Revised Academic Calendar of EVEN semesters of UG Programmes for 2020-2021

Semesters / EVENTS	IV semester B.E./B.Tech.	IV semester B.Arch./ B.Plan.	VI semester B.E./B.Tech.	VI semester B.Plan./B.Arch	VIII semester B.E./B.Tech.	VIII semester B.Plan.	VIII semester B.Arch
Commencement of EVEN Semester	19.04.2021	19.04.2021	19.04.2021	19.04.2021	19.04.2021	19.04.2021	19.04.2021
Last Working day of EVEN Semester	07.08.2021	07.08.2021	07.08.2021	07.08.2021	#20.07.2021	#20.07.2021	07.08.2021
Practical Examinations	09.08.2021 To 19.08.2021	09.08.2021 To 19.08.2021	09.08.2021 To 19.08.2021	—	—	—	—
Theory Examinations	23.08.2021 To 09.09.2021	23.08.2021 To 09.09.2021	23.08.2021 To 09.09.2021	10.08.2021 To 31.08.2021	22.07.2021 To 30.07.2021	22.07.2021 To 30.07.2021	10.08.2021 To 17.08.2021
Internship	—	—	—	—	—	—	—
Internship Viva-Voce/ Project Viva-Voce	—	—	—	—	02.08.2021 To 06.08.2021	—	—
Professional training / Organization study	—	—	—	—	—	—	—
Commencement of ODD Semester	13.09.2021	13.09.2021	13.09.2021	13.09.2021	—	—	23.08.2021

- The classroom sessions for even the semester should commence from the dates mentioned above.
- The Institute needs to function for six days a week with additional hours (Saturday is a full working day). #if required the college can plan to have extra classes even on Sundays also.
- If any of the above dates are declared to be a holiday then the corresponding event will come into effect on the next working day.
- Notification regarding the Calendar of Events relating to the conduct of **University Examinations** will be issued by the Registrar (Evaluation) from time to time.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Academic Calendar may be modified based on guidelines/directions issued in the future by MHRD/UGC/AICTE/State Government.
- Revised Academic Calendar is also applicable for **Autonomous Colleges**. In case if any changes are to be affected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.

21.04.2021

REGISTRAR

S. J. C INSTITUTE OF TECHNOLOGY, CHICKBALLAPUR

DEPARTMENT OF AERONAUTICAL ENGINEERING

VISION:

DEVELOPE THE DEPARTMENT AS A CENTER OF EXCELLENCE TO EVOLVE AERONAUTICAL ENGINEERS WITH KNOWLEDGE, SKILL AND CHARACTER FOR ALL RELEVANT OCCUPATIONS.

MISSION:

M1 - TO BUILD A TALENT POOL OF AERONAUTICAL ENGINEERS WITH INNOVATIVE PROBLEM SOLVING CAPABILITIES

M2 - TO GROOM AERONAUTICAL ENGINEERS TO BE RESPONSIBLE CITIZENS WITH SENSITIVITY TO ETHICAL, SOCIETAL AND ENVIRONMENTAL ISSUES

M3- ORIENTATION OF THE STUDENTS TO STATE-OF-THE-ART TECHNOLOGIES AND RESEARCH FOR AEROSPACE PRODUCT DEVELOPMENT ACTIVITIES

IIJAI SRI GURUDEVII

CALENDAR(EVENTS FOR THE ACADEMIC YEAR 2020-2021 (EN SEMESTER) FOR B E, MBA & M.Tech

Accredited by NBA (ME,ECE & CSE) & NAAC QS I Gauge (GOLD Rating)

VISION

SJCIT is Committed to Quality Education, Training and Research

Week No.	Month	Week Days							No. of Working Days	Events
		Mon	Tue	Wed	Thu	Fri	Sat	Sun		
1.	April	19	20	21	22	23	24		6	April 19th - Registration and commencement of IV, VI & VIII Sem BE Classes April 21st - HOD's Meeting, April 24th – Seminar for I Sem, April 25th – Sri Mahavir Jayanthi
2.	April/May	26	27	28	29	30			5	May 1st – Alumni Meet, May Day
3.	May	3	4	5	6	7	8		6	May 8th – Seminar for I Sem, May 5th – HOD's Meeting, 3rd May to 8th May – AICTE Activity Point Prog
4.	May	10	11	12	13				4	May 10th – Submission of CIE I Attendance, May 10th to 13th – Tutorials I May 14th – Basava Jayanthi & Ramzan, May 13th May 2021 – Base Camp @ AMPHI theatre
5.	May	17	18	19	20				6	May 19th - Registration and commencement of II Semester BE Classes May 21st, 22nd & 24th – CIE I for IV, VI & VIII Sem
6.	May		25	26	27	28	29		6	May 24th, 25th & 26th – Project Phase II Review I, May 29th – Seminar for II Semester May 29th – Submission of CIE I Marks of IV, VI & VIII Semester
7.	May/June	31	1	2	3	4			5	June 2nd – HOD's Meeting, June 4th – Parents Meet, Class Teacher and Proctor Meet
8.	June	7	8	9	10	11	12		6	June 12th – Seminar for I Sem; June 7th, 8th & 9th – Internship Review (Internal)
9.	June	14	15	16	17				5	June 14th – Submission of CIE II Attendance, June 14th to 17th – Tutorials II June 18th, 21st & 22nd – CIE II for IV, VI & VIII Sem BE and for II Semester B E - CIE I
10.	June			23	24	25	26		6	25th – Base Camp @ AMPHI theatre, June 26th – Seminar for II Sem 26th – Submission of CIE II Marks of IV, VI & VIII Sem & CIE I marks of II Sem BE
11.	June/July	28	29	30	1	2			5	June 28th, 29th & 30th – Project Phase II Review II
12.	July	5	6	7	8	9	10		6	July 7th – HOD's Meeting, July 10th – Seminar for I Sem
13.	July	12	13	14	15	16			5	July 12th – Submission of CIE III Attendance, July 12th to 15th – Tutorials III
14.	July	19					24		5	July 20th, 22nd & 23rd – CIE III for IV, VI & VIII Sem BE and CIE II for II Semester BE July 21st – Bakrid, July 23rd – Base Camp @ AMPHI theatre, July 24th – Seminar for II Sem
15.	July/Aug	26	27	28	29	30	31		6	June 30th - Submission of CIE III marks of IV, VI & VIII Sem BE & CIE II marks of II Sem BE
16.	Aug	2	3	4	5	6			5	Aug 2nd, 3rd & 4th –Laboratory Internals for IV & VI sem , Aug 6th - Finalization of CIE marks
17.	Aug	9	10	11	12	13	14		6	Aug 15th – Independence Day
18.	Aug	16	17						4	Aug 17th, 18th & 20th - CIE III for II Sem BE; Aug 19th - Moharam
19.	Aug		24	25	26	27	28		6	Aug 29th – Krishna Janmastami, Aug 28th - Submission of CIE III marks of II Sem BE
20.	Aug/ Sep	30	31	1	2	3			5	Aug 30th, 31st & 1st – Laboratory Internsals for II Sem
21.	Sep	6	7	8	9	10	11		6	Finalization of Internal Marks of All Semester of BE

Commencement of Even Semester Classes for BE 4th, 6th & 8th Semester is 19th April 2021; for II Semester : 19th May 2021

MISSION

- Augmenting the supply of Competent Engineers and Managers
- Building Engineers and managers with Value, Vision and Versatility
- Developing and Disseminating New Knowledge and Insights

Dr. R. Ranganatha
Academic In-charge

Dr. G. T. Raju
Principal

SJCIT

SJC Institute of Technology, Chickballapur

(VTU Affiliated, AICTE approved, Accredited by NAAC)

Department of Aeronautical Engineering

Time Table

Year: April - 2021
Room No: ALH-201

W.E.F: 19.04.2021
Semester & Section : IV - A

Day / Time	9:00 - 10:00	10:00 - 10:50	10:50 - 11:00	11:00 - 11:50	11:50 - 12:40	12:40 - 1:30	1:30 - 2:20	2:20 - 3:10	3:10 - 4:00	4:00 - 4:10	4:10 - 5:00
Monday	AMS	MAT-IV		MMT	TM		MATERIAL TESTING LAB (B1) -MPS CAAD LAB (B2)-RLG			BREAK	AMS
Tuesday	AD-I	MMT		ACP	MAT-IV		AD-I	HR	TM		AD-I
Wednesday	ACP	TM		ACP	DIP MAT-IV		MAT-IV	MMT	Kannada (Ramu)		ACP
Thursday	TM	AD-I		AD-I	Proctor		AMS	HR	MAT-IV		TM
Friday	AMS	ACP		MMT	CAAD		MATERIAL TESTING LAB (B2)- MPS CAAD LAB (B1) - RLG				MAT-IV
Saturday	MMT	ACP		MAT-IV	DIP MAT-IV		TM	AMS	Aero modeling lab		

Subject Code	Subject Name	Staff Name	
18MAT 41	ENGINEERING MATHEMATICS-IV (MAT-IV)	Prof. Sudhakar .P (SP)	**Class Teacher:**
18AE42	AERODYNAMICS –I (AD-I)	Dr. Munikrishna .N / Dr. Nikhil Vijay	Prof. Deepa MS
18AE43	AIRCRAFT PROPULSION (ACP)	Prof. Deepa M.S (DMS)	
18AE44	MECHANISMS AND MACHINE THEORY (MMT)	Prof. Mithun P.S (MPS)	**Proctor:**
18AE45	AIRCRAFT MATERIAL SCIENCE (AMS)	Prof. Vinay .P (VP)	(1SJ19AE001 TO 1SJ19AE025, 045, 047) = 24 Dr. Bino Prince Raja .D
18AE46	TURBOMACHINES (TM)	Prof. Rohith L.G (RLG)	
18AEL47A	MATERIAL TESTING LAB	Prof. Mithun P.S (MPS)-B1,B2	(1SJ19AE027 TO 1SJ19AE044, 1SJ18AE010, 020, 063, KEERTHAN KUMAR .N) = 22 Prof. Deepa MS
18AEL48	COMPUTER AIDED AIRCRAFT DRAWING (CAAD)	Prof. Rohith L.G (RLG) B1,B2	
18KVK49	VYAVAHARIKA KANNADA (KANNADA FOR COMMUNICATION)	Prof. Deepa MS	
18KAK49	AADALITHA KANNADA (KANNADA FOR ADMINISTRATION)	Prof. Ramu	

4/3/21
CTO

CTO

PROFESSOR & HOD
Department of Aeronautical Engineering

PRINCIPAL

B.E AERONAUTICAL ENGINEERING
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)
SEMESTER - IV

Aircraft Material Science

Course Code	**18AE45**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

- Acquire knowledge on aircraft materials- metallic and non-metallic
- Understand the properties of super alloys, ablative materials and high energy material.
- Study material corrosion and prevention

Module-1

Introduction to Aircraft Materials
General properties of materials, Definition of terms, Requirements of aircraft materials, Testing of aircraft materials, Inspection methods, Application and trends in usage in aircraft structures and engines, Selection of materials for use in aircraft.

Aircraft Metal Alloys
Aluminum alloys, Magnesium alloys, Titanium alloys, Plain carbon and Low carbon Steels, Corrosion and Heat resistant steels, Maraging steels, Copper alloys, Producibility and Surface treatments aspects for each of the above;

Module-2

Super Alloys
General introduction to super alloys, Nickel based super alloys, Cobalt based super alloys, and Iron based super alloys, manufacturing processes associated with super alloys, Heat treatment and surface treatment of super alloys.

