#### KANDULA SRINIVASA REDDY MEMORIAL COLLEGE OF ENGINEERING (AUTONOMOUS)

#### KADAPA-516003. AP

(Approved by AICTE, Affiliated to JNTUA, Ananthapuramu, Accredited by NAAC) (An ISO 9001-2008 Certified Institution)

#### DEPARTMENT OF MECHANICAL ENGINEERING



#### VALUE ADDED COURSE

ON

"Product Design & Drafting by CATIA"

Resource Person : Sri. U.Pradeep Kumar, Asst. Professor, Dept. of ME, KSRMCE Course Coordinator: Dr. S.Shakeel Ahmed, Associate Professor, Dept. of ME, **KSRMCE** 

**Duration:** 06/02/2023 to 23/02/2023







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#### PERMISSION LETTER

Lr./KSRMCE/Dept.of ME /2022-2023

Date:01/02/2023

To The Principal KSRM College of Engineering, Kadapa, AP.

#### //THROUGH PROPER CHANNEL//

Respected sir

Sub: KSRMCE-Dept of ME - Permission for Value Added course on "Product Design & Drafting By CATIA"-Request-Reg.

It is being brought to your kind notice that Department of ME organizing a Value Added course on Product Design & Drafting By CATIA from 06-02-2023 to 23-02-2023.at ME 206 from 4.P.M to 6 P.M.In This Regard I kindly request to provide the Permission and Financial assistance to procure the needs and smooth completion of the programme for which kind of act I Would be grateful to you sir.

Thanking you

Your's Faithfully

Dr.S.Shakeel Ahmed (Coordinator)

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KSNR

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Lr./KSRMCE/Dept. Of ME /2022-2023

Date:03/02/2023

#### Circular Circular

It is immense pleasure to inform that the Department of Mechanical Engineering conducting Value Added Course on "Product Design & Drafting By CATIA" 06-02-2023 to 23-02-2023 at ME 206 from 4P.M to 6P.M.In this Regard, Interested students are requested to register for the Value Added Course,

For the Registration, Please Contact

Course Coordinator :Dr.S.Shakeel Ahmed ,Associate Professor,Med.K.S.R.M.C.E

Contact No:9441404099

Department of Mechnical Engineering K.S.R.M. College of Engineering KADAPA - 516 003.

Cc to:

**IQAC-KSRMCE** 



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Date: 04-02-2023

### **DEPARTMENT OF MECHANICAL ENGINEERING**

#### REGISTRATION FORM

Value Added Course

On

"Product Design & Drafting by Catia" From 06/02/2023 to 23/02/2023

S.No	Full Name	Roll Number	Branch	Semester	G:
1	229Y5A0316	DILAMBA	ME	IV	D. Chonon Kur
2	229Y5A0317	DUDEKULA AMEER BASHA	ME	IV	<b>1</b>
3	229Y5A0318	DUDEKULA USMAN	ME	TY	Ars
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5	229Y5A0320	GATTA VENKATA SIVA	ME	IV IV	Kon
6	229Y5A0321	GOLLA SOMESH	ME	TYT	0
7	229Y5A0322	IMMAREDDY VENKATA SUBBA REDDY	ME	IV IV	SOBRA
8	229Y5A0323	KANAKADANDI VENKATA SAI KUMAR	ME	IV	Na)
9	229Y5A0324	KARIPIREDDY PRADEEP KUMAR REDDY	ME	IV	K. Prodeep Kuno Reddy
10	229Y5A0325	KARNATI NARESH REDDY	ME	IV	A Para
11	229Y5A0326	KUNCHAPU RAMESH	ME	TTT	
12	229Y5A0327	KUTHALA ADARSHA	ME	IV	Ramesh
13	229Y5A0328	M RAMESH	ME	IV	Holl
14	229Y5A0329	MADANAPURI YUGANDHAR	ME	IV IV	Yucarellon
15	229Y5A0330	MARAM RUTWIK MANI KANTH	ME	IV	M
16	229Y5A0331	MILLULLAGARI MANSOOR BASHA	ME	IV	M. Rutuik
17	229Y5A0332	MOOD ABHILASH NAIK	ME	IV	Marion Karty
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23	229Y5A0338	PASAM LOKCHAND YADAV	ME	IV	The state of the s
24	229Y5A0339	PEETLA HAREESH	ME	IV	
25	229Y5A0340	PERUGU NARESH BABU YADAV	ME	IV	
26	229Y5A0341	PITTALA SARATH SAI	ME	IV	- Joseph
27	229Y5A0342	POLIMERA PAVAN KUMAR	ME	IV	Daniel Contraction
28	229Y5A0343	RABBU MURALIKRISHNA	ME	IV	
29	229Y5A0344	RAGI MADHU	ME	IV	property of
30	229Y5A0345	SAYAVARAPU RAJENDRA	ME	IV	S. Pagen Ava
31	229Y5A0346	SHAIK HAMER KAMID	ME	IV	1
32	229Y5A0347	SHAIK MOHAMMED SADIQ	ME	IV	S As
33	229Y5A0348	SHAIK NAGOOR BASHA	ME	IV	She's K Nagoos busher
34	229Y5A0349	SREERAM SIVA	ME	IV	CO 200 Colone
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36	229Y5A0351	SYED MOHAMMED ABDULLA ADIL	ME	IV	Sight paid
37	229Y5A0352	TALARI CHARAN RAJ	ME	IV	The Day of
38	229Y5A0353	THUMMALURU MAHESH	ME	IV	1 da la la
39	229Y5A0354	UPPARA VINAY KUMAR	ME	IV	1 Para de
40	229Y5A0355	VADDE UPENDRA	ME	IV -	
41	229Y5A0356	VADDE UPENDRA	ME	IV	CHI CO
42	229Y5A0357	YAMIKA HARI BABU	ME	IV	4

Coordinator:

HOD
Professor & head
Department of Mechnical Engineering
K.S.R.M. College of Engineering
KADAPA - 516 003.

#### Syllabus of Value Added Course Course Name:

#### Product Design & Drafting by Catia

#### **Course Objectives:**

Upon completion of the CATIA V5 Fundamentals Course, the student is able to:

- Create and Save various types of CATIA V5 documents
- Differentiate and switch between a selection of workbenches
- Perform various tasks concerning 3D Navigation and geometry selection
- Create and constrain sketches
- Descibe the functinal capabilities and general usage of:Part Design,Generative Shape Design,Assembly Design

#### **Course Outcomes:**

- Use their capacity of vision to interpret and/or convey the technical information in an industrial drawing.
- Know and be able to apply graphical representation techniques using traditional metric geometry and descriptive geometry methods.
- Know, identify, interpret and apply the current standards on Industrial Technical Drawing.
- Computer aided design applications that allow students to elaborate and use graphical and technical information.

<u>UNIT-I</u> CATIA as a CAD software :- Concept of Parametric Modelling, Feature Based Modelling, User Interface, Mouse operations, File types and Management, drawing profiles. Major user industries of Catia. Why Catia is preferred?

<u>UNIT-II</u> sketcher: Profile toolbar, operation (corner, chamfer,relimitations, transformations, project 3D element), constriants, types of constraints, workbench. sketch tools, tools(Sketch sloving status, sketch analysis, output feature), visualization toolbar, user selection filter.

