ADAMAS UNIVERSITY

Bachelor In Technology

Course File (Theory)

10. **Name of the Faculty:** Dr. Supriyo Mazumder   & Dr. Aditya Ghosh   **Course Code:**
    MTH11501

11. **Course**   : Engineering Mathematics I   **L: 3**
12. **Program**   : B.Tech   **T: 1**
13. **Target**   : 60%   **P: 0**
                                                              C: 4

THEORY COURSE FILE CONTENTS

Check list Course Outcomes Attainment

S. No.	Contents	Available (Y/N/NA)	Date of Submission	Signature of HOD
1.	Authenticated Syllabus Copy	Y		
2.	Individual Time Table	Y		
3.	Students' Name List (Approved Copy)	Y		
4.	Course Plan, PO, PSO, COs, CO-PO Mapping, COA Plan, Session Plan and Periodic Monitoring	Y		
5.	Previous Year End Semester Question Papers	Y		
6.	Question Bank (All Units - Part A, Part B & C)	Y		
7.	Dissemination of Syllabus and Course Plan to Students	Y	01.09.2020	
8.	Lecture Notes - Unit I, II	Y		
9.	**Sample Documents and Evaluation Sheet for Internal Assessment I** – Tutorials / Assignments / Class Test / Open Book Test / Quiz / Project / Seminar / Role Play if any	Y		
10.	**Mid Term Examination** A. Question Paper / Assessment Tools Used B. Sample Answer Scripts (Best, Average, Poor) if required C. Evaluation Sheet D. Slow Learners List and Remedial Measures	Y	18.01.2021	
11.	Lecture Notes – Unit III & IV	Y		
12.	Tutorial with Solutions - Unit III & IV	Y		
13.	**Sample Documents and Evaluation Sheet for Internal Assessment II** – Tutorials / Assignments / Class Test / Open Book Test / Quiz / Project / Seminar / Role Play if any	Y		
14.	**End Term Examination** A. Question Paper & Answer Key B. Sample Answer Scripts (Best, Average, Poor) if required C. Evaluation Sheet	Y		

10. Name of the Faculty: Dr. Supriyo Mazumder   & Dr. Aditya Ghosh   **Course Code: MTH11501**

11. Course	: Engineering Mathematics I	**L: 3**		
12. Program	: B.Tech	**T: 1**		
13. Target	: 60%	**P: 0**		
		C: 4		

	D. Slow Learners List and Remedial Measures.			
15.	Content Beyond the Syllabus (Proof)	Y		
16.	Innovative Teaching Tools Used for TLP	Y		
17.	Details of Visiting Faculty Session / Industry Expert / Guest Lecture / Seminar / Field Visit / Webinars / Flipped Class Room / Blended Learning / Online Resources etc.	Y		
18.	Consolidated Mark Statement	Y	26.03.2021	
19.	Course End Survey (Indirect Assessment) & Consolidation	Y		
20.	CO Attainment (Mid Term + Class Assessment + End Term)	Y		
21.	Gap Analysis & Remedial Measures	Y		
22.	CO - PO Attainment	Y	07.04.2021	
23.	Class Record (Faculty Logbook)	Y		

Signature of HOD/ Dean   **Signature of Faculty**

Date: **Date: 07.04.2021**

10. Name of the Faculty: Dr. Supriyo Mazumder   & Dr. Aditya Ghosh   Course Code:
    MTH11501
11. Course   : Engineering Mathematics I   L: 3
12. Program   : B.Tech   T: 1
13. Target   : 60%   P: 0
                                                         C: 4

Syllabus Copy

MTA11501	Engineering Mathematics-I	L	T	P	C
Version 1.0	Contact Hours – 60 Hours	3	1	0	4
Pre-requisites/Exposure	12th and graduation level Mathematics				
Co-requisites	--				

Course Objectives

1. To help the student to understand basic concept of abstract and vector algebra with its uses in engineering science.

2. To give emphasis about concepts of differential calculus and enable students to apply these topics in real life problems.

3. To give the students a perspective to learn integral calculus and it's importance in advanced study in engineering science.