Composite Materials: Definition and comparison of composites with conventional monolithic materials, Reinforcing fibers and Matrix materials, Fabrication of composites and quality control aspects, Carbon-Carbon Composites production, properties and applications, inter metallic matrix composites, ablative composites based on polymers, ceramic matrix, metal matrix composites based on aluminum, magnesium, titanium and nickel based composites for engines.

Module-3

Polymers, Polymeric Materials & Plastics and Ceramics & Glass
Knowledge and identification of physical characteristics of commonly used polymeric material: plastics and its categories, properties and applications; commonly used ceramic, glass and transparent plastics, properties and applications, adhesives and sealants and their applications in aircraft.

Module-4

Ablative Materials
Ablation process, ablative materials and applications in aerospace.

Aircraft Wood, Rubber, Fabrics & Dope and Paint: Classification and properties of wood, Seasoning of wood, Aircraft woods, their properties and applications, Joining processes for wood, Plywood; Characteristics and definition of terminologies pertaining to aircraft fabrics and their applications, Purpose of doping and commonly used dopes; Purpose of painting, Types of aircraft paints, Aircraft painting process.

Module-5

Corrosion and its Prevention
Knowledge of the various methods used for removal of corrosion from common aircraft metals and methods employed to prevent corrosion.

High Energy Materials: Materials for rockets and missiles. Types of propellants and its general and desirable properties, insulating materials for cryogenic engines. Types of solid propellants: Mechanical characterization of solid propellants using uni-axial, strip-biaxial and tubular tests.

Course Outcomes: At the end of the course the student will be able to:

1. CO1: Identify appropriate aircraft materials for a given application.
2. CO2: Explain the properties of super alloys, ablative materials and high energy material.
3. CO3: Understand material corrosion process and apply prevention technique.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl. No.	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	Aircraft Material and Processes	**Titterton G F**	English Book Store, New Delhi	1998
2	Advanced Aerospace Material	**H Buhl**	Spring Berlin	1992
Reference Books				
1	Handbook of Aircraft materials	**C G Krishnadas**	Interline publishers, Bangalore	1993
2	Aerospace material	**Balram Gupta, S**	Vol. 1,2,3 ARDB, Chand & Co	1996
3	Materials for Missiles and Space	**Parker E R**	John Wiley, McGraw-Hill	1963
4	Materials of Aircraft Construction	**Hill E T**	Pitman London	

29/4/21.

PROFESSOR & HEAD
Department of Aeronautical Engineering
S.J.C. Institute of Technology
CHICKBALLAPUR-562101

|| Jai Sri Gurudev ||
Sri Adichunchanagiri Shikshana Trust ®

SJC INSTITUTE OF TECHNOLOGY

Chickballapur – 562 101

Estd: 1986

Department Of Aeronautical Engineering

LESSON PLAN

SUBJECT TITLE	AIRCRFAT MATERIAL SCIENCE		
SUBJECT TYPE	CORE		
SUBJECT CODE	18AE45		
ACADEMIC YEAR	2021 (EVEN SEMESTER)	BATCH	2021-2021
SCHEME	CBCS scheme (Effective from the academic year 2016 -2017)		
SEMESTER & SECTION	4TH Sem		
IA MARKS	40	EXAM MARKS	60
NUMBER OF LECTURE HOURs/WEEK	03	TOTAL NUMBER OF LECTURE HOURS	40
FACULTY NAME	VINAY P	NO. OF TIMES HANDLED	4

COURSE LEARNING OBJECTIVES: This course will enable students to

1. Acquire Knowledge on aircraft materials-metallic and non-matallic
2. Understand the properties of super alloys, ablative materials and high energy materail
3. Study material corrosion and prevention

COURSE OUTCOMES: At the end of this course, students are able to:

CO1	Summarize the properties, inspection methods and testing of aircraft metallic and non-metallic materials.(L-2)
CO2	Describe the properties of super alloys, ablative, composite materials and high energy materials.(L-2)
CO3	Illustrate corrosion and its prevention methods used for material.(L-2)

CO-PO MATRIX

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	2	-	3
CO2	3	-	-	-	-	-	-	-	-	-	-	2	-	3
CO3	3	-	-	-	-	-	-	-	-	-	-	2	-	3

DELIVERY PLAN WITH DETAILS

MODULE – 1

Lecture #	Topic	Mode of Delivery (PlsTick √)				Date of Delivery	COs Covered
		1	2	3	4		
1	Introduction to Aircraft Materials, General properties of materials		√			22/4/21	CO1
2	Definition of terms, Requirements of aircraft materials		√			26/4/21	CO1
3	Testing of aircraft materials, Inspection methods		√			28/4/21	CO1
4	Application and trends in usage in aircraft structures, engines		√			29/4/21	CO1
5	Selection of materials for use in aircraft, Aluminum alloys		√			3/5/21	CO1
6	Magnesium alloys, Titanium alloys, Plain carbon and Low carbon Steels		√			5,6/5/21	CO1
7	Corrosion and Heat resistant steels, Maraging steels, Copper alloys		√			10/5/21	CO1
8	Producibility and Surface treatments aspects		√			12/5/21	CO1

Textbook : and chapter :

Signatures	Faculty: 7/7/21	#HOURS	Allotted	Taken
	HoD: 7/7/21		07	08
Remarks				

MODULE – 2

Lecture #	Topic	Mode of Delivery (PlsTick √)				Date of Delivery	COs Covered
		1	2	3	4		
10	Super Alloys, General introduction to super alloys		√			13/5/21	CO2
11	Nickel based super alloys, Cobalt based super alloys		√			17/5/21	CO2
12	Manufacturing processes associated with super alloys, Heat treatment of super alloys		√			19/5/21	CO2
13	surface treatment of super alloys		√			19/5/21	CO2
14	Composite Materials: Definition and comparison of composites with conventional monolithic materials,		√			20/5/21	CO2
15	Reinforcing fibers and Matrix materials, Fabrication of composites and quality control aspects		√			24/5/21	CO2
16	Carbon-Carbon Composites production, properties and applications		√			26/5/21	CO2
17	Inter metallic matrix composites, ablative composites based on polymers		√			2/6/21	CO2

18	Ceramic matrix, metal matrix composites based on aluminum, magnesium		√			3/6/21	CO2
19	metal matrix composites based on titanium and nickel based composites for engines.		√			3/6/21	CO2

Textbook : and chapter:

Signatures	**Faculty:** 7/7/21	**#HOURS**	**√**	**Taken**
	HoD: 7/7/21.		09	08
Remarks				

MODULE – 3

Lecture #	Topic	Mode of Delivery (PlsTick √)				Date of Delivery	COs Covered
		1	2	3	4		
20	Polymers , Polymeric Materials		√			7/6/21	CO1
21	Knowledge and identification of physical characteristics of polymeric material,		√			9/6/21	CO1
22	Plastics and its categories		√			9/6/21	CO1
23	Properties and applications of plastics, commonly used ceramic		√			9/6/21	CO1
24	Properties and applications of glass and transparent plastics		√			14/6/21	CO1
25	Adhesives and sealants applications in aircraft		√			17/6/21	CO1

Textbook : and chapter :

Signatures	**Faculty:** 7/7/21	**#HOURS**	**√**	**Taken**
	HoD:0 7/7/21		07	04
Remarks				

MODULE – 4

Lecture #	Topic	Mode of Delivery (PlsTick √)				Date of Delivery	COs Covered
		1	2	3	4		
26	Ablative Materials, Ablation process, applications in aerospace		√			23/6/21	CO2
27	Classification and properties of wood, Seasoning of wood		√			24/6/21	CO1
28	Aircraft woods properties and applications		√			24/6/21	CO1
29	Joining processes for wood , Plywood		√			5/7/21	CO1
30	Characteristics and definition of terminologies to aircraft					7/7/21	CO1

(*Note:* Mode of Delivery : 1:Black Board 2:PPT 3:Video 4:Demo/Hands-on)

INTERNAL/ASSIGNMENT/QUIZ SCHEDULE

TEST and QUIZ		COs and Portions Covered		ASSIGNMENT	
Test# and Quiz#	DATE	CO	Modules	Assignment#	DATE
T1 & Q1	29/5/21	CO1 & CO2	1 & 2	A1	23/06/2021
T2 & Q2	30/6/21	CO1 & CO2	2 & 3	A2	24/07/2021
T3 & Q3	06/8/21	CO3, CO2, CO1	4 & 5	A3	30/08/2021

SUMMARY

Signatures With Date	Faculty: 6/8/21	Total #HOURS	Allotted	Taken
	HoD: 6/8/21		40	34
Remarks				

ENCLOSURES

1. Syllabus
2. CO Attainment
3. Gap Analysis
4. Special lectures/talks arranged if any

Feedback by PAC

19/8/21

Faculty **Course coordinator** **PAC** **HOD**

31/8/21

PROFESSOR & HEAD
Department of Aeronautical Engineering
S.J.C. Institute of Technology
CHICKBALLAPUR-562101

||JAI SRI GURUDEV||
SJC INSTITUTE OF TECNOLOGY
DEPARTMENT OF AERONAUTICAL ENGINEERING

Subject: Aircraft Material Science
Code: 18AE45

TUTORIAL-1

Question No.		CO	Levels
1	Explain the general properties of materials.	CO1	L2
2	List and Explain the types of testing used for aircraft materials	CO1	L2
3	Explain the inspection methods used for aircraft materials	CO1	L2
4	Explain the desirable properties required for aircraft materials.	CO1	L2
5	Explain trends in usage of materials in aircraft structure with neat sketch	CO1	L2
6	Explain production methods and surface treatment of the following: i.Aluminum Alloy ii. Titanium Alloy iii. Magnesium Alloy	CO1	L2
7	Explain the importance and applications of Titanium alloys	CO1	L2
8	Explain trends in usage of materials in aircraft Engine with neat sketch	CO1	L2
9	Explain the importance and applications of Aluminum alloys	CO1	L2
10	Define the following a.Normalizing b.Quenching c.Carburizing d. Hardening	CO1	L1
11	Explain how yield strength of a material can be determined	CO1	L2
12	Explain the types of corrosion that commonly occurs in Aluminum alloys.	CO1	L2
13	Explain the importance and applications of Magnesium alloys	CO1	L2
14	Discuss the different types of corrosion prevention for magnesium	CO1	L2
15	Explain copper and its alloys	CO1	
16	Explain the working properties of Corrosion resisting steel	CO1	L2
17	Write a note on Super alloys	CO2	L2
18	Explain the properties and applications of Nickel based super alloy.	CO2	L2
19	Explain the properties and applications Coblat based super alloy.	CO2	L2
20	Explain production methods following: i.Nickel based super alloy ii.Cobalt based super alloy	CO2	L2

29/6/21

29/6/21.