<u>UNIT-III</u> Material Addition and Removal (Pad, Pocket, Shaft, Groove), Sketch and Positioned Sketch, Types of Fillets, Types of Chamfer, Types of Hole. Advance Design features: Axis System, Types of draft, Shell, Stiffener, rib slot,

<u>UNIT-IV</u> Introduction to Assembly:- Types of assembly approach, Types of Constrains and DOF, placement of components in the Assembly, Manipulating Components, BOTTOM UP Approach TOP DOWN Approach:- Part, Product, Component, Space Analysis, Reuse Pattern, Save management.

<u>UNIT-V</u> Assembly Drafting:- Scene( Exploded View), Bill of material, Ballon creation, Graph Tree Reordering.

Text Books/Reference Books:

1.CATIA Books By Prof. Sham Tickoo

2.An Introduction to CATIA V5, Release 12 A Hands-On Tutorial Approach Kristie Plantenberg



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#### **SCHEDULE**

#### Department of Mechanical Engineering

Value Added Course

"Product Design & Drafting by Catia" From 06/02/2023 to 23/02/2023

Data			
Date	Timing	Resource Person	Topic to be covered
06-02-2023 AN	4 P.M to 6 P.M	U.Pradeep kumar	
07-02-2023 AN	4 P.M to 6 P.M	TID	Feature Based Modelling.
	4 F.M to 6 P.M	U.Pradeep kumar	User Interface, Mouse operations
08-02-2023 AN	4 P.M to 6 P.M	U.Pradeep kumar	File types and Management
		on radeep kumai	
			industries of Catia. Why Catia is
09-02-2023 AN	4 P.M to 6 P.M	TID	preferred
02 2023 THV	4 1.1VI to 6 P.1VI	U.Pradeep kumar	sketcher: Profile toolbar, operation
			(corner, chamfer, relimitations,
10.02.2022			transformations, project 3D element)
10-02-2023 AN	4 P.M to 6 P.M	U.Pradeep kumar	constraints, types of constraints,
	2	T	workbands about the training,
			workbench. sketch tools, tools(Sketch
			sloving status, sketch analysis, outpu
			feature), visualization toolbar, user
11-02-2023 AN	4 P.M to 6 P.M	II D I	selection filter
	. 1 .10 01 .101	U.Pradeep kumar	Material Addition and Removal (Pad.
			Pocket, Shaft, Groove). Sketch and
13-02-2023 AN	2 P.M to 6 P.M		Positioned Sketch,
02 2023 AIV	2 P.M to 6 P.M	U.Pradeep kumar	Types of Fillets, Types of Chamfer,
			Types of Hole. Advance Design
			features :- Axis System, Types of
1.02.2022 437			draft, Shell, Stiffener, rib slot,
4-02-2023 AN	2P.M to 6 P.M	U.Pradeep kumar	Introduction to Assembly:- Types of
		1	assembly approach T
			assembly approach, Types of
5-02-2023 AN	4 P.M to 6 P.M	U.Pradeep kumar	Constrains and DOF,
	1	radeep Kuillal	placement of components in the
6-02-2023 AN	4 P.M to 6 P.M	II Prodoor 1	Assembly, Manipulating Components
	111. 10 01 1.11	U.Pradeep kumar	BOTTOM UP Approach TOP DOWN
7-02-2023 AN	4 P.M to 6 P.M	IID	Approach: - Part, Product.
	11.1VI tO O F.IVI	U.Pradeep kumar	Component, Space Analysis Reuse
			Pattern, Save management.

18-02-2023 AN	4 P.M to 6 P.M	U.Pradeep kumar	Assembly Drafting:- Scene(
			Exploded View)
20-02-2023 AN	4 P.M to 6 P.M	U.Pradeep kumar	Bill of material,
21-02-2023 AN	4 P.M to 6 P.M	II Dua da a 1	D 11
21 02 2025 1111	7 1 .WI to 0 F .WI	U.Pradeep kumar	Ballon creation, Graph Tree
22 22 22			Reordering.
22-02-2023 AN	4 P.M to 6 P.M	U.Pradeep kumar	Practice of diagram, validation and
			distribution of certificates
23-02-2023 A.N	4 P.M to 6 P.M	U.Pradeep kumar	Practice session of Assembling
			components, valedictory and
			Distribution of certificates

Coordinator(s)

HOD Professor & Head

Department of Mechnical Engineering
K.S.R.M. College of Engineering
KADAPA - 516 003.



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#### **DEPARTMENT OF MECHANICAL ENGINEERING**

Attendance sheet of Value Added course on "Product Design & Drafting by Catia " From 06/02/2023 to 23/02/2023

SI. No.	Roll No.	Name	06/2	07/2	08/2	09/2	10/2	11/2	13/2	14/2	15/2	16/2	17/2	18/2	20/2	21/2	22/2	23/2
1	229Y5A0316	DHANYASI CHARAN KUMAR	ch	Que	de	Ovi	Da	cha	Dy	A	250	Da	ele	20	On	che	de	ca
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5	229Y5A0320	GATTA VENKATA SIVA	8	B	8	8	-8	-8	-8	5	8	8	8	2	2	2	5	2
6	229Y5A0321	GOLLA SOMESH	200	de	al &	0	6		6	6	R	0	A	0		8	20	0
7	229Y5A0322	IMMAREDDY VENKATA SUBBA REDDY	SR	SR	SR	A	SB	Sh	SR	SR	R	SR	SR	SR	SR	SR	SR	SPR
8	229Y5A0323	KANAKADANDI VENKATA SAI KUMAR	18	B	\$	A C	1/3	WS.	W	18	A-	S	IA	X	B	A	A	10
9	229Y5A0324	KARIPIREDDY PRADEEP KUMAR REDDY	A	1	A.	H	*	X	X.	X-	*	8	F	B	*	7	*	*

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10	229Y5A0325	NARESH REDDY	NK	NR	M	NR	M	NR	nR	M	MK	NK	NR	pr	NR	NR	NR	NA
11	229Y5A0326	KUNCHAPU RAMESH	Ranud	Lamel	Panh	Land	Rand	Karny	Romen	Loud	Kant	Seus L-	Roud	Raed	Land	Don 1	Rand	Part
2	229Y5A0327	KUTHALA ADARSHA	Adam	Alam	Ader	Adal	Dolos	Adon	Adead	Adead	Als	Ado	10	Alas	AL	Ad.	12	Al
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4	229Y5A0329	MADANAPURI YUGANDHAR	yug	Jougo	Yun	Hlye	yua	yla	Hear	YUD	Hug	Huer	Ha	410	N	Him	412	40
5	229Y5A0330	MARAM RUTWIK MANI KANTH	A	DAR	AAP	DAT	me		NA	200	M			pp	M	M	A	M
6	229Y5A0331	MILLULLAGARI MANSOOR BASHA	ADO	A	m	M	A	PAS	A	A	A	M			(A)	A	A	A
7	229Y5A0332	MOOD ABHILASH NAIK	Du	A	A.	Ru	R	A.	6	R.	R	R	R	R	A	OR.	R.	
8	229Y5A0333	NAGIRIDONE MURALI KRISHNA	APP	2	M	M	M	DAR		Aso	M	)			1/2	M	M	· Im
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2	229Y5A0337	PASALA UDAY KUMAR	PD.	TID	LON	til	100	COL	CA	Al	th	A	00	0		× l	109	
3	229Y5A0338	PASAM LOKCHAND YADAV	Cak	Lob	lob	lob	Ide	lot	Coh	Cob	lok	100	Cob	106	100	(0)	(2)	106
4	229Y5A0339	PEETLA HAREESH	A	1	1	A	1	1	A		1	A	A	100	COB	300	(ob	-11
5	229Y5A0340	PERUGU NARESH BABU YADAV	Ab	300		A	#	A	A	Ab	A	A		10	1	A	1	The state of the s
5	229Y5A0341	PITTALA SARATH SAI			6	2	2		0	2	0	P	R C	0	2	0	1	<b>1</b>
7	229Y5A0342	POLIMERA PAVAN KUMAR	Par	Par	Ker	Yav	Vew	Day	Par	Vou	121	Par	Ver	12	Bu	12.	12.	Par
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	229Y5A0345	SAYAVARAPU RAJENDRA	Ba	Ra	Ha	DA	Po	Por	800	Pa	0	-	8	18	Pla	RA	PD	W