4. To enable students acquire fundamental concept of ordinary differential equation and it's applications in engineering science.

Course Content

Unit- I   [20]

Group Theory: Review of concept of set theory, Binary operations, group, abelian group, subgroups, necessary and sufficient condition for a subset of group to be a subgroup, ring, field, examples.

Sequences and Series: Sequences and their limits, convergence of series, comparison test, Ratio test, Root test, Absolute and conditional convergence, alternating series, Power series.

10. **Name of the Faculty:** Dr. Supriyo Mazumder & Dr. Aditya Ghosh **Course Code:** MTH11501
11. **Course** : Engineering Mathematics I L: 3
12. **Program** : B.Tech T: 1
13. **Target** : 60% P: 0
    C: 4

Vector Algebra: Scalar and vector fields, Vector product, Scalar triple product and their interpretation, directional derivative, gradient, Curl, divergence.

Unit- II [16]

Differential Calculus (Functions of one Variable): Limit, continuity, differentiability of functions of single variable, successive differentiation, Leibnitz's theorem, Rolle's Theorem, Cauchy's mean value theorem, Taylor's and Maclaurin's theorems with remainders, indeterminate forms, concavity and convexity of a curve, points of inflexion, asymptotes and curvature.

Differential Calculus (Functions of several variables): Limit, continuity, Differentiability of functions of several variables, partial derivatives and their geometrical interpretation, differentials, derivatives of composite and implicit functions, Euler s theorem on homogeneous functions, harmonic functions, maxima and minima of functions of several variables, Lagrange's method of multipliers.

Unit- III [14]

Integral Calculus: Fundamental theorem of integral calculus, mean value theorems, evaluation of definite integrals, reduction formulae. Convergence of improper integrals, tests of convergence, Beta and Gamma functions, elementary properties, Differentiation under integral sign, differentiation of integrals with variable limits, Leibnitz rule. Rectification, double and triple integrals, computations of area, surfaces and volumes, change of variables in double integrals, Jacobian's of transformations, integrals dependent on parameters, applications.

Unit-IV [10]

Ordinary Differential Equations: First order differential equations, exact, linear and Bernoulli's form, second order differential equations with constant coefficients, method of variation of parameters, general linear differential equations with constant coefficients, Euler's equations, Cauchy-Legendre's equation system of differential equations.

References:

1. ErwynKreyszig : Advanced Engineering Mathematics, John Wiley and Sons
2. B.V. Ramana, Higher Engineering Mathematics Tata McGraw-Hill.
3. B.S.Grewal : Higher Engineering Mathematics, Khanna Publications
4. C B Gupta, S R Singh, Mukesh Kumar: Engineering Mathematics, McGraw Hill Publication.
5. R.K.Jain and S.R.K.Iyengar : Advanced Engineering Mathematics, Narosa Publishing House, 2002

Year: I

Semester: I

10. **Name of the Faculty: Dr. Supriyo Mazumder** & **Dr. Aditya Ghosh** **Course Code: MTH11501**
11. **Course** : **Engineering Mathematics I** **L: 3**
12. **Program** : **B.Tech** **T: 1**
13. **Target** : **60%** **P: 0**

C: 4

Faculty Individual Time Table

ADAMAS UNIVERSITY, KOLKATA								
SCHOOL OF ENGINNERING AND TECHNOLOGY								
DEPARTMENT OF CSE/ME/ECE/EE/CE								
Programme: B.Tech								
Course Code & Course: MTH11501 & Engineering Mathematics-I Faculty Coordinator: Dr. Supriyo Mazumder & Dr. Aditya Ghosh								
Day & Time	9.30 - 10.30	10.30 - 11.30	11.30 - 12.30	12.30 - 1.30	1.30 - 2.30	2.30 - 3.30	3.30 - 4.30	4.30 - 5.30
Monday	EM-I(AG)			LUNCH				
Tuesday								
Wednesday		EM-I(AG)						
Thursday	EM-I(SM)					EM-I(SM)		
Friday								