PROFESSOR & HEAD

||Jai Sri Gurudev ||

S.J.C. Institute of Technology, Chickballapur

Department of Aeronautical Engineering

ASSIGNMENT → 1

Subject: Aircraft Material Science

Subject Code: 18AE45

1. Briefly explain the functions of the aircraft parts. And also mention the materials commonly used for different parts of aircrafts by the various aircraft manufactures.(10marks)

Parts should include from following sections:

- Structural Parts
- Engine Parts
- Non-Structural Parts

Write it in A4 unruled sheets

Marks Distribution:

A	All the relevant information is obtained and information source is valid	5
B	Explanation with sketches	3
C	Neatness	2

29/6/21

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Sri Adichunchanagiri Shikshana Trust ®

SJC INSTITUTE OF TECHNOLOGY

Estd: 1986

Chickballapur – 562 101

Department of Aeronautical Engineering

QUESTION BANK

SUBJECT TITLE	AIRCRFAT MATERIAL SCIENCE		
SUBJECT TYPE	CORE		
SUBJECT CODE	18AE45		
ACADEMIC YEAR	2021	BATCH	2019
SCHEME	2018		
SEMESTER	4TH SEM		
FACULTY NAME and DESIGNATION	VINAY P Assistant Professor		

Module -1			
Q. No.	*Questions*	*Bloom's LL*	*COs*
1	Explain the general properties of materials.	L1	CO1
2	List and Explain the types of testing used for aircraft materials	L1	CO1
3	Explain the inspection methods used for aircraft materials	L1	CO1
4	Explain the desirable properties required for aircraft materials.	L2	CO1
5	Explain trends in usage of materials in aircraft structure with neat sketch	L2	CO1
6	Explain production methods and surface treatment of the following: i.Aluminum Alloy ii. Titanium Alloy iii. Magnesium Alloy	L2	CO1
7	Explain the importance and applications of Titanium alloys	L2	CO1
8	Explain trends in usage of materials in aircraft Engine with neat sketch	L2	CO1
9	Explain the importance and applications of Aluminum alloys	L2	CO1
10	Define the following a.Normalizing b.Quenching c.Carburizing d. Hardening	L1	CO1
11	Explain how yield strength of a material can be determined	L2	CO1
12	Explain the types of corrosion that commonly occurs in Aluminum alloys.	L2	CO1

13	Explain the importance and applications of Magnesium alloys	L2	CO1
14	Discuss the different types of corrosion prevention for magnesium	L2	CO1
15	Explain copper and its alloys	L2	CO1
16	Explain the working properties of Corrosion resisting steel	L2	CO1

Module -2			
Q. No.	*Questions*	*Bloom's LL*	*COs*
1	Write a note on Super alloys	L1	CO2
2	Explain the properties and applications of Nickel based super alloy.	L1	CO2
3	Explain the properties and applications Coblat based super alloy.	L1	CO2
4	Explain production methods following: i.Nickel based super alloy ii.Cobalt based super alloy	L2	CO2
5	List the classification of composite based on matrix material. Explain each.	L2	CO2
6	List the classification of composite based on reinforcement material. Explain each.	L2	CO2
7	Describe the different types of fibers used in composite materials	L2	CO2
8	Explain the different types of polymer matrix materials used in composite materials	L2	CO2
9	Illustrate the different types of metal matrix materials used in composite materials	L2	CO2
10	Describe hand layup method for manufacturing of polymer matrix composite materials	L2	CO2
11	Explain autoclave curing process with neat sketch	L2	CO2
12	Illustrate pultrusion process with neat sketch	L2	CO2
13	Explain vacuum bag moulding process with neat sketch	L2	CO2
14	Illustrate stir casting process with neat sketch	L2	CO2
15	Describe powder metallurgy process with neat sketch	L2	CO2
16	Distinguish between composites and monolithic materials.	L2	CO2
17	List the applications of composites in aeronautical field and mention the material names.	L2	CO2

Module -3			
Q. No.	Questions	Bloom's LL	COs
1	Explain the classification of polymer materials	L2	CO1
2	List the characteristics, advantages, disadvantages and applications of plastic materials.	L2	CO1
3	Explain the different thermoplastic and thermosetting plastic materials	L2	CO1
4	Discuss Non-scatterable glass.	L2	CO1
5	Explain the different types of test for Non-scatterable glass.	L2	CO1
6	List the properties and applications of glass	L2	CO1
7	Express the different types of transparent plastics used in aircraft	L2	CO1
8	Define Adhesives and sealant. Explain their characteristics, advantages, disadvantages and applications.	L2	CO1
9	Illustrate different structural adhesives used in aircrafts	L2	CO1

Module -4			
Q. No.	Questions	Bloom's LL	COs
1	Define Ablative materials and explain the process of ablation.	L2	CO2
2	Discuss the classification of ablative materials.	L2	CO2
3	Explain the factors affecting heating conditions of ablative materials	L2	CO2
4	Describe the properties of wood.	L2	CO1
5	List the applications of ablative materials in aircrafts	L1	CO1
6	List and explain the different aircraft wood .	L1	CO1
7	List the applications of wood materials in aircrafts	L2	CO1
8	Discuss the factors affecting the strength of wood.	L2	CO1
9	Explain the aircraft wood joining process.	L2	CO1
10	Illustrate seasoning of wood. Explain the types of seasoning of wood.	L2	CO1
11	Explain aircraft fabric covering.	L2	CO1
12	What are dopes? Explain the properties and functions of dopes	L2	CO1
13	Explain the purpose of painting and types of aircraft paintings.	L2	CO1
14	Explain the process of painting.	L2	CO1

Module -5			
Q. No.	**Questions**	**Bloom's LL**	**COs**
1	Describe the following: • Chromatizing • Chromium Plating • Metal.Spraying • Parkerizing • Bonderizing • Sherardizing • Galvanizing (Zinc Plating) Cadmium Plating.	L1	CO3
2	Explain the operation of alodizing process.	L1	CO3
3	Describe the following: • Chrome Pickle treatment • Sealed chrome pickle • Galvanic Anodizing Treatment Dichromate treatment	L1	CO3
4	List and explain the materials used for rockets and missile.	L2	CO3
5	Explain different types of propellants used in Rockets	L2	CO3

29/6/21

29/6/21

PROFESSOR & HEAD
Department of Aeronautical Engineering
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Internal Test Question paper

Name of the staff/s: VINAY P

Date: 29/05/2021 Signature:

Reviewer's Signature: 28/6/2021

S.J.C. Institute of Technology
Department of Aeronautical Engineering
Test: I
Semester: IV
Subject Name & Code: Aircraft Material Science(18AE45)
Test Date: 29/05/2021 **Academic Year: 2021 Even sem**

Instructions

Duration: 90 Minutes **Max Marks: 50**

NOTE: Answer all Five main questions, choosing one full question from each main

Question Number		Marks	CO	Levels
1	List and Explain the types of testing used for aircraft materials	10	CO1	L2
	OR			
2	List and Explain the inspection methods used for aircraft materials	10	CO1	L2
3	Explain trends in usage of materials in aircraft structure and engine with neat sketch	10	CO1	L2
	OR			
4	Explain the desirable properties required for aircraft materials.	10	CO1	L2
5	Explain the types of corrosion that commonly occurs in Aluminum alloys.	10	CO1	L2
	OR			
6	Discuss the different types of corrosion prevention methods	10	CO1	L2
7	Explain the following a.Normalizing b.Quenching c.Carburizing d. Hardening e. Annealing	10	CO1	L2
	OR			
8	Explain the properties and applications of Aluminum and magnesium alloys	10	CO1	L2
9	Explain the properties and applications of Nickel and cobalt based super alloy.	10	CO2	L2

DEPARTMENT: AERONAUTICAL ENGINEERING

Scheme & Solutions- TEST- I/~~II/III~~ **Date:** 02/7/21

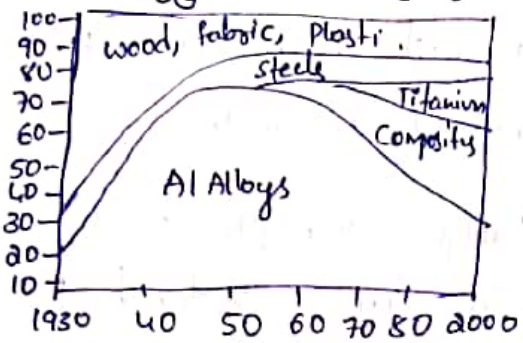
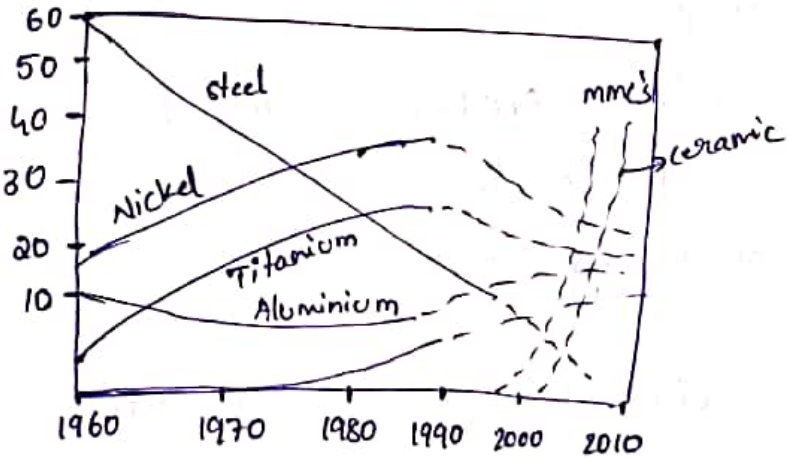
Semester: 4th Sem **Subject Title:** Aircraft Material Science **Subject Code:** 18AEL45

Question Number	Solution	Marks Allocated
1.	a. Tension Test:- It is the most valuable test that can be made to obtain the basic properties of a material.	1 1
	b. Hardness Test:- This method depends upon the impression made in the tested metal by a diamond cone or hardened ball.	1 1
	c. Bending Test:- The usual test requires cold bending through an angle of 180°, over a pin equal to the diameter of the test specimen without cracking.	1 1
	d. Impact Test:- Consists of notching a piece of material on one side and then fixing it in a machine so that it can be broken by means of a falling weight.	1 1
	e. Crushing Test:- Aircraft tubing is nearly always subjected to a crushing test. For this test a piece of tubing 11/2 diameters long with its ends machined normal to its axis is used.	1 1 10

Subject Title: Aircraft Material Science **Subject Code:** 18AE63

Question Number	Solution	Marks Allocated
2.	a. Visual Inspection:- It is particularly effective detecting macroscopic flaws such as poor welds, crater cracking, undercutting.	1 1
	b. Radiography:- It has an advantage over some of the other processes in that the radiography provides a permanent reference.	1 1
	c. Liquid Dye Penetrant:- Is one of the most widely used NDT evaluation methods. The technique is based on the ability of a liquid to be drawn into a clean surface.	1 1
	d. Magnetic Particles:- Is one of the simple, fast and traditional NDT methods widely used because of its convenience & low cost.	1 1
	e. Eddy current Test:- This are created through a process called electromagnetic Induction. when alternating current is applied to the conductor, a magnetic field develops in and around conductor.	1 1
		10

Subject Title: Aircraft Material science **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
3.	Trends in usage in Aircraft structure :-  Trends in the use of major materials as a percent of total airframe weight. Even though Al alloys still comprise the major group its use is one the decline.	1 1 1 1 1
	Trends in usage in Aircraft Engine:-  * The use of composites both resin based and ceramic or MMC's are likely to increase in place of reduced usage of conventional materials such as steel, titanium & aluminium	1 1 1 1 1 10

Subject Code: 18AE46

Subject Title: Aircraft Material Science

Question Number	Solution	Marks Allocated
4.	a. Strength & Rigidity:- Static structural efficiency which takes into account both strength and density is an important parameter.	1 1
	b. Fatigue strength:- Fatigue strength is the highest stress that a material can withstand for a given number of cycles without breaking.	1 1
	c. Toughness and Rate of crack propagation:- The material should be sufficiently tough to resist formation of cracks. Once a crack is formed, the rate of propagation should be slow enough.	1 1
	d. Stress corrosion:- Another source of failure of aircraft materials is stress corrosion which is failure by cracking due to combined action.	1 1
	e. Simulated service Test:- The aircraft and the materials used for its construction are subjected to rapid & gradual changes in climatic conditions.	1 1 10

