i) Structural Engineering i) Transportation Engineering		001	2002
		A force of 630N is acting on a block as shown in the <b>fig-1</b> . Find the	8	CO2	2004
		i)Horizontal & vertical components			
		ii)Inclined to the plane and right angles to the plane			
	4	Define force. Explain the classification of force system	6	CO2	2007
	5	Explain i)Principle of transmissibility of forces.	6	CO2	2007
		ii)Principle of physical independence of forces			
			0	001	
2	1	Explain with sketch Cone friction	6	CO2	2005
	2	State and prove Lami'stheorem	6	CO2	2005
	3	State and prove Parallelogram law of forces	6 6	CO2	2009
	4	Define i) Angle of friction  ii) Angle of  Repose A square A B C D as forces acting at along its sides as shown in the <b>fig-4</b> .		CO2 CO2	2006
	5	Find the value of P & Q, if the system reduces the couple. Also find the		002	2004
		magnitude of the couple.			
3	1	Explain different types of supports and loads in the analysis of beam	6	CO2	2006
	2	Determine the reaction at the supports for the system as shown in <b>fig 5</b>	8	CO2	2006
	3	Differentiate between method of joint and method of section	6	CO2	2007
	4	Analysis of statically determinate trusses using method of joints shown in		CO2	2004
		fig 6			
4	1	Determine the centroid of semi circle by method of integration	6	CO2	2004
	2	State and prove parallel axis theorem	6	CO2	2004
	3	Determine the radius of gyration for the lamina as shown in <b>fig 7</b>	8	CO2	2006
	4	Determine the MI of semi circle by method of integration	6	CO7	2004
	5	Determine the centroid of I section	8	CO8	2007
5	1	State and explain D' Alemberts principle	6	CO10	2000
	2	What is a projectile? Define: i) Angle of projection ii) Horizontal Range iii)		CO10	2009
	<u> </u>	Vertical Height iv) Time of fligh		cog	2007
	3	What is Banking (super elevation) and why it is provided?	6	CO10	2007
		Define:i) Centrifugal Force ii) Centripetal force iii) Centripetal Acceleration	6	CO10	
	5	A burglar's car starts with an acceleratin of 2 m/sec2. A police van came		CO9	2005
		after 10 sec and continued to chase the burglar's car with an uniform			
		velocity of 40 m/sec. Find the time taken by the police van to overtake			
		the burglar's car.			