31	229Y5A0346	SHAIK HAMER KAMID	Dun	Hour	Aun	A	Down	-Down	Hem	Home	Herra.	Jour	Spire.	Ham	Many	Ala	Herry	Ham
32	229Y5A0347	SHAIK MOHAMMED SADIQ	Sul	90	Sul	Sul	SM	Sul	SM	Sino	Gus	<u>A</u>	SM	gyp.	SYD	A	Sab	Sup
33	229Y5A0348	SHAIK NAGOOR BASHA	SA	SA	SA	80	SA	80 c	SA	8A	SA	SA	50	<b>S</b> A	A	SA	54	SA
34	229Y5A0349	SREERAM SIVA	5	88	80		800	80	8	86	Si	Sô	81	, S	50	85	G.	8
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	n							1		V			7			- (		

Coordinator(s)

HoD

Professor & Head

Department of Mechnical Engineering
K.S.R.M. College of Engineering
KADAPA - 516 003.



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#### A VALUE ADDED COURSE ON "PRODUCT DESIGN & DRAFTING BY CATIA"



**Dept.of Mechanical** 

ME 206

Resource Person

06-02-2023 to18-02-2023

Sri U Pradeep Kumar Assistant Professor, Dept. of ME, KSRMCE

coordinator

Dr.S.Shakeel Ahmed

Dr. Kandula Chandra Obul Reddy (MD, KGI)

Sri K. Madan Mohan Reddy (Vice - Chairman)

Sri K. Raja Mohan Reddy (Chairman)

(e) 8143731980, 8575697569

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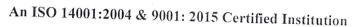




#### (UGC-AUTONOMOUS)

Kadapa, Andhra Pradesh, India-516 003







Activity Report of

Value Added Course on "Product Design & Drafting by Catia" From 06/02/2023 to 23/02/2023

Target Group

B. Tech Students

**Details of Participants** 

42 Students

Co-coordinator(s)

Dr.S.Shakeel Ahamed

Resource Person(s)

Sri U.Pradeep Kumar

**Organizing Department** 

Mechanical Engineering

Venue

:

ME 206, Mechanical Department

Description:

Department of Mechanical Engineering along with MEA has organized a Value added course on "Product Design & Drafting by CATIA" from 06th February 2023 to 23th February 2023. The course Resource Person is Sri U Pradeep Kumar, Assistant Professor, and Department of ME.

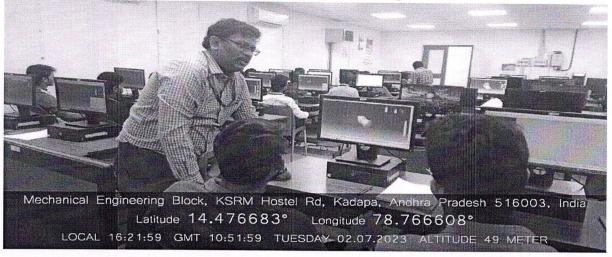
The main objective of this course is CATIA that stands for Computer Aided Three-Dimensional Interactive Application. It's much more than a CAD (Computer Aided Design) software package. It's a full software suite which incorporates CAD, CAE (Computer-Aided Engineering) and CAM (Computer-Aided

The first release of CATIA was back in 1977 by Dassault Systems, who still maintain and develop the software.

This course started with Explaining importance of CAD software's in present mechanical industries role of CAD/CAE/CAM. CATIA workshop has two sessions. Theory session and Practice Session. In Theory session they have undergone various Sketch tool bars and commands in 2D & 3D.and in practice session they have been practiced those tools with practicing diagrams given for them. They are also under gone assembly module and practiced various parts given to them in practicing session

On final Day last session workshop Ended with oath of thanks and certificate distribution by coordinator & HOD to the Participants. Feedback from participants are collected

**Photos** The pictures taken during the course are given below:

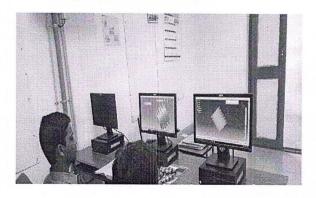


Resource Person Sri U.Pradeep Kumar Asst.Professor in MED Giving Training and clearing doubts



Students Listening to lecture during course





Students Practice session



Certificates Distribution by the HoD Dr.D.Ravikanth

Coordinator(s)

Professor & Head

Department of Mechnical Engineering
K.S.R.M. College of Engineering
KADAPA - 516 003.



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## Certificate of Completion

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111112	IV	CELLITY	IIIWI	1411 / 1411 9"	I MINAVIIND	Beuring
						96

the Roll Number 229Y5A0334 has Successfully Completed Value Added

Course on "Product Design & Drafting By CATIA" from 06/02/23 to 23/02/23,

Organized by Department of Mechanical Engineering, KSRMCE, Kadapa.

Coordinator

a. Inilase.

HOD ME

Principal



#### K.S.R.M. COL

(UGC - Autonomous)

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## Certificate of Completion

This to certify that Mr/Mrs. U.VINAY KUMAR

Bearing

the Roll Number 229Y5A0354

has Successfully Completed Value Added

Course on "Product Design & Drafting By CATIA" from 06/02/23 to 23/02/23,

Organized by Department of Mechanical Engineering, KSRMCE, Kadapa.

Coordinator

HOD ME

Principal



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## Certificate of Completion

This to certify that Mr/Mrs. G VENKATA SIVA Bearing

the Roll Number 229Y5A0320 has Successfully Completed Value Added

Course on "Product Design & Drafting By CATIA" from 06/02/23 to 23/02/23,

Organized by Department of Mechanical Engineering, KSRMCE, Kadapa.

-97

Coordinator

C. Iniland.

HOD ME

Principal

# Feed Back Form for Value Added Course On Product design & Drafting By CATIA 06/02/2023 to 23/02/2023

From Dept of Mechanical Engineering K.S.R.M.C.E

* In	dicates required question
1.	Email *
2.	1.Email *
3.	2.Name of the Participant *
4.	3.Name of the college/Institution *
5.	4.Semester and Section *

	6.	5.Is the seminar met your Expectations? *
		Mark only one oval.
		Strongly disagree  Disagree  Agree  Strongly Agree
	7.	6.How Would you rate the content of Guest Lecture?
		Mark only one oval.
)		Poor
		Ok Good
		Excellent
	8.	7.is Speaker Lecture clear and understanding *
		Mark only one oval.
		Yes
•		○ No
,		
	9.	8.Suggestions if any *

This content is neither created nor endorsed by Google.