Subject Title: Aircraft Material Science **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
5.	Environmental corrosion:- Pure aluminium is very resistant to atmospheric corrosion but when alloying element added, resistance decreases.	1 1 1
	Sea water corrosion:- 5052Al is more corrosion than 1100Al but not atmospheric corrosion. A good protective coating is important.	1 1
	Pitting:- Pitting corrosion is analogous to the rusting of iron. This eating away of the surface is accelerated in the presence of moisture.	1 1
	Intercrystalline corrosion:- This type of corrosion occurs most often in parts of the structure that are poorly ventilated and inaccessible corners of internal joints.	1 1 1 10
6.	Anodizing:-	
	The standard electrolyte used in the anodic oxidation process is a solution of chromic acid in water. The chromic acid content varies from 5% to 10% in	1 1

Subject Title: Aircraft Material Science **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
	different baths. The chromic acid must be at least 99.5% pure and its limited in its sulphate and chloride content.	1
	Potassium Dichromating:-	
	Potassium dichromate is an excellent inhibitor of corrosion of aluminium alloys when anodised, the interior of fuel tanks is not well coated with anodised film & is frequently protected by this way.	1 1 1
	Chromatizing:-	
	This is a dip process which uses the same chromic acid bath as anodizing but without electric current. In chromatizing the work should be immersed for 5 minutes in a chromic acid bath at a temp of 120°F.	1 1 1 1
		10

Subject Title: Aircraft Material Science **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
7.	a. Normalizing :- It involves heating material above its re-crystalization temp. and soaking it for a short period of time.	1 1
	b. Quenching :- Is the immersion of the heated metal in a liquid, usually either oil or water to accelerate its cooling.	1 1
	c. Carburizing :- Is the addition of carbon to steel by heating it at a high temperature while in contact with a carbonaceous material.	1 1
	d. Hardening.- Is done by heating the metal to a temperature above the critical range and then quenching it.	1 1
	e. Annealing :- Is the process of heating the material above the re-crystalization or critical temp holding it at that temp until it is uniformly heated.	1 1 10
8.	Properties of Aluminium :-	
	* Light weight	1
	* Good electrical & Heat conductivity	1
	* Good corrosion resistance.	1
	* Moderate cost.	

Subject Title: Aircraft Material Science **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
	Application of Aluminium:-	
	* ~~as~~ structural part	1
	* Cowling, fairings, tanks, electrical conduits.	
	* 1100-H 14 tubing for electrical conduit.	1
	* Tubing for fuel & oils	
	Properties of Magnesium alloys:-	
	* Magnesium is the lightest of the structural metals available for aircraft contruction.	1
	* Good mechanical properties	1
	* Rose Mg is good corrosion resistance.	1
	Application of Magnesium:-	
	* Wings, Spars, ribs,	1
	* Tubing, tanks	1
		10
9.	Nickel Base Superalloy:-	
	Is the most used material in turbine engines because of its high strength and long fatigue life combined with good resistance to oxidation and corrosion.	1 1 1 1

Subject Title: Aircraft Material Science **Subject Cod** 18AE45

Question Number	Solution	
	Nickel-based superalloy is the material of choice for the hottest engine components.	1
	Cobalt superalloys:-	
	Cobalt superalloys possess several properties which make them useful materials for gas turbine engines, although they are more expensive than nickel superalloys. Cobalt alloys generally have better hot-corrosion resistance than nickel-based.	1 1 1 1 1
		10
10.	Casting of super alloys:-	
	Casting of super alloys is done by investment casting under vacuum. of late, majority of the turbine wheels and stators for gas turbine applications.	1 1 1
	Forging of superalloys:-	
	Forging of superalloys is usually carried out using hammers or quick acting presses. Electrically heated furnaces are preferred for heating the forging stock.	1 1 1

Subject Title: Aircraft material science **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
	Machining of superalloys:-	
	Drilling of super alloys is usually carried out using non-conventional machining techniques such as EDM.	1 1
	Grinding of superalloys is done using aluminium oxide wheels.	1 1
		10

× × ×

Vinay-P 02/7/21
Subject Incharge
[Prof. VINAY.P]

Reviewed 2/7/21
[Prof. DEEPA.M.S]

(V Ragavan) 2/7/21
PROFESSOR & HEAD
Department of Aeronautical Engineering
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CHICKBALLAPUR-562101

Name of the staff: VINAY P
Subject:AIRCRAFT MATERIAL SCIENCE **Sub code: 18AE45** **Semester: IV**
Mapping of CO matrix with Test- Question Papers **(IA-1)**

SL. NO.	USN	NAME	C01	C01	C01	C01	C01	C01	C01	C01	C02	C02	Total	TOTAL
			10	10	10	10	10	10	10	10	10	10	50	30
			1	2	3	4	5	6	7	8	9	10		
1.	1SJ19AE001	AKASH R	8			8	8		8			8	40	24
2.	1SJ19AE003	AYUSH BOTHRA	9			9	9		9			9	45	27
3.	1SJ19AE004	DEEPAK M	9			9	9		9		9		45	27
4.	1SJ19AE005	DIVYASHREE N	9			9	9			9		9	45	27
5.	1SJ19AE007	JEEVAN J	7			5	7		7		7		33	20
6.	1SJ19AE008	KAMAVARAM HARISH												AB
7.	1SJ19AE009	M D ADARSH												AB
8.	1SJ19AE010	M DINESH REDDY												AB
9.	1SJ19AE011	MADHU R	8			8	8		8		8		40	24
10	1SJ19AE012	MANJUNATH J	10			10	10		10		10		50	30
11	1SJ19AE013	MEGHANA D	10			10	10		10		10		50	30
12	1SJ19AE015	MUZAMMIL PASHA S B	10			10	10		10		10		50	30
13	1SJ19AE016	NACHIKET	10			10		10	10		10		50	30
14	1SJ19AE017	NANDAVARAPRASAD D M	8			8	8		8		8		40	24
15	1SJ19AE018	NIVEDITHA S	10			10	10		10		10		50	30
16	1SJ19AE019	PRUTHVI R S	9			9	9		9				36	22
17	1SJ19AE020	PUNITH P	8				8			8	8		32	19
18	1SJ19AE021	RAGHAVENDRA M	8			8				8	8		32	19
19	1SJ19AE022	RAVIKUMARNAIK B	8			8	8			8	8		40	24
20	1SJ19AE023	ROHAN S	10			10		10		10	10		50	30
21	1SJ19AE024	SENAGASETTY DURGA DADEEPYA	9			9	9		9			9	45	27
22	1SJ19AE025	SHIREESHA B	10			9	10		9			9	47	28
23	1SJ19AE027	SHIVARAJ VENKOB	9			9	9		9	9				27
24	1SJ19AE028	SHREYAS R		9			9	9		9	9			27
25	1SJ19AE029	SHRIDEVI												29
26	1SJ19AE030	SHWETA	9			9	9		9		9		45	27
27	1SJ19AE031	SOUJANYA K N	9			9		9		9		9	45	27

28	1SJ19AE032	SRISTI PRAKASH HONAKERI		10		10	9			9	9		47	28
29	1SJ19AE033	SUDARSHAN C M	7			7	7		7			7	35	21
30	1SJ19AE035	SUHAIL AHAMED A												27
31	1SJ19AE036	SUJAY R HIREMATH												30
32	1SJ19AE037	VARSHINI R	10			10	10			10	10		50	30
33	1SJ19AE038	VARUN S	7			7	7		7			7	35	21
34	1SJ19AE039	VENKATESHPRASAD M K	9			9	9		9	9				27
35	1SJ19AE040	VENU P K		8		8	8		8		8		40	24
36	1SJ19AE041	VINODH KUMAR K R												27
37	1SJ19AE042	VISHWAJITH M	8			8	8		8		8		40	24
38	1SJ19AE043	VISHWANATH HIREKENCHANAGOUDR	8			8	8		8		8		40	24
39	1SJ19AE044	SUMAN PARVEEN	10			10	10		10			10	50	30
40	1SJ18AE063	Yogesh E S	8			8	8		8		8		40	24
41	1SJ18AE010	Bhaskar S	9				9				9		27	16
42	1SJ18AE020	Gowtham S	8			7	7		8		7		37	22
43	1SJ19AE045	MANOJ B N	9			9	9		9	9				27
44	1SJ19AE046	Vinay KV	9			9	9		9	9			45	27
45	1SJ19AE047	NITYA S	9			9	9		9	9			45	27
46	1SJ20AE400	Keerthan Kumar	7			7	7		7		7		35	21

(V Rajan)
27/7/21.

22/7/21

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||Jai Sri Gurudev ||

S.J.C. Institute of Technology, Chickballapur

Department of Aeronautical Engineering

Subject :Aircraft Material Science

Subject Code: 18AE45

ASSIGNMENT-2

Explain briefly the following process with neat sketches. **(08Marks)**

- **Forging**
- **Extrusion**
- **Sand casting**
- **Die casting**
- **Gas welding**
- **Spot welding**
- **Arc Welding**
- **Injection Molding**
- **Resin Transfer Molding**
- **Pulforming**

(V Rajan)
24/7/21.

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Department of Aeronautical Engineering
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CHICKBALLAPUR-562101

Internal Test Question paper

Name of the staff/s: VINAY P

Date: 28/07/2021 Signature: 28/7/21

Reviewer's Signature: 28/7/21

S.J.C. Institute of Technology
Department of Aeronautical Engineering
Test: II
Semester: IV
Subject Name & Code: Aircraft Material Science(18AE45)
Test Date: 30/07/2021 **Academic Year: 2021 Even sem**

Instructions

Duration: 90 Minutes **Max Marks: 50**

NOTE: Answer all five main questions, choosing one full question from each main

Question Number		Marks	CO	Levels
1	List the classification of composite based on matrix material. Explain each.	10	CO2	L-2
	OR			
2	Describe the different types of fibers used in composite materials	10	CO2	L-2
3	Illustrate pultrusion process with neat sketch	10	CO2	L-2
	OR			
4	Explain stir casting process with neat sketch	10	CO2	L-2
5	Distinguish between composites and monolithic materials. List the applications of composite materials	10	CO2	L-2
	OR			
6	Whether composite material is perfect replacement for traditional materials used in aircrafts? Justify your answer with explanation	10	CO2	L-2
7	Explain the classification of polymer materials	10	CO1	L-2
	OR			
8	List the characteristics, advantages, disadvantages and applications of plastic materials.	10	CO1	L-2
9	Explain the different types of test for Non-scatterable glass.	10	CO1	L-2
	OR			

10	Describe the different types of transparent plastics used in aircraft	10	CO1	L-2

COURSE OUTCOMES:

On successful completion of this course, students should be able to

CO-1. Summarize the properties, Production methods, inspection methods, testing of aircraft materials(L-2)
CO-2. Describe the properties of super alloys, ablative materials and high energy materials(L-2)
CO-3. Understand material corrosion process and prevention technique. (L-2)

DEPARTMENT: AERONAUTICAL ENGINEERING

Scheme & Solutions- TEST- I/II/HH Date: 08/6/2021

Semester: 4th Sem **Subject Title:** Aircraft Material Science **Subject C-** 18AE45