Signature of HOD **Signature of Class Coordinator**

Date: **Date:**

Year: I

Semester: I

10. **Name of the Faculty: Dr. Supriyo Mazumder   & Dr. Aditya Ghosh   Course Code: MTH11501**

11. **Course   : Engineering Mathematics I**   L: 3
12. **Program   : B.Tech**   T: 1
13. **Target   : 60%**   P: 0
          C: 4

Students Name List

Registration Number	Roll Number	Name of the Student
AU/2020/0004473	UG/02/BTCSE/2020/013	VISHESH MOHANTY
AU/2020/0004474	UG/02/BTCSE/2020/014	Abhishek Thakur
AU/2020/0004475	UG/02/BTCSE/2020/015	Subhendu Roy
AU/2020/0004476	UG/02/BTCSE/2020/016	RHYTHM SEN
AU/2020/0004477	UG/02/BTCSE/2020/017	Ashish Kumar Singh
AU/2020/0004480	UG/02/BTCSE/2020/019	Sagar ghosh
AU/2020/0004487	UG/02/BTECE/2020/003	Rishav Bardhan
AU/2020/0004488	UG/02/BTBIOME/2020/001	Soumyadip Santra
AU/2020/0004489	UG/02/BTME/2020/003	Souhardya Saha
AU/2020/0004490	UG/02/BTCSE/2020/020	Deeptanu Saha
AU/2020/0004491	UG/02/BTCSE/2020/021	Swapnodip Das
AU/2020/0004506	UG/02/BTCSE/2020/023	Subrata Hazra
AU/2020/0004508	UG/02/BTCSECSF/2020/001	Shibsankar saw
AU/2020/0004512	UG/02/BTCSE/2020/024	Aditya Kumar
AU/2020/0004516	UG/02/BTCSE/2020/025	Anushka Khatua
AU/2020/0004518	UG/02/BTCSEAIML/2020/001	Surya Chakraborty
AU/2020/0004519	UG/02/BTCSEAIML/2020/002	Rishav Ghosh
AU/2020/0004527	UG/02/BTCSECSF/2020/002	Mayank Pareek
AU/2020/0004528	UG/02/BTCSEAIML/2020/003	Biswajit Chakraborty
AU/2020/0004531	UG/02/BTCSE/2020/029	Rohan Sutradhar
AU/2020/0004532	UG/02/BTCSE/2020/030	Prathama Sarkar
AU/2020/0004537	UG/02/BTCSE/2020/031	Brinta Deb
AU/2020/0004538	UG/02/BTCSEAIML/2020/004	Pritom Saha
AU/2020/0004544	UG/02/BTCSEAIML/2020/005	Dron Guin

Year: I

Semester: I

10. **Name of the Faculty: Dr. Supriyo Mazumder**   **& Dr. Aditya Ghosh**   **Course Code: MTH11501**

11. **Course**   : **Engineering Mathematics I**   **L: 3**
12. **Program**   : **B.Tech**   **T: 1**
13. **Target**   : **60%**   **P: 0**
   C: 4

AU/2020/0004550	UG/02/BTCSECSF/2020/003	Nilanjana Roy
AU/2020/0004554	UG/02/BTCSECSF/2020/004	Ayush Kumar Singh
AU/2020/0004558	UG/02/BTCSECSF/2020/005	Nilanjana Roy
AU/2020/0004559	UG/02/BTCSEAIML/2020/007	DEBRUP DEY
AU/2020/0004561	UG/02/BTCSEAIML/2020/008	Krishna Debi Das
AU/2020/0004567	UG/02/BTCSEAIML/2020/010	Srijita Saha
AU/2020/0004571	UG/02/BTCSE/2020/037	ARPAN MAITY
AU/2020/0004574	UG/02/BTCSEAIML/2020/012	MD SAHID ALAM
AU/2020/0004576	UG/02/BTCSE/2020/038	Animesh Dutta
AU/2020/0004577	UG/02/BTCSE/2020/039	ARITRA BISWAS
AU/2020/0004579	UG/02/BTCSE/2020/040	SOUMIK DAS
AU/2020/0004581	UG/02/BTCSEAIML/2020/014	Sayanik Sutradhar Sutradhar
AU/2020/0004584	UG/02/BTCSE/2020/043	Atanu Chowdhury
AU/2020/0004586	UG/02/BTCSE/2020/044	SUBHADEEP KAR
AU/2020/0004591	UG/02/BTCSE/2020/045	Priyesh Chanda
AU/2020/0005262	UG/02/BTBIOME/2020/005	MOYURI SEN
AU/2020/0005268	UG/02/BTBIOME/2020/006	Riya Paul
AU/2020/0005270	UG/02/BTBIOME/2020/007	Hritika Adhikary
AU/2020/0005466	UG/02/BTCSE/2020/048	Pragati Kedia
AU/2020/0005518	UG/02/BTBIOME/2020/009	Anwesa Sarkar
AU/2020/0005525	UG/02/BTCSE/2020/050	JIT CHATTERJEE
AU/2020/0005551	UG/02/BTCSECSF/2020/007	MD DAWOOD KHAN