Feed Back Form for Value Added course On Product design & Drafting By CATIA (Responses) 06-02-2023 to 23-02-2023

S.No		Email Address	2.Name of the Participan			<del></del>			
1	2-24-2023 14:19:56	229y5a0316@ksrmce.ac.in	Danyasi Charan Kumar	srm college	3rd and B section	Agree	Good	Yes	I want extra class from catia
2	2-24-2023 14:22:12	229y5a0317@ksrmce.ac.in	Dudekula Ameerbasha	llege of En		Agree	Agree	Yes	We need more work shops like this
3	2-24-2023 14:23:15	229y5a0318@ksrmce.ac.in	D Usman	KSRMCE	3rd sem	Agree	Agree	Yes	Good
4	2-24-2023 9:29:58	229y5a0319@ksrmce.ac.in	E Pramod	Ksrm college of engineerin g	3rd sem/B- section	Strongly Agree	Excellent	Yes	Good
5	2-24-2023 19:57:49	229y5a0320@ksrmce.ac.in	G VENKATA SIVA		∄ Sem and B secti		Good	Yes	Course duration is less to grab more content. It is better to expand course duration.
6	2-24-2023 14:17:16	229y5a0321@ksrmce.ac.in	G.somesh		rd semester - b/ se		Good	Yes	It will be conducted me more
7	2-24-2023 14:20:58	229y5a0322@ksrmce.ac.in	I.Venkata Subbareddy	llege of eng	semester B/secti	Agree	Good	Yes	It is a very helpful
8	2-24-2023 14:14:54	229y5a0323@ksrmce.ac.in	K.venkata sai kumar	lege of engi	3rd sem - B/S	Agree	Excellent	Yes	NoneAnd the classes are highly useful andI gained some skillThrough this workshop
9	2-24-2023 14:18:11	229y5a0324@ksrmce.ac.in	K.pradeep kumar reddy	e of engine	3rd sem-Bsec	Strongly Agree	Excellent	Yes	We need more like this activity
10	2-24-2023 14:18:42	229y5a0325@ksrmce.ac.in	natinareshreddy0@gmail.			Agree	Excellent	Yes	Good
11	2-24-2023 14:29:20	229y5a0326@ksrmce.ac.in			d semester B-sect		Good	Yes	Improve to speak loudly
12	2-24-2023 14:22:03	229y5a0327@ksrmce.ac.in	K. ADARSHA	llege of eng	semester B-sect	Agree	Good	Yes	Nothing
13	2-24-2023 14:19:06	229y5a0328@ksrmce.ac.in	M Ramesh	RM KADA	3. B/s	Agree	Excellent	Yes	We more faculty this type of programs
14	2-24-2023 14:16:14	229y5a0329@ksrmce.ac.in	M. Yugandhar	dy memoria	3rd sem/b section	Strongly Agree	Excellent	Yes	No suggestions
15	2-24-2023 14:16:09	229y5a0330@ksrmce.ac.in	M.Rutwik mani kanth		3-sem/b section	- 7		Yes	We need more workshops like this
16	2-24-2023 14:16:42	229y5a0331@ksrmce.ac.in	M.Mansoor Basha		3rd sem B section			Yes	Better understanding
17	2-24-2023 14:20:09	229y5a0332@ksrmce.ac.in			semester /B section		Excellent	Yes	Excellent
18	2-24-2023 14:23:25	229y5a0333@ksrmce.ac.in	IRIDONE MURALI KRISI	e of Engine	sem /mech -B sec	Agree	Good	Yes	It is very good
19	2-24-2023 14:16:41	229y5a0334@ksrmce.ac.in			3 rd semister B/S			Yes	WE NEED MORE THIS TYPE OF ACTIVITIES
20	2-24-2023 14:14:45	229y5a0335@ksrmce.ac.in	Paidipalem shameer bash	Ksrmce		Strongly Agree	Excellent	Yes	No
21	2-24-2023 14:21:18	229y5a0336@ksrmce.ac.in	Palli Mallikarjuna		3 rd sem B-section	Agree	Excellent	Yes	Good
22	2-24-2023 14:16:52	229y5a0337@ksrmce.ac.in	P.Uday Kumar		3-sem and B/s	Agree	Excellent	Yes	Good Knowledge
23	2-24-2023 9:30:56	229y5a0338@ksrmce.ac.in			Rd sem/ B section		Excellent	Yes	We need more time to learn more
24	2-24-2023 14:15:28	229y5a0339@ksrmce.ac.in			d semister/B- secti		Excellent	Yes	No
25	2-24-2023 14:16:40	229y5a0340@ksrmce.ac.in			3sem B section			Yes	No
26	2-24-2023 9:33:17	229y5a0341@ksrmce.ac.in			3 sem b section	Agree	Excellent	Yes	We need more time to learn more
27	2-24-2023 9:33:32	229y5a0342@ksrmce.ac.in	P.pavan kumar	llege of eng	3rd sem 2nd year	Strongly Agree	Excellent	Yes	To give some more diffcult diagrams

28	2-24-2023 14:20:48	James 18 Control 1110C. CC. III	R.MURALI KRISHNA	RM COLLE	3rdsem (B/S)				
29	2-24-2023 14:20:14	229y5a0344@ksrmce.ac.in	R madhu			Agree	Good	Yes	Nothing
30	2-24-2023 14:16:37	229y5a0345@ksrmce.ac.in	S rajendra	ollege of o	Brd sem ,B section	n Strongly Agree	Good	Yes	Nothing
31	2-24-2023 14:15:47	229y5a0346@ksrmce.ac.in		logo of one	semester/Bsection	Strongly Agree		Yes	Excellent
32	2-24-2023 14:16:49	229y5a0347@ksrmce.ac.in		llege of eng	d semester B/sect	Agree	Excellent	Yes	No
33	2-24-2023 9:31:43	229y5a0348@ksrmce.ac.in	Shaik Mohammed Sadiq Shaik.Nagoor Basha	riege of eng	ra sem - B - sectio	Strongly Agree	Excellent	Yes	No suggestions.
34	2-24-2023 9:30:08	229y5a0349@ksrmce.ac.in		KSRIVI CE	semester & B-sec	Agree	Good	Yes	Nothing
35	2-24-2023 14:17:33	229y5a0350@ksrmce.ac.in	SUGALI SHIVAJI NAIK	EGE OF EN	MISTER(B)SEC	Strongly Agree	Excellent	Yes	Better Explanation
36	2-24-2023 14:17:18	229y5a0351@ksrmce.ac.in			semister B/Secti	Strongly Agree	Excellent	Yes	Better understanding
37	2-24-2023 14:56:33	229y5a0352@ksrmce.ac.in	ved mohammed abdulla a	lege of eng	3rd-sem-B section	Strongly Agree	Excellent	Yes	no suggestions
38	2-24-2023 14:18:34	229y5a0353@ksrmce.ac.in	i charan raj	llege of eng	3sem B section	Agree	Excellent	Yes	
39	2-24-2023 18:22:27	229y5a0354@ksrmce.ac.in	T. Mahesh	college of e	3rd sem B-section	Agree	Good	Yes	No suggestion
40			U VINAYKUMAR	EGE OF E	3rd	Agree	Excellent	Yes	No No
	2-24-2023 14:17:03	229y5a0355@ksrmce.ac.in	VADDE UPENDRA	Ksrmce	3rd sem,B/section				Provide more time to learn
	2-24-2023 14:18:47	229y5a0356@ksrmce.ac.in		INFERING	DD 05111,D/Section	Strongly Agree	Excellent	Yes	We need more time to good
42	2-24-2023 14:18:08	229y5a0357@ksrmce.ac.in	V 11		RD SEMESTER B	Agree	Good	Yes	understanding Ntg
	Α.	, service ac.iii	1. Hall babu	llege of eng	3rd sem, B/S	Agree	Excellent	Yes	Voice clarity
	<b>U</b>								- VOICE CIATILY