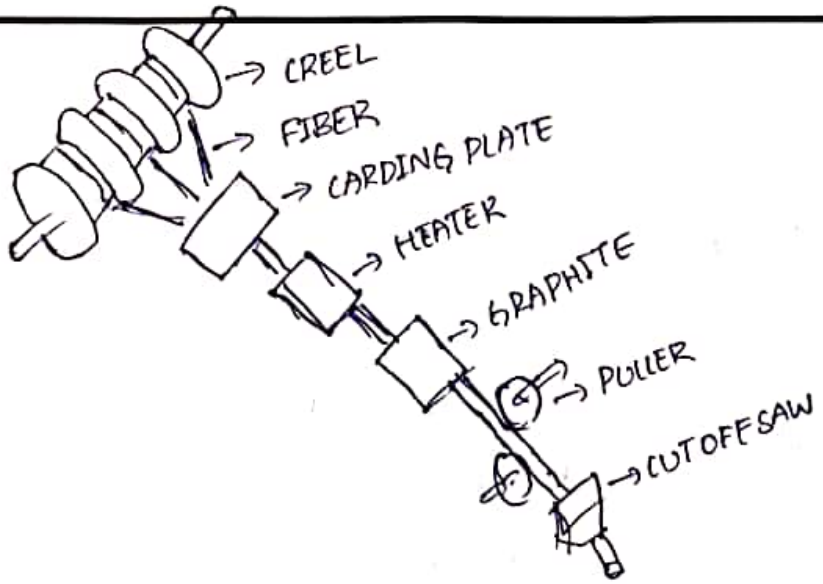
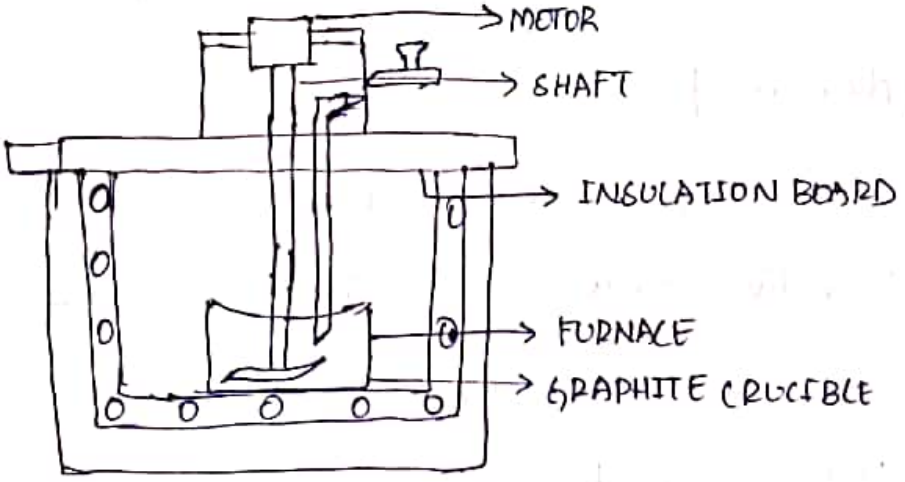
Question Number	Solution
1.	Reinforcing Materials Particulate reinforced: * large, * smaller Fiber: * continuous, * Discontinuous, * Random Structural: * laminates, * sandwich Matrix Materials Polymer: * Thermo-plastic, * Thermoset Metal: * Light metals, * Refractory metals Ceramic: * oxides, carbides, Nitrides of metals, * Carbon & Glass The characteristics of particulates is dependent on the size and distribution of particles, type of matrix and particles and the interface bond strength. Metal matrix composites consist of a metal or an alloy as the continous matrix and a reinforcement that can be particle, fiber.

1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 = 10

Subject Title: Aircraft Material Science **Subject Co** 18AE45

Question Number	Solution	
2.	1. Glass fiber:- It is the most common fiber used in polymer matrix composites. High strength, low cost, high chemical resistance properties.	1 1
	2. Kevlar fiber:- Highly crystalline aromatic polymide fibers. They have the lowest density and highest strength.	1 1
	3. Carbon fiber:- Have carbon content of 95-1. and contain a blend of amorphous carbon and graphite carbon.	1 1
	4. Boron fiber:- This are manufactured by Chemical Vapour deposition process. The most prominent feature of boron fibers is their extremly high tensile modulus.	1 1
	5. Ceramic fiber:- silicon carbide (SiC) and Al_2O_3 are examples for carbon fiber. They are very notable for their high-temperature applications	1 1
		10
3.	* Pultrusion is a continuous molding process that combines fiber reinforcements and thermosetting resin.	1 1
	* Pultrusion is used in the fabrication of composite parts that have a constant cross-section.	1

Subject Title: Aircraft Material Science **Subject Cod** 18AE45

Question Number	Solution	
		1 1 1 1 1
	* Reinforcement in terms of continuous rovings or fiber mats is unrolled from creel holdings rolls and passes through a resin tank.	1 1 10
4.		1 1 1 1 1
	* It consists of furnace with a temperature range of 800c was used to melt the metal. * An electric motor is fixed at the top of the furnace to provide stirring motion to the stirrer. * The speed of the stirrer can be varied.	1 1 1 1 1 1 10

Subject Title: Aircraft Material Science **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
5.	Alloys Metals / Composites	
	* Mixture of two or more single element metals - Homogeneous / * Mixture of two or more metals - Heterogeneous	1
	* single phase / * Two distinct phases	1
	* Lesser strength to weight ratio / * Greater strength to weight ratio	1
	* Easy to analysis / * Difficult to analysis	1
	* Not attainable with metals. / * Possible to achieve combination of properties	1
	Applications of Composites:-	
	* Used in space shuttle satellites	1
	* Automotive parts like engine, piston rods etc.	1
	* Turbines in wind mills	1
	* Hot pressed dies	1
	* Bullet proof jackets.	1
		10

Subject Title: Aircraft Material Science **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
6	Composite material is perfect replacement for traditional materials used in aircrafts.	
	* Composites have high strength to weight ratio	
	The biggest advantage of composites is their high strength to weight ratio	1 1
	* Design Flexibility:- Thermoset composites give designers nearly unlimited flexibility in design.	1 1
	* lower material cost:- Because thermosed composites can be precisely molded, there is little waste.	1 1
	* Improved productivity:- Industrial Designers and Engineers are able to reduce assembly costs by combining several previously assembles parts.	1 1
	* High performance at elevated temperatures, Heat resistance, creep resistance,	1 1
		10

Subject Title: Aircraft Material science **Subject Code** 18AE45

Question Number	Solution	
7.	Based on structure:-	
	a. Linear:- Polymer is represented by a chain.	1
	b. cyclic :- Polymer have no chain ends	1
	c. Branched :- Have side chains or branches, of significant length.	1
	d. Network:- Polymer have three-dimensional structures.	1
	Based on linkage:-	
	a. Homopolymers:- chains with identical bonding linkages to each monomer.	1
	b. Copolymers:- Consists of chains with two or more linkages usually implying two or more different types of monomers.	1
	Based on Reaction:-	
	a. Addition polymers:- Monomer molecules bond without loss of any other atoms.	1
	b. condensation polymers:- Monomer molecules bond with loss of small molecules.	1
	Based on Physical property:-	
	a. Thermoplastics:- Plastics that soften when heated and become firm when cooled.	1
	b.	
	b. Thermosets:- Plastics that soften heated and then harden permanently.	1 / 10

Subject Title: Aircraft Material Science **Subject Code:** 18AE45

Question Number	Solution	
8.	Characteristics :-	1
	* Low Density	1
	* Good mold ability	1
	* low co-efficient of friction.	1
	* Excellent surface finish.	
	Advantages :-	
	* Light weight	1
	* Ease of fabrication	1
	Disadvantages :-	
	* less strength when compared with metals	1
	* cannot withstand high temperature.	1
	Applications :-	
	* windshields, side mirrors	1
	* floorings.	1
		10
9.	a. Test for shatter proofness :- Test consists of	1
	dropping a 227gm spherical steel ball from	1
	a height of 4.8 meter [16 feet] at a centre of	
	a 30mm x 30mm surface of the glass plate	1
	being supported along all edges. by a wooden frame.	
	To pass this test the glass must not break.	1
	b. Test for Heat Resistance / cyclic temp test :-	1
	The glass is keept at 0°c for 30min & then	1
	heated uniformly within two min to 40°c.	1

Subject Title: Aircraft Material science **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
	c. Test for Definition:- A paper telescope is focussed on a distant target. when the glass is interposed in the line of vision btw telescope & object should appear clearly & undistorted.	1 1 1 10
10.	a. Pyralin:- This material is a pyroxylin nitrocellulose plastic. It is a solution of nitrocellulose in camphor.	1 1
	b. Plastecele:- This material is a cellulose acetate plastic. It is manufactured in the same manner as nitrocellulose plastics.	1 1
	c. Vinylite:- This material is a copolymer resin of vinyl chloride and vinyl acetate.	1 1
	d. Plexiglass and lucite:- These are acrylic thermoplastics. They are colourless and transparent and do not discolour with age	1 1
	e. Safite:- Safite is the trade name for general aniline and film. ~~corporation's~~ This material is relatively new and has excellent resistance to heat, abrasion	1 1 10

Subject Incharge (Prof. UINAY-P)

Reviewer (Prof. DEEPA M-S)

V Rajan 8/6/21
PROFESSOR & HOD
Department of Aeronautical Engineering
S.J.C. Institute of Technology
CHICKBALLAPUR-562101

Name of the staff: VINAY P
Subject:AIRCRAFT MATERIAL SCIENCE **Sub code: 18AE45** **Semester: IV**
Mapping of CO matrix with Test- Question Papers **(IA-1I)**

SL. NO.	USN	NAME	CO2	CO2	CO2	CO2	CO2	CO2	CO1	CO1	CO1	CO1	Total	TOTAL 30
			10	10	10	10	10	10	10	10	10	10		
			1	2	3	4	5	6	7	8	9	10	50	
1.	1SJ19AE001	AKASH R		8	8				8		8		32	19
2.	1SJ19AE003	AYUSH BOTHRA		9	9			9	9		9		45	27
3.	1SJ19AE004	DEEPAK M		9	8		8		8		8		41	25
4.	1SJ19AE005	DIVYASHREE N		8	9		8		9		9		43	26
5.	1SJ19AE007	JEEVAN J		7	7		5		7				26	16
6.	1SJ19AE008	KAMAVARAM HARISH		7				6	7				20	12
7.	1SJ19AE009	M D ADARSH											0	AB
8.	1SJ19AE010	M DINESH REDDY											0	AB
9.	1SJ19AE011	MADHU R		7	7						7		21	13
10	1SJ19AE012	MANJUNATH J		9	9			9		9	9		45	27
11	1SJ19AE013	MEGHANA D	9		9		6		9			9	42	25
12	1SJ19AE015	MUZAMMIL PASHA S B		9	9			9	9			9	45	27
13	1SJ19AE016	NACHIKET		9	9			9	9		9		45	27
14	1SJ19AE017	NANDAVARAPRASAD D M		8	8		7		8		7		38	23
15	1SJ19AE018	NIVEDITHA S	10		10		7		10		9		46	28
16	1SJ19AE019	PRUTHVI R S	8			8			8		8		32	19
17	1SJ19AE020	PUNITH P		8	8		7		8		8		39	23
18	1SJ19AE021	RAGHAVENDRA M	9		9			7		8		9	42	25
19	1SJ19AE022	RAVIKUMARNAIK B		7		7	7		7		7		35	21
20	1SJ19AE023	ROHAN S		9	8		8		9		9		43	26
21	1SJ19AE024	SENAGASETTY DURGA DADEEPYA	6		9			8	9		9		41	25
22	1SJ19AE025	SHIREESHA B	9			9		8	8		9		43	26
23	1SJ19AE027	SHIVARAJ VENKOB		8	9				7		8		32	19
24	1SJ19AE028	SHREYAS R		9	8		8		9		9		43	26
25	1SJ19AE029	SHRIDEVI	9		9				8	7	9		42	25
26	1SJ19AE030	SHWETA	9		8			8	9		8		42	25
27	1SJ19AE031	SOUJANYA K N		8	9		8				8		33	20

28	1SJ19AE032	SRISTI PRAKASH HONAKERI	9	9	9		8		8	9			52	31
29	1SJ19AE033	SUDARSHAN C M		7	8			7	8		8		38	23
30	1SJ19AE035	SUHAIL AHAMED A	8		8			8	8		8		40	24
31	1SJ19AE036	SUJAY R HIREMATH		9	9			9	9		9		45	27
32	1SJ19AE037	VARSHINI R		9	9		9		9		9		45	27
33	1SJ19AE038	VARUN S		7	7			7	7		7		35	21
34	1SJ19AE039	VENKATESHPRASAD M K											0	AB
35	1SJ19AE040	VENU P K		9	9		8		8		8		42	25
36	1SJ19AE041	VINODH KUMAR K R		8	8		7		8		8		39	23
37	1SJ19AE042	VISHWAJITH M		8	8		6		8		8		38	23
38	1SJ19AE043	VISHWANATH HIREKENCHANAGOUDR		8	7		8		8		7		38	23
39	1SJ19AE044	SUMAN PARVEEN		9	9			7	9			9	43	26
40	1SJ18AE063	Yogesh E S		7	9		7		8		9		40	24
41	1SJ18AE010	Bhaskar S		9	9						9		27	16
42	1SJ18AE020	Gowtham S		9	9				7		8		33	20
43	1SJ19AE045	MANOJ B N	9		8			7	8	8			40	24
44	1SJ19AE046	Vinay KV	8		9		6			8	9		40	24
45	1SJ19AE047	NITYA S		8	9		7			9	9		40	25
46	1SJ20AE400	Keerthan Kumar		7	8			7	7		8		27	22

(V Rajan) 27/7/21.