COORDINATOR

HODH

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#### K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA-516003 DEPARTMENT OF MECHANICAL ENGINEERING VALUE ADDED COURSE ON

## PRODUCT DESIGN&DRAFTING BY CATIA FROM 06/02/2023 TO 23/02/2023 AWARD LIST

S.No	Roll Number	Name of the Student	Marks Obtained
1	229Y5A0316	DHANYASI CHARAN KUMAR	17
2	229Y5A0317	DUDEKULA AMEER BASHA	15
3	229Y5A0318	DUDEKULA USMAN	16
4	229Y5A0319	EBBILI PRAMOD	18
5	229Y5A0320	GATTA VENKATA SIVA	18
6	229Y5A0321	GOLLA SOMESH	14
7	229Y5A0322	IMMAREDDY VENKATA SUBBA REDDY	17
8	229Y5A0323	KANAKADANDI VENKATA SAI KUMAR	15
9	229Y5A0324	KARIPIREDDY PRADEEP KUMAR REDDY	13
10	229Y5A0325	KARNATI NARESH REDDY	12
11	229Y5A0326	KUNCHAPU RAMESH	19
12	229Y5A0327	KUTHALA ADARSHA	17
13	229Y5A0328	M RAMESH	16
14	229Y5A0329	MADANAPURI YUGANDHAR	17
15	229Y5A0330	MARAM RUTWIK MANI KANTH	17
16	229Y5A0331	MILLULLAGARI MANSOOR BASHA	17
17	229Y5A0332	MOOD ABHILASH NAIK	14
18	229Y5A0333	NAGIRIDONE MURALI KRISHNA	16
19	229Y5A0334	P ARAVIND	19
20	229Y5A0335	PAIDIPALEM SHAMEER BASHA	17
21	229Y5A0336	PALLI MALLIKARJUNA	18
22	229Y5A0337	PASALA UDAY KUMAR	19
23	229Y5A0338	PASAM LOKCHAND YADAV	18
24	229Y5A0339	PEETLA HAREESH	16
25	229Y5A0340	PERUGU NARESH BABU YADAV	14
26	229Y5A0341	PITTALA SARATH SAI	16
27	229Y5A0342	POLIMERA PAVAN KUMAR	17
28	229Y5A0343	RABBU MURALIKRISHNA	18
29	229Y5A0344	RAGI MADHU	17
30	229Y5A0345	SAYAVARAPU RAJENDRA	18
31	229Y5A0346	SHAIK HAMER KAMID	14
32	229Y5A0347	SHAIK MOHAMMED SADIQ	13
33	229Y5A0348	SHAIK NAGOOR BASHA	13
34	229Y5A0349	SREERAM SIVA	17
35	229Y5A0350	SUGALI SHIVAJI NAIK	
36	229Y5A0351	SYED MOHAMMED ABDULLA ADIL	18
37	229Y5A0352	TALARI CHARAN RAJ	16
38	229Y5A0353	THUMMALURU MAHESH	17
39	229Y5A0354	UPPARA VINAY KUMAR	17 18

40	229Y5A0355	VADDE UPENDRA	18
41	229Y5A0356	VADDE UPENDRA	17
42	229Y5A0357	YAMIKA HARI BABU	14

HoD

Professor & Head

Department of Mechnical Engineering
K.S.R.M. College of Engineering
KADAPA - 516 003.

#### K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA-516003 DEPARTMENT OF MECHANICAL ENGINEERING VALUE ADDED /CERTIFICATE COURSE ON

#### Product Design & Drafting By CATIA FROM 06/02/2023 To 23/02/2023

Roll Number: 229 Y5 Ao 328 Name of the Student: R. MAHES H. (Objective Questions) Time: 20 Min Note: Answer the following Questions and each question carries **one** mark. Of course, here are twenty more objective questions related to CATIA: 1. Which CATIA workbench is primarily used for creating and editing 3D parametric models?  $[\mathcal{F}]$ a) Part Design b) Assembly Design c) Drafting d) Generative Shape Design 2. What is the function of the "Extrude" tool in the Part Design workbench? a) To create a mirror image of a part b) To add fillets to a part c) To create a 3D shape by extending a 2D sketch d) To assemble multiple parts into a product 3. Which workbench allows you to define how parts move and interact within an assembly? a) Part Design b) Assembly Design c) Generative Shape Design d) Wireframe and Surface Design [A]4. In CATIA, what is the purpose of the "Pattern" feature? a) To create a repeating array of features b) To simulate the motion of parts in an assembly c) To add textures and colors to a part d) To analyze stress distribution in a design 5. What does the term "Assembly Constraints" refer to in CATIA? [B] a) A measure of a part's complexity b) The rules that define how parts are positioned and interact in an assembly c) The number of features in a 3D model d) The color scheme used in an assembly 6. Which workbench would you use to create and edit complex curves and surfaces in [C]CATIA? a) Part Design

b) Assembly Design

c) Generative Shape Design

d) Wireframe and Surface Design

<ul><li>7. What is the purpose of the "Drafting" workbench in CATIA?</li><li>a) To create 3D parametric models</li><li>b) To perform structural analysis on a part</li><li>c) To create detailed engineering drawings for manufacturing</li><li>d) To add visual effects to a part</li></ul>	[C]
<ul><li>8. Which tool is used to round off sharp edges or corners on a 3D part in CATIA?</li><li>a) Extrude</li><li>b) Chamfer</li><li>c) Revolve</li><li>d) Loft</li></ul>	
<ul> <li>9. What is the main purpose of the "DMU Kinematics" workbench in CATIA?</li> <li>a) To analyze the thermal properties of a material</li> <li>b) To perform fluid dynamics simulations</li> <li>c) To simulate the motion of parts and mechanisms</li> <li>d) To create parametric models</li> </ul>	
<ul> <li>10. Which workbench is suitable for creating 2D profiles that can be later used for creating?</li> <li>a) Part Design</li> <li>b) Assembly Design</li> <li>c) Drafting</li> <li>d) Wireframe and Surface Design</li> </ul>	reating [Ø]
<ul> <li>11. In the context of the Assembly Design workbench, what does "Degrees of Freed to?</li> <li>a) The complexity of the parts in an assembly</li> <li>b) The ability of parts to move independently within an assembly</li> <li>c) The number of components in an assembly</li> <li>d) The total mass of the assembly</li> </ul>	om" refer
<ul><li>12. What is the purpose of the "Revolve" feature in CATIA?</li><li>a) To create a symmetrical 3D shape by rotating a profile around an axis</li><li>b) To add draft angles to a part</li><li>c) To create a pattern of features</li><li>d) To simulate the flow of electricity through a design</li></ul>	[p]
<ul> <li>13. Which workbench in CATIA would you use to analyze the structural integrity of assembly?</li> <li>a) Part Design</li> <li>b) Assembly Design</li> <li>c) Drafting</li> <li>d) Analysis &amp; Simulation</li> </ul>	f a part or
<ul> <li>14. What does the "Mirror" tool do in CATIA's Part Design workbench?</li> <li>a) It reflects the part's geometry across a specified plane</li> <li>b) It creates a duplicate of the part</li> <li>c) It adds a pattern of features</li> <li>d) It rounds off sharp edges</li> </ul>	