PROFESSOR & HEAD
Department of Aeronautical Engineering
S.J.C. Institute of Technology
CHICKBALLAPUR-562101

27/7/21

||Jai Sri Gurudev ||

S.J.C. Institute of Technology, Chickballapur

Department of Aeronautical Engineering

ASSIGNMENT-3

Subject : Aircraft Material Science

Subject Code: 18AE45

1. List out minimum five applications of the following materials in the field of Aircraft.

- Aluminium alloys
- Magnesium alloys
- Titanium alloys
- Copper alloys
- Steels
- Super Alloys
- Nickel Alloys
- Metal matrix composites(MMC's)
- Polymer matrix composites(PMC's)
- Ceramic matrix composites(CMC's)
- Carbon – Carbon Composite Materials
- Wood
- Plastics, Polymers
- Fabrics
- Rubber

Symbolic Representation of Rubrics	Marks Indication	Total
A	On time submission	5
B	Relevant answers with neatness	5
	Final Marks	10

NOTE: The assignment has to be written in A4 sheets.

10/8/21

PROFESSOR & HEAD
Department of Aeronautical Engineering

Internal Test Question paper

Name of the staff/s: VINAY P

Date: 04/08/2021 Signature: 4/8/21

Reviewer's Signature: 4/8/2021

S.J.C. Institute of Technology
Department of Aeronautical Engineering
Test: III
Semester: IV
Subject Name & Code: Aircraft Material Science(18AE45)
Test Date: 07/08/2021 **Academic Year: 2020-2021 Even sem**

Instructions

Duration: 90 Minutes **Max Marks: 50**

NOTE: Answer all five main questions, choosing one full question from each main

Question Number		Marks	CO	Levels
1	Define Ablative materials and explain the process of ablation	10	CO2	L-2
	OR			
2	Discuss the classification of ablative materials.	10	CO2	L-2
3	List and explain the different aircraft wood .	10	CO1	L-2
	OR			
4	Illustrate seasoning of wood. Explain the types of seasoning of wood	10	CO1	L-2
5	Explain the purpose of painting and types of aircraft paintings.	10	CO1	L-2
	OR			
6	Explain aircraft fabric covering.	10	CO1	L-2
7	List and explain the materials used for rockets and missile.	10	CO3	L-2
	OR			
8	Explain different types of propellants used in Rockets	10	CO3	L-2
9	the following: • Parkerizing • Bonderizing	10	CO3	L-2

	OR			
10	Describe the following: • Chrome Pickle treatment • Sealed chrome pickle	10	CO3	L-2

COURSE OUTCOMES:

On successful completion of this course, students should be able to

CO-1. Summarize the properties, Production methods, inspection methods, testing of aircraft materials(L-2)

CO-2. Describe the properties of super alloys, ablative materials and high energy materials(L-2)

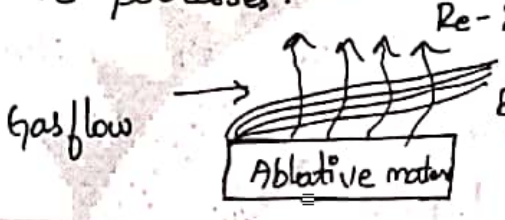
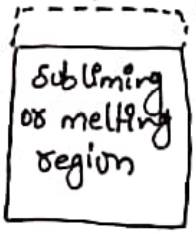
CO-3. Understand material corrosion process and prevention technique. (L-2)

06#Form#03 - Rev. No. 00

DEPARTMENT: AERONAUTICAL ENGINEERING

Scheme & Solutions- TEST- I/II/III **Date:** 04/08/2

Semester: 4th **Subject Title:** Aircraft Material Science **Subject Code:** 18AE

Question Number	Solution	Marks Allocated
1.	Ablation is removal of material from the surface of an object by vaporization, chipping or other erosive processes.	1 1
		1 1
	* Phase changes such as melting, vaporization and sublimation.	1
	* Conduction & storage of heat in the material substrate.	1
	* Absorption of heat by gases as they are forced to the ~~surface~~ substrate surface.	1 1
	* Heat convection in a liquid layer.	1
	* Radiation on the surface and in bulk.	1
		10
2.	There are three groups :-	
	* subliming or melting	1
	* charring ablators	1
	* Intumescent ablators	1
	  	1

Subject Title: Aircraft Material science **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
	Subliming Ablators :- It acts as heat sinks to the incident heat flux until the temperature on the surface reaches the sublimation.	1 1
	Charring Ablators :- They are used in a greater variety of thermal environments than either subliming ablators, because of their ability to withstand a much higher temp.	1 1
	Intumescent Ablators :- Additives in an intumescent ablator form a foam like region on exposure to heat.	1 1 10
4.	When wooden parts are manufactured, it is essential that their moisture content be less that which they will attain service.	1 1
	Air seasoning of wood :-	
	This will be performed by carefully piling the green lumber under a shed. The foundation for the pile of lumber must be atleast 18 inches high and have slope of one inch per foot from front rear.	1 1 1 1

Subject Title: Aircraft Material Science **Subject Code:** 18AEL5

Question Number	Solution	Marks Allocated
	Kiln Drying of wood:- It is based upon the relationship between external air humidity & temperature and the moisture content of wood. The variables such as temperature and humidity are closely regulated by means of heating coils and sprays.	1 1 1 1 10
5.	The final finish operation on aircraft materials is painting. painting consists of the application of a prime coat, followed by finishing coats of varnish, enamel or lacquer.	1 1 1
	Solidifying oils:- This oils which on exposure becomes dry and tough leathery solids. The most common of these oils used in aircraft paints is known as china wood oil. Another common solidifying oil is linseed oil.	1 1 1 1
	Volatile oils:- This oil evaporate when exposed. These oils are used to dilute paint to the proper consistency and to dissolve varnish resins.	1 1 1 10

Subject Code: 18AE46

Subject Title: Aircraft Material science

Question Number	Solution	Marks Allocated
6.	Aircraft fabric covering is a term used for covering aircraft open structures.	1
	wing covering can be done by the envelope, blanket or combination method.	1
	Envelope method:- It consists of sewing several widths of fabric of definite dimensions and then running a transverse seam to make an envelope.	1
	Blanket method:- Consists of machine sewing a number of widths of fabric together, placing it over wing.	1
	Combination method:- It consists of using the envelope method as much as possible and the blanket method on the remainder of the covering.	1
		1
		1
		10
7.	Composite Materials:- Are used to make missile and rocket parts that are often lighter, stronger and more durable.	1
		1
	Carbon - carbon composites:- It is usually made by using a high content carbon resin as the initial matrix and then driving off the	1
		1

Subject Title: Aircraft Material Science **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
	-Carbon elements through high heat.	
	Ceramic composites:- Have strength and thermal properties sufficient for some use as heatshield materials.	1 1
	Fine grain recrystallized bulk graphite:- Is used to create very strong, heat-resistant parts. Are used for reentry vehicle, nose tips, thrust tabs and nozzle throats.	1 1
	Tungsten, molybdenum alloys:- These are used for fabrication of rocket motor components i.e heat shields, nozzle substrates.	1 1 10
8.	Liquid propellants:- The fuel and oxidizer are stored in separate tanks and are fed through a system of pipes, valves. to a combustion chamber where they are combined and burned to produce thrust.	1 1 1
	Solid propellants:- Solid propellant motors are the simplest of all rocket designs. They consist of a casing, usually steel, filled with a mixture of solid compounds that burn at a rapid rate, expelling hot gases from nozzle.	1 1 1

Subject Title: Aircraft Material science

Subject Code: 18AE45

Question Number	Solution	Marks Allocated
	Hybrid Propellants:- one of the substances is solid, usually the fuel. while the other oxidizer is liquid. The liquid is injected into the solid, whose fuel reservoir also serves as the combustion chamber.	1 1
8.	cryogenic propellants:- Is liquified gas at low temperature, such as liquid oxygen or liquid hydrogen. minimizing vaporization losses are necessary with this type.	1 1 10
9.	Parkerizing:- consists of heating the parts to be treated in a bath of dilute iron phosphate. The bath is kept about 190°F. by steam coils. This process has the added advantage of coating the inside of tubular members, which cannot be done by any electroplating process.	1 1 1 1 1
	Bonderizing:- Is the same as parkerizing, except for the addition of the reagents to the bath. which speed up the reaction. The process is completed in from 3 to 5 min.	1 1 1 1

Subject Title: Aircraft Material Science **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
	by this method. After treatment the parts are removed from the bath and hot-rinsed and dried.	1 10
10.	Chrome pickel Treatment:- This treatment is used to protect the material during shipment, storage, machining and for installed material requiring a good electrical bonding connections. The solution consists of 1.5 pounds of sodium dichromate, 15 pounds of nitric acid and water to make 1 gallon. The work should be immersed in this solution at a temperature of 70 to 90°F until sufficiently etched.	1 1 1 1 1
	Sealed chrome-Pickle Treatment:- This treatment is used for long-time protection for all magnesium alloys when close dimensional tolerances are required. The chrome-pickle treatment described above is applied first, and immediately after the work dries a sealing treatment is applied. The sealing treatment consists of immersing the work for 30min in a boiling sol'n.	1 1 1 1 1 10

Subject Title: Aircraft Material science. **Subject Code:** 18AE45

Question Number	Solution	Marks Allocated
3.	* Ash white:- Ash is fairly heavy but is also hard, strong and elastic. It resembles oak in many ways but is lighter, easier to work, tougher and more elastic.	1 1
	* Basswood:- Basswood trees are known by many names such as lime, linden, teil. The wood is light, soft, easy worked and tough.	1 1
	* Beech:- This species of beech is also known as Fagus grandifolia. It is heavy, hard, strong and tough but not durable when exposed.	1 1
	* Birch:- Is heavy, hard, strong, tough and fine-grained, it also takes an excellent finish. Is the best propeller wood.	1 1
	* Chessy:- Black chessy wood is moderately, heavy, hard, strong, easily worked and fairly straight-grained.	1 1 10

Vi·q·P 04/8/21
Subject Incharge
[Prof. Vinay.P]

Reviewer
[Prof. Deepam-S]

V.Rajan 4/8/21

PROFESSOR & HEAD
Department of Aeronautical Engineering
S.J.C. Institute of Technology

Vinay

S.J.C. INSTITUTE OF TECHNOLOGY, CHICKBALLAPUR

Branch : AE Semester : 4

Sl NO.	USN	18AE45
1	1SJ18AE010	30
2	1SJ18AE020	32
3	1SJ18AE063	35
4	1SJ19AE001	31
5	1SJ19AE003	37
6	1SJ19AE004	36
7	1SJ19AE005	37
8	1SJ19AE007	28
9	1SJ19AE008	25
10	1SJ19AE009	24
11	1SJ19AE010	24
12	1SJ19AE011	30
13	1SJ19AE012	40
14	1SJ19AE013	40
15	1SJ19AE015	40
16	1SJ19AE016	40
17	1SJ19AE017	34
18	1SJ19AE018	40
19	1SJ19AE019	33
20	1SJ19AE020	33
21	1SJ19AE021	34
22	1SJ19AE022	31
23	1SJ19AE023	40
24	1SJ19AE024	36
25	1SJ19AE025	37
26	1SJ19AE027	33
27	1SJ19AE028	36
28	1SJ19AE029	37
29	1SJ19AE030	36
30	1SJ19AE031	35
31	1SJ19AE032	39
32	1SJ19AE033	33
33	1SJ19AE035	33
34	1SJ19AE036	39
35	1SJ19AE037	40
36	1SJ19AE038	32

Sl NO.	USN	18AE45
37	1SJ19AE039	37
38	1SJ19AE040	35
39	1SJ19AE041	35
40	1SJ19AE042	34
41	1SJ19AE043	34
42	1SJ19AE044	40
43	1SJ19AE045	36
44	1SJ19AE046	35
45	1SJ19AE047	36
46	1SJ20AE400	32

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S.J.C. INSTITUTE OF TECHNOLOGY, CHICKBALLAPUR

Branch : AS Semester : 4

Sl NO.	USN	18ASL48
1	1SJ19AS001	40
2	1SJ19AS002	28
3	1SJ19AS003	39
4	1SJ19AS004	25
5	1SJ19AS005	36
6	1SJ19AS006	39
7	1SJ19AS007	39
8	1SJ19AS008	25
9	1SJ19AS009	39
10	1SJ19AS010	36
11	1SJ19AS011	38
12	1SJ19AS012	39
13	1SJ19AS013	39
14	1SJ19AS014	39
15	1SJ19AS015	39
16	1SJ19AS017	32
17	1SJ19AS018	38
18	1SJ19AS019	25
19	1SJ19AS020	36
20	1SJ19AS021	39
21	1SJ19AS023	39
22	1SJ19AS025	38
23	1SJ19AS026	36
24	1SJ19AS027	39
25	1SJ19AS028	39
26	1SJ19AS029	36

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Branch : AE Semester : 6

Sl NO.	USN	18AE63
1	1SJ18AE001	36
2	1SJ18AE003	34
3	1SJ18AE004	34
4	1SJ18AE006	38
5	1SJ18AE007	37
6	1SJ18AE008	34
7	1SJ18AE009	36
8	1SJ18AE011	40
9	1SJ18AE012	39
10	1SJ18AE014	37
11	1SJ18AE015	34
12	1SJ18AE016	38
13	1SJ18AE017	38
14	1SJ18AE018	20
15	1SJ18AE019	39
16	1SJ18AE021	37
17	1SJ18AE022	38
18	1SJ18AE023	38
19	1SJ18AE024	37
20	1SJ18AE025	34
21	1SJ18AE026	33
22	1SJ18AE027	36
23	1SJ18AE028	36
24	1SJ18AE029	39
25	1SJ18AE031	34
26	1SJ18AE032	36
27	1SJ18AE033	38
28	1SJ18AE034	39
29	1SJ18AE035	37
30	1SJ18AE036	37
31	1SJ18AE037	37
32	1SJ18AE038	40
33	1SJ18AE039	40
34	1SJ18AE040	37
35	1SJ18AE041	38
36	1SJ18AE042	40

Sl NO.	USN	18AE63
37	1SJ18AE043	36
38	1SJ18AE044	35
39	1SJ18AE045	36
40	1SJ18AE046	40
41	1SJ18AE048	35
42	1SJ18AE049	35
43	1SJ18AE050	40
44	1SJ18AE051	40
45	1SJ18AE052	35
46	1SJ18AE053	37
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50	1SJ18AE057	35
51	1SJ18AE058	36
52	1SJ18AE059	36
53	1SJ18AE060	33
54	1SJ18AE061	37
55	1SJ18AE062	35
56	1SJ18AE064	36
57	1SJ18AE065	34

27/8/21

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27/8/21.

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S.J.C. INSTITUTE OF TECHNOLOGY, CHICKBALLAPUR

Branch : AE Semester : 6

Sl NO.	USN	15AE651
1	1SJ15AE038	17
2	1SJ16AE003	18

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27/8/21

Prof. [illegible]
Department of Aeronautical Engineering
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CHICKBALLAPUR-562101

S J C INSTITUTE OF TECHNOLOGY
Chickballapur - 562 101
Department of Aeronautical Engineering

SJCIT-2020-V1

Programme Name	Aeronautical Engineering				AE
Course Title:	AIRCRFAT MATERIAL SCIENCE				
Subject Code	18AE45	Subject No.	5	Course-ID	C405
Course Coordinator Name:	Prof. VINAY P			Emp. ID	2169
Semester:	4	Section	A	No. of Students Enrolled	43
Year:	2	Academic Year	2020-2021	Programme	UG

Course Details

Create - Format	pdf

Student List

Create - Format	pdf

Format for CIE, Assignment, Quiz, etc Marks Entry		Create - Format	pdf		
Starting Ref. Qn. No.	1	Ending Ref.Qn No.	30	Number of Questions	30
CO attainment Analysis	TEST	3		TEST - 3	TYPE-1
PO attainment Calculation				ACTUAL	
CO Attainment Report	Upto	Analyze-AT	Report- AT	pdf	
Semester End Examination-Results		Create- Format	Analyze-Results	pdf	
Course End Survey		Create-Format	pdf		

Semester End CO-PO-PSO Attainment

CIE	YES	SEE	YES	CES	YES	Analyze	pdf
Consolidated Report - ALL							pdf
List of Slow and Fast Learners Based on CIE Performance						Analyze	pdf
Comparison of CO- PO-PSO Attainment		Create -Format					pdf
Course End Report (CER)						Create-Format	pdf

SJCIT/NBA/ COURSE/ 2020-2021	S J C INSTITUTE OF TECHNOLOGY Chickballapur - 562 101 Department of Aeronautical Engineering

Course Information

Programme Name:	Aeronautical Engineering						
Academic Year:	2020-2021	Semester:	4	Section:	A	Subject Type:	Theory
Course Title:	AIRCRFAT MATERIAL SCIENCE						
Course Instructor Name:	Prof. VINAY P					Class Strength:	
Subject Code:	18AE45	Course No:	5	Course ID:	C405	43	

Scheme of Teaching & Marks

Contact Hr/Week:	3	Lecture Hours (Hr.):	3	Tutorials (Hr.):	0
Max.CIE Marks:	50	Max. SEE Marks:	50	Total Max.Marks:	100
Min.CIE Marks:	20	Min.SEE Marks:	20	Total Min.Marks:	40
Final CIE (IA) Marks:	50	Assignment Marks:	10	Test Marks:	40

Threshold Values for Attainment Calculation							Final CO Attainment			
Attainment level	3	%	2	%	1	%	(Percentage Contribution, %)			
Internal Assessment	>=	65	>=	55	>=	45	CIE	40	SEE	50
SE Examination	>=	55	>=	50	>=	45	-		CES	10

Statements of Course Outcomes		No.of CO's		Target(%)	BL
C405.1	Summarize the properties, inspection methods and testing of aircraft metallic and non-metallic materials			80	L2
C405.2	Describe the properties of super alloys, ablative, composite materials and high energy materials			80	L2
C405.3	Illustrate corrosion and its prevention methods used for material			80	L2

Semester End Exam. (SEE) Target(%)	70	Course End Survey(CES) Target (%):	70

CO-PO Mapping Table (In the scale of 3)													CO-PSO Mapping Table				
CO/PO	1	2	3	4	5	6	7	8	9	10	11	12	CO/PSO	1	2	3	4
C405.1	3								3	3		3	C405.1	1	3		
C405.2	3								3	3		3	C405.2	1	3		
C405.3	3								3	3		3	C405.3	1	3		
Total	9								9	9		9	Total	3	9		

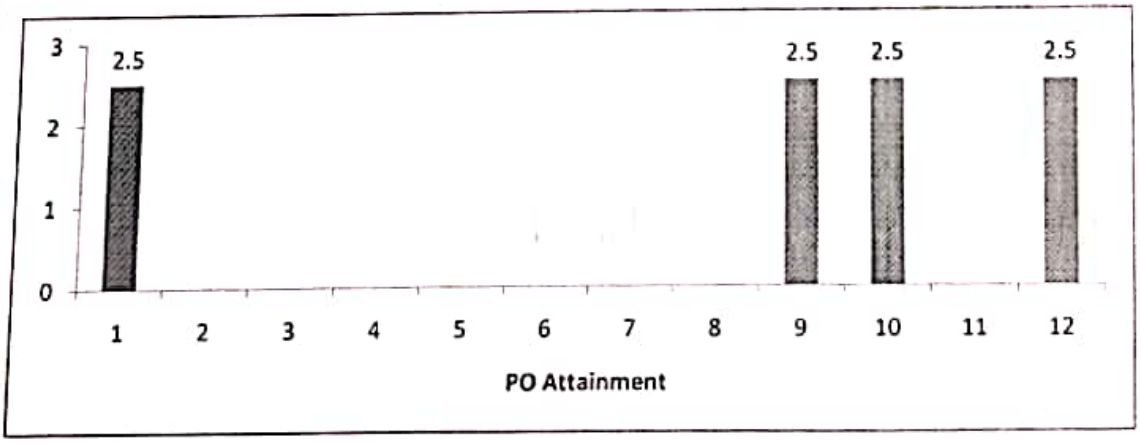
SJCIT/NBA/ CO-PO-PSO REPT/ 2020-2021	S J C INSTITUTE OF TECHNOLOGY Chickballapur - 562 101 Department of Aeronautical Engineering						
Course Title	AIRCRFAT MATERIAL SCIENCE					Course Code	C405
Subject Code	18AE45	Semester	4	Section	A	Emp.ID	2169
Faculty Name	Prof. VINAY P					No.students	43

Summary of CO attainments of Sub: 18AE45 Based on (ACTUAL-TYPE-1) Academic Year:2020-2021

CO	CID_CO	CIE			SEE			CES			TOT_Attainment		
		S_AT	T_ST	ATN	S_AT	T_ST	ATN	S_AT	T_ST	ATN	ATN	%	Status
CO1	C405.1	43	43	3	28	43	2	22	22	3	2.5	84	YES
CO2	C405.2	43	43	3	28	43	2	22	22	3	2.5	84	YES
CO3	C405.3	43	43	3	28	43	2	22	22	3	2.5	84	YES

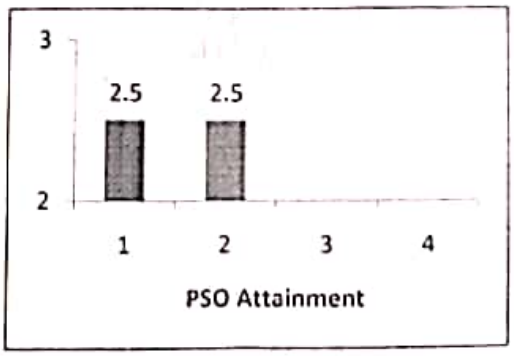
Summary of PO attainments of Sub: 18AE45 Based on (ACTUAL-TYPE-1) Academic Year:2020-2021