<ul><li>15. In CATIA, what is the purpose of the "Generative Shape Design" workbench?</li><li>a) To create parametric 3D models</li><li>b) To create and edit complex curves and surfaces</li><li>c) To simulate the motion of parts in an assembly</li><li>d) To perform stress analysis</li></ul>	(b)
<ul><li>16. Which feature is used to remove material from a 3D part in CATIA?</li><li>a) Fillet</li><li>b) Pad</li><li>c) Draft</li><li>d) Rib</li></ul>	
17. What is the purpose of the "Constraint with Formula" tool in the Sketcher workbend	ch?
<ul><li>a) To apply geometric constraints between sketch elements</li><li>b) To calculate the surface area of a sketch</li><li>c) To define the color of sketch elements</li><li>d) To create complex curves</li></ul>	[00]
<ul> <li>18. What is the main purpose of the "Draft Analysis" tool in CATIA's Part Design workbench?</li> <li>a) To analyze the thermal properties of a part</li> <li>b) To check for undercuts and proper mold release in a design</li> <li>c) To create drafts on a part's edges</li> <li>d) To perform stress analysis on a part</li> </ul>	[ ]
<ul> <li>19. Which workbench in CATIA allows you to create parametric models by combining multiple solid and surface features?</li> <li>a) Part Design</li> <li>b) Assembly Design</li> <li>c) Generative Shape Design</li> <li>d) Wireframe and Surface Design</li> </ul>	
<ul> <li>20. What is the primary purpose of the "Human Builder" tool in CATIA?</li> <li>a) To create parametric models of humans for ergonomic studies</li> <li>b) To design clothing and accessories</li> <li>c) To simulate human-like movements in an assembly</li> <li>d) To analyze the human body's thermal properties</li> </ul>	[ ]

#### K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA-516003 DEPARTMENT OF MECHANICAL ENGINEERING

#### VALUE ADDED /CERTIFICATE COURSE ON

#### Product Design & Drafting By CATIA FROM 06/02/2023 To 23/02/2023

	ASSESS	ME	N	$\Gamma T$	EST	^	^	0	. 1		^
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Roll Number: SHAIX	HAMER	Name of the Student:	22975	H0346
,	KAMIP			

(Objective Questions) Max.Marks: 20 Time: 20 Min

Note: Answer the following Questions and each question carries **one** mark. Of course, here are twenty more objective questions related to CATIA:

- 1. Which CATIA workbench is primarily used for creating and editing 3D parametric [A]models?
  - a) Part Design
  - b) Assembly Design
  - c) Drafting
  - d) Generative Shape Design
- 2. What is the function of the "Extrude" tool in the Part Design workbench?
  - a) To create a mirror image of a part
  - b) To add fillets to a part
  - c) To create a 3D shape by extending a 2D sketch
  - d) To assemble multiple parts into a product
- 3. Which workbench allows you to define how parts move and interact within an assembly? [3]
  - a) Part Design
  - b) Assembly Design
  - c) Generative Shape Design
  - d) Wireframe and Surface Design
- 4. In CATIA, what is the purpose of the "Pattern" feature?
  - a) To create a repeating array of features
  - b) To simulate the motion of parts in an assembly
  - c) To add textures and colors to a part
  - d) To analyze stress distribution in a design
- 5. What does the term "Assembly Constraints" refer to in CATIA?
- a) A measure of a part's complexity b) The rules that define how parts are positioned and interact in an assembly
- c) The number of features in a 3D model
- d) The color scheme used in an assembly
- 6. Which workbench would you use to create and edit complex curves and surfaces in [ C] \ CATIA?

[C]

- a) Part Design
- b) Assembly Design
- c) Generative Shape Design
- d) Wireframe and Surface Design

<ul><li>7. What is the purpose of the "Drafting" workbench in CATIA?</li><li>a) To create 3D parametric models</li><li>b) To perform structural analysis on a part</li><li>c) To create detailed engineering drawings for manufacturing</li><li>d) To add visual effects to a part</li></ul>	
<ul><li>8. Which tool is used to round off sharp edges or corners on a 3D part in CATIA?</li><li>a) Extrude</li><li>b) Chamfer</li><li>c) Revolve</li><li>d) Loft</li></ul>	
<ul> <li>9. What is the main purpose of the "DMU Kinematics" workbench in CATIA?</li> <li>a) To analyze the thermal properties of a material</li> <li>b) To perform fluid dynamics simulations</li> <li>c) To simulate the motion of parts and mechanisms</li> <li>d) To create parametric models</li> </ul>	[c]
<ul> <li>10. Which workbench is suitable for creating 2D profiles that can be later used for creating 3D features?</li> <li>a) Part Design</li> <li>b) Assembly Design</li> <li>c) Drafting</li> <li>d) Wireframe and Surface Design</li> </ul>	ating
<ul><li>11. In the context of the Assembly Design workbench, what does "Degrees of Freedor to?</li><li>a) The complexity of the parts in an assembly</li><li>b) The ability of parts to move independently within an assembly</li><li>c) The number of components in an assembly</li><li>d) The total mass of the assembly</li></ul>	m" refer
<ul><li>12. What is the purpose of the "Revolve" feature in CATIA?</li><li>a) To create a symmetrical 3D shape by rotating a profile around an axis</li><li>b) To add draft angles to a part</li><li>c) To create a pattern of features</li><li>d) To simulate the flow of electricity through a design</li></ul>	[o]] <sup>~</sup>
<ul> <li>13. Which workbench in CATIA would you use to analyze the structural integrity of a assembly?</li> <li>a) Part Design</li> <li>b) Assembly Design</li> <li>c) Drafting</li> <li>d) Analysis &amp; Simulation</li> </ul>	part or
<ul><li>14. What does the "Mirror" tool do in CATIA's Part Design workbench?</li><li>a) It reflects the part's geometry across a specified plane</li><li>b) It creates a duplicate of the part</li><li>c) It adds a pattern of features</li><li>d) It rounds off sharp edges</li></ul>	[o]]~