PO Number	1	2	3	4	5	6	7	8	9	10	11	12
Direct ATNT(D)	2.45								2.45	2.45		2.45
Indirect ATNT(ID)	3								3	3		3
Total-ATNT	2.5								2.5	2.5		2.5



Summary of PSO attainments in Year:2020-2021

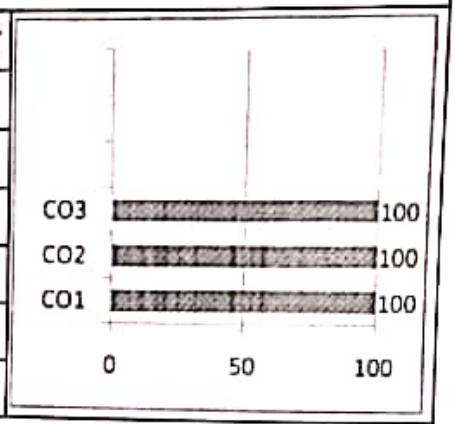
PSO Number	1	2	3	4
Direct ATNT(D)	2.45	2.45		
Indirect ATNT(ID)	3	3		
Total-ATNT	2.5	2.5		



SJCIT/NBA/ CO-REPT/ 2020-2021	S J C INSTITUTE OF TECHNOLOGY Chickballapur - 562 101 Department of Aeronautical Engineering						
Course Title	AIRCRFAT MATERIAL SCIENCE					Course Code	C405
Subject Code	18AE45	Semester	4	Section	A	Emp.ID	2169
Faculty Name	Prof. VINAY P					No.students	43

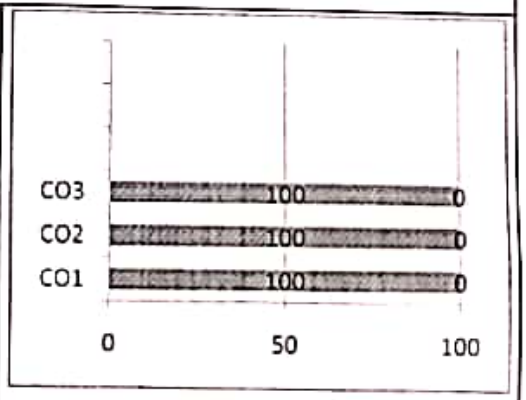
CO Attainment from -TEST - 3, in the Subject: 18AE45-Based on: TYPE-1, Academic Year 2020-2021

Sl.	CO Number	Sum	T_Std	Av-AT	TS(=3)	AT,%	Ac_AT	ATNT
CO1	C405.1	129	43	3	43	100	3	YES
CO2	C405.2	129	43	3	43	100	3	YES
CO3	C405.3	129	43	3	43	100	3	YES



Distribution of CO Attainment from -TEST - 3, in Subj: 18AE45-Based on: TYPE-1, ACDY:2020-2021

Sl.	CO Number	3	%	2	%	1	%
CO1	C405.1	43	100		0		0
CO2	C405.2	43	100		0		0
CO3	C405.3	43	100		0		0



Remarks of Course Intructor

All CO's has been attained.

Signature of HOD/DAC	*Signature of Course Instructor*

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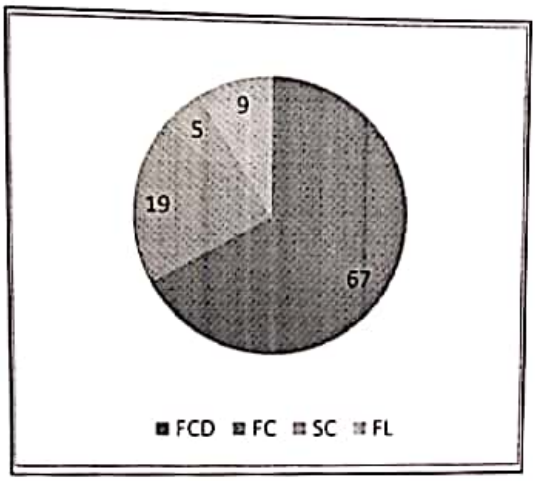
SJCIT/NBA/ SEE-REPT/ 2020-2021	S J C INSTITUTE OF TECHNOLOGY Chickballapur - 562 101 Department of Aeronautical Engineering						
Course Title	AIRCRFAT MATERIAL SCIENCE					Course Code	C405
Subject Code	18AE45	Semester	4	Section	A	Emp.ID	2169
Faculty Name	Prof. VINAY P					No.students	43
	Result Analysis of Subject Code -18AE45 - for the Academic year 2020-2021						



Result Analysis of Section: 4 - A				
No. Students	Pass	%	Fail	%
43	39	91	4	9

Class Analysis of Section: 4 - A			
No. Students	43	%	Grade Point
FCD	29	67	10,9,8
FC	8	19	7
SC	2	5	6,4
FL	4	9	0

Max. and Avg. Marks					
CIE	AVG	SEE	AVG	TOT	AVG
50	44	50	29	100	73

CO Attainment in SEE	
Sum_AT	100
T_students	43
Avg.ATNT	2.3
Sum_AT(=3)	28
AT(=3)%	65
Attainment	NO

ANALYSIS OF GRADE POINT AND GRADE LETTER							
Grade Letter	S	A	B	C	D	E	F
Grade Point	10	9	8	7	6	4	0
No.of Students	1	10	18	8	2		
% of Students	2	23	42	19	5		

CIE and SEE correlation Coefficient	0.75

Course Coordinator Remarks on Semester End Results for the Academic Year2020-2021

91% Result has been achieved.

17/5/22

Signature of Course Coordinator

17/5/2022

Signature HOD/DAC

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CHICKBALLAPUR-562101

SJCIT/NBA/ S&F-REPT/ 2020-2021	S J C INSTITUTE OF TECHNOLOGY Chickballapur - 562 101 Department of Aeronautical Engineering						
Course Title	AIRCRFAT MATERIAL SCIENCE					**Course Code**	C405
Subject Code	18AE45	**Semester**	4	**Section**	A	**Emp.ID**	2169
Faculty Name	Prof. VINAY P					**No.students**	43

List of 10 Students scored Highest Marks (F)

Sl.	USN	NAME	Total_Marks	Rank	Remarks
1	1SJ19AE018	NIVEDITHA S	176	1	
2	1SJ19AE015	MUZAMMIL PASHA S B	175	2	
3	1SJ19AE016	NACHIKET	175	2	
4	1SJ19AE012	MANJUNATH J	175	2	
5	1SJ19AE036	SUJAY R FIREMATH	175	2	
6	1SJ19AE023	ROHAN S	173	3	
7	1SJ19AE037	VARSHINI R	173	3	
8	1SJ19AE044	SUMAN PARVEEN	173	3	
9	1SJ19AE013	MEGHANA D	172	4	
10	1SJ19AE032	SRISTI PRAKASH HONAKERI	168	5	

List of 10 Students scored Lowest Marks (S)

Sl.	USN	NAME	Total_Marks	Rank	Remarks
1	1SJ19AE010	M DINESH REDDY	50	30	
2	1SJ19AE009	M D ADARSH	55	29	
3	1SJ19AE008	KAMAVARAM HARISH	77	28	
4	1SJ19AE007	JEEVAN J	119	27	
5	1SJ19AE039	VENKATESHPRASAD M K	123	26	
6	1SJ19AE022	RAVIKUMAR NAIK B	128	25	
7	1SJ19AE038	VARUN S	133	24	
8	1SJ19AE001	AKASH R	135	23	
9	1SJ19AE011	MADHU R	136	22	
10	1SJ19AE035	SUHAIL AHAMED A	139	21	

Remarks of Course Intructor

12/6/22
Signature of Course Intructor

17/6/2022
Signature of HOD/DAC

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S.J.C. Institute of Technology
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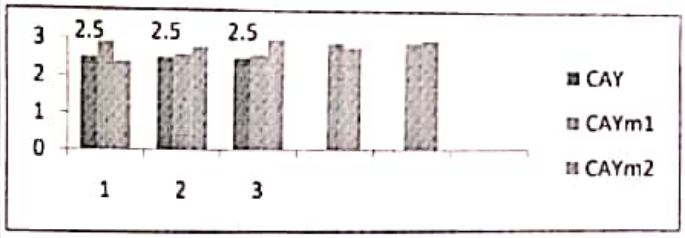
SICIT/NBA/ S&F-REPT/ 2020-2021	S J C INSTITUTE OF TECHNOLOGY Chickballapur - 562 101 Department of Aeronautical Engineering						
Course Title	AIRCRFAT MATERIAL SCIENCE					Course Code	C405
Subject Code	18AE45	Semester	4	Section	A	Emp.ID	2169
Faculty Name	Prof. VINAY P					No.students	43

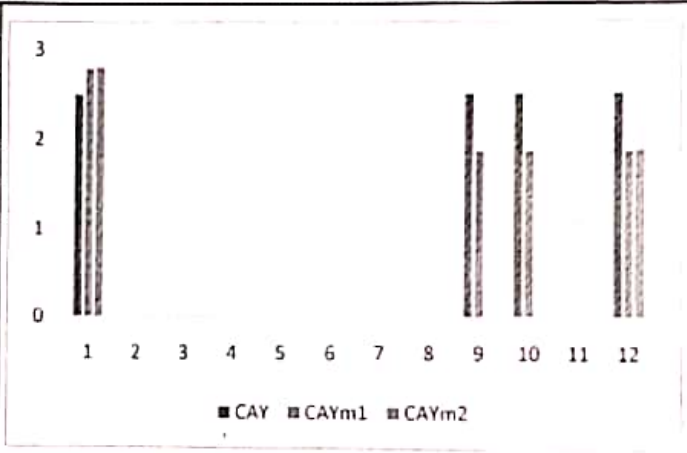
CO-ATTAINMENT COMPARISON FOR THE CAY, CAY-1, CAY-2

Sl.	CO_ID	2020-202	2019-20	2018-19
1	C405.1	2.5	2.92	2.4
2	C405.2	2.5	2.59	2.8
3	C405.3	2.5	2.59	3
			2.92	2.8
			2.93	3



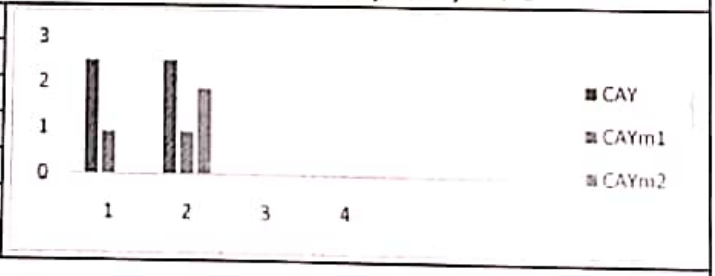
PO-ATTAINMENT COMPARISON FOR THE CAY, CAY-1, CAY-2

Sl.	PO-No.	2020-202	2019-20	2018-19
1	PO-1	2.5	2.79	2.8
2	PO-2			
3	PO-3			
4	PO-4			
5	PO-5			
6	PO-6			
7	PO-7			
8	PO-8			
9	PO-9	2.5	1.86	
10	PO-10	2.5	1.86	
11	PO-11			
12	PO-12	2.5	1.86	1.87



PSO-ATTAINMENT COMPARISON FOR THE CAY, CAY-1, CAY-2

Sl.	PSO-No.	2020-202	2019-20	2018-19
1	PSO-1	2.5	0.93	
2	PSO-2	2.5	0.93	1.87
3	PSO-3			
4	PSO-4			



Academic Year	Course Intructor Name
2020-2021	Prof. VINAY P
2019-20	VINAY.P
2018-19	VINAY.P

17/3/22
Signature of Course Intructor

PROFESSOR & HEAD
Department of Aeronautical Engineering
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