<ul> <li>15. In CATIA, what is the purpose of the "Generative Shape Design" workbench?</li> <li>a) To create parametric 3D models</li> <li>b) To create and edit complex curves and surfaces</li> <li>c) To simulate the motion of parts in an assembly</li> <li>d) To perform stress analysis</li> </ul>	[6]
<ul><li>16. Which feature is used to remove material from a 3D part in CATIA?</li><li>a) Fillet</li><li>b) Pad</li><li>c) Draft</li><li>d) Rib</li></ul>	
<ul> <li>17. What is the purpose of the "Constraint with Formula" tool in the Sketcher workben</li> <li>a) To apply geometric constraints between sketch elements</li> <li>b) To calculate the surface area of a sketch</li> <li>c) To define the color of sketch elements</li> <li>d) To create complex curves</li> </ul>	ich?
<ul> <li>18. What is the main purpose of the "Draft Analysis" tool in CATIA's Part Design workbench?</li> <li>a) To analyze the thermal properties of a part</li> <li>b) To check for undercuts and proper mold release in a design</li> <li>c) To create drafts on a part's edges</li> <li>d) To perform stress analysis on a part</li> </ul>	[6]
<ul> <li>19. Which workbench in CATIA allows you to create parametric models by combining multiple solid and surface features?</li> <li>a) Part Design</li> <li>b) Assembly Design</li> <li>c) Generative Shape Design</li> <li>d) Wireframe and Surface Design</li> </ul>	g [ ω]
<ul><li>20. What is the primary purpose of the "Human Builder" tool in CATIA?</li><li>a) To create parametric models of humans for ergonomic studies</li><li>b) To design clothing and accessories</li><li>c) To simulate human-like movements in an assembly</li><li>d) To analyze the human body's thermal properties</li></ul>	[6] 🗴

#### K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA-516003 DEPARTMENT OF MECHANICAL ENGINEERING VALUE ADDED /CERTIFICATE COURSE ON

Product Design & Drafting By CATIA FROM 06/02/2023 To 23/02/2023

Roll Number: 229 75A0 350 Name of the Student: 5. Shivari Nork.

Time: 20 Min (Objective Questions) Max.Marks: 20 Note: Answer the following Questions and each question carries **one** mark. Of course, here are twenty more objective questions related to CATIA: 1. Which CATIA workbench is primarily used for creating and editing 3D parametric  $[\omega]$ models? a) Part Design b) Assembly Design c) Drafting d) Generative Shape Design [C]\ 2. What is the function of the "Extrude" tool in the Part Design workbench? a) To create a mirror image of a part b) To add fillets to a part c) To create a 3D shape by extending a 2D sketch d) To assemble multiple parts into a product 3. Which workbench allows you to define how parts move and interact within an assembly? a) Part Design b) Assembly Design c) Generative Shape Design d) Wireframe and Surface Design 4. In CATIA, what is the purpose of the "Pattern" feature? a) To create a repeating array of features b) To simulate the motion of parts in an assembly c) To add textures and colors to a part d) To analyze stress distribution in a design 5. What does the term "Assembly Constraints" refer to in CATIA? a) A measure of a part's complexity b) The rules that define how parts are positioned and interact in an assembly c) The number of features in a 3D model d) The color scheme used in an assembly 6. Which workbench would you use to create and edit complex curves and surfaces in CATIA? [C]a) Part Design b) Assembly Design

c) Generative Shape Designd) Wireframe and Surface Design

<ul> <li>7. What is the purpose of the "Drafting" workbench in CATIA?</li> <li>a) To create 3D parametric models</li> <li>b) To perform structural analysis on a part</li> <li>c) To create detailed engineering drawings for manufacturing</li> <li>d) To add visual effects to a part</li> </ul>	
<ul><li>8. Which tool is used to round off sharp edges or corners on a 3D part in CATIA?</li><li>a) Extrude</li><li>b) Chamfer</li><li>c) Revolve</li><li>d) Loft</li></ul>	· [b]~
<ul> <li>9. What is the main purpose of the "DMU Kinematics" workbench in CATIA?</li> <li>a) To analyze the thermal properties of a material</li> <li>b) To perform fluid dynamics simulations</li> <li>c) To simulate the motion of parts and mechanisms</li> <li>d) To create parametric models</li> </ul>	[0]~
<ul> <li>10. Which workbench is suitable for creating 2D profiles that can be later used for creating 2D features?</li> <li>a) Part Design</li> <li>b) Assembly Design</li> <li>c) Drafting</li> <li>d) Wireframe and Surface Design</li> </ul>	ating [A]
<ul><li>11. In the context of the Assembly Design workbench, what does "Degrees of Freedor to?</li><li>a) The complexity of the parts in an assembly</li><li>b) The ability of parts to move independently within an assembly</li><li>c) The number of components in an assembly</li><li>d) The total mass of the assembly</li></ul>	n" refer
<ul><li>12. What is the purpose of the "Revolve" feature in CATIA?</li><li>a) To create a symmetrical 3D shape by rotating a profile around an axis</li><li>b) To add draft angles to a part</li><li>c) To create a pattern of features</li><li>d) To simulate the flow of electricity through a design</li></ul>	[ <del>\o</del> j]~
13. Which workbench in CATIA would you use to analyze the structural integrity of a assembly?  a) Part Design b) Assembly Design c) Drafting d) Analysis & Simulation	a part or
<ul> <li>14. What does the "Mirror" tool do in CATIA's Part Design workbench?</li> <li>a) It reflects the part's geometry across a specified plane</li> <li>b) It creates a duplicate of the part</li> <li>c) It adds a pattern of features</li> <li>d) It rounds off sharp edges</li> </ul>	[ω]

<ul><li>15. In CATIA, what is the purpose of the "Generative Shape Design" workbench?</li><li>a) To create parametric 3D models</li><li>b) To create and edit complex curves and surfaces</li><li>c) To simulate the motion of parts in an assembly</li><li>d) To perform stress analysis</li></ul>	[6]
<ul><li>16. Which feature is used to remove material from a 3D part in CATIA?</li><li>a) Fillet</li><li>b) Pad</li><li>c) Draft</li><li>d) Rib</li></ul>	[6] V
17. What is the purpose of the "Constraint with Formula" tool in the Sketcher workber a) To apply geometric constraints between sketch elements b) To calculate the surface area of a sketch c) To define the color of sketch elements d) To create complex curves	nch?
<ul> <li>18. What is the main purpose of the "Draft Analysis" tool in CATIA's Part Design workbench?</li> <li>a) To analyze the thermal properties of a part</li> <li>b) To check for undercuts and proper mold release in a design</li> <li>c) To create drafts on a part's edges</li> <li>d) To perform stress analysis on a part</li> </ul>	[b] V
<ul> <li>19. Which workbench in CATIA allows you to create parametric models by combining multiple solid and surface features?</li> <li>a) Part Design</li> <li>b) Assembly Design</li> <li>c) Generative Shape Design</li> <li>d) Wireframe and Surface Design</li> </ul>	
<ul> <li>20. What is the primary purpose of the "Human Builder" tool in CATIA?</li> <li>a) To create parametric models of humans for ergonomic studies</li> <li>b) To design clothing and accessories</li> <li>c) To simulate human-like movements in an assembly</li> <li>d) To analyze the human body's thermal properties</li> </ul>	[6]×

## About CATIA

- CATIA is developed by DASSAULT system and IBM
- Its programming is written in c++ language

## WORK BENCH

There are various workbench in CATIA such as:

part design

Assembly design

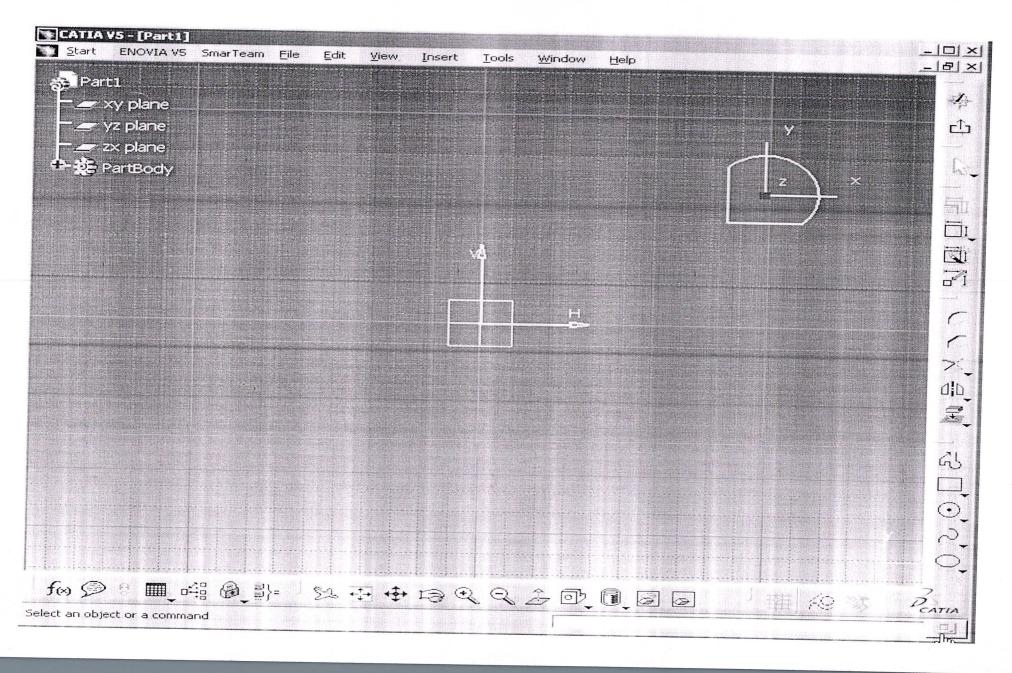
Drafting

Sheet metal design

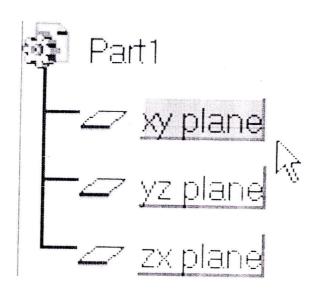
Wireframe drawing

DMU kinematics

## sketcher

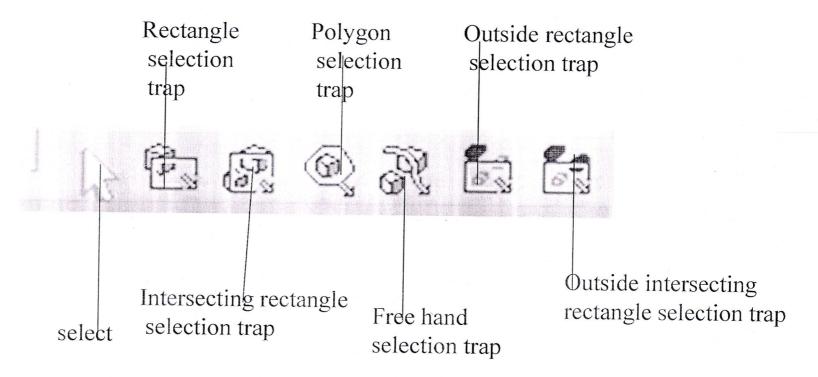


## **Specification tree**



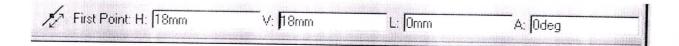
## Select toolbar

## There are various type of select toolbar

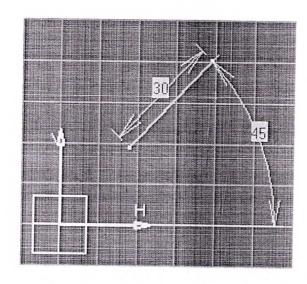


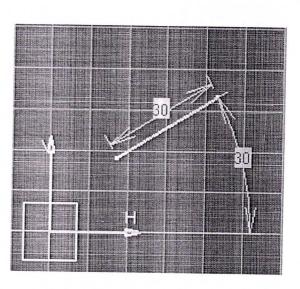


line

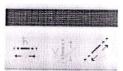


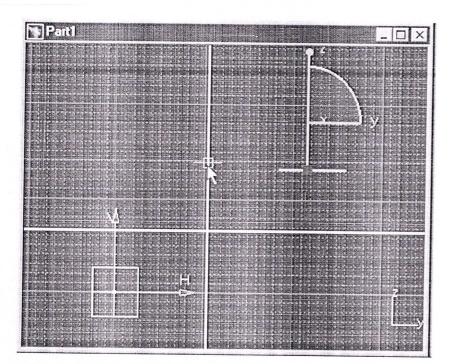
Second Point: H: 47.783mm V: 18.897mm L: 30mm A: 45deg

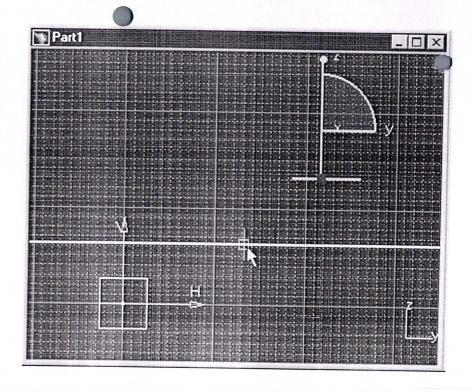


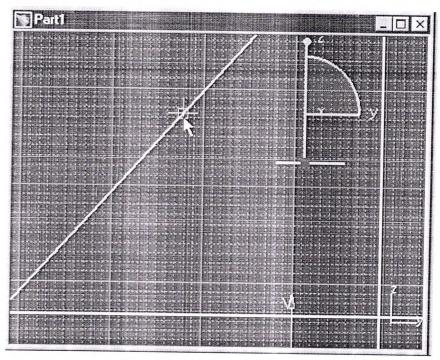


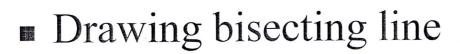
#### ■ Infinite line

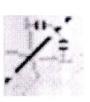


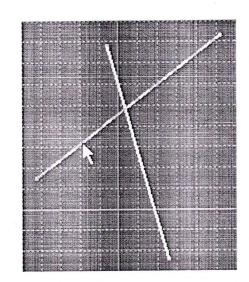


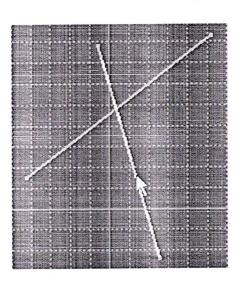


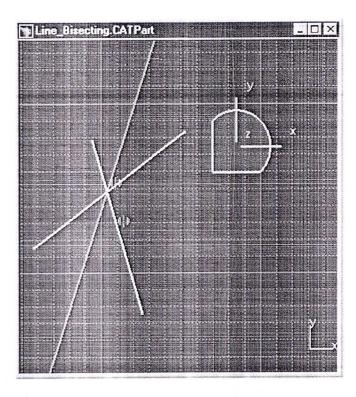












Drawing bi-tangent line