Signature of HOD/Dean   **Signature of Class Coordinator**

Date: **Date: 08.01.2021**

10. **Name of the Faculty: Dr. Supriyo Mazumder   & Dr. Aditya Ghosh   Course Code: MTH11501**

11. **Course   : Engineering Mathematics I   L: 3**
12. **Program   : B.Tech   T: 1**
13. **Target   : 60%   P: 0**
                                                                C: 4

COURSE PLAN

Target	60% (marks)
Level-1	50% (population)
Level-2	60% (population)
Level-3	70% (population)

1.   Method of Evaluation

UG
Internal Assessment (30%)
(Quizzes/Tests, Assignments & Seminars etc.)
Mid Semester Examination (20%)
End Semester Examination (50%)

2.   Passing Criteria

Scale	UG
Out of 10 Point Scale	CGPA – "5.00" Min. Individual Course Grade – "C" Passing Minimum – 35

3.   Pedagogy

- **Direct Instruction**
- Kinesthetic Learning
- **Flipped Classroom**

- Differentiated Instruction
- Expeditionary Learning
- Inquiry Based Learning
- **Personalized Learning**

4.   Topics introduced for the first time in the program through this course

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**
7. **Course**   **: Engineering Mathematics-I**   **L: 3**
8. **Program**   **: B.Tech**   **T: 1**
9. **Target**   **: 60%**   **P: 0**
                                                                           C: 4

5. **References:**

Text Books	Web resources	Journals	Reference books
-	-	-	5

Signature of HOD/Dean   **Signature of Faculty**

Date: **Date: 08.01.2021**

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   Course Code: MTH11501
7. **Course**   : Engineering Mathematics-I   **L: 3**
8. **Program**   : B.Tech   **T: 1**
9. **Target**   : 60%   **P: 0**
                                                                                      C: 4

GUIDELINES TO STUDY THE SUBJECT

Instructions to Students:

1. Go through the 'Syllabus' in the LMS in order to find out the Reading List.
2. Get your schedule and try to pace your studies as close to the timeline as possible.
3. Get your on-line lecture notes (Content, videos) at <u>Lecture Notes</u> section. These are our lecture notes. Make sure you use them during this course.
4. check your LMS regularly
5. go through study material
6. check mails and announcements on blackboard
7. keep updated with the posts, assignments and examinations which shall be conducted on the blackboard
8. Be regular, so that you do not suffer in any way
9. **Cell Phones and other Electronic Communication Devices:** Cell phones and other electronic communication devices (such as Blackberries/Laptops) are not permitted in classes during Tests or the Mid/Final Examination. Such devices MUST be turned off in the class room.
10. **E-Mail and online learning tool:** Each student in the class should have an e-mail id and a pass word to access the LMS system regularly. Regularly, important information – Date of conducting class tests, guest lectures, via online learning tool. The best way to arrange meetings with us or ask specific questions is by email and prior appointment. All the assignments preferably should be uploaded on online learning tool. Various research papers/reference material will be mailed/uploaded on online learning platform time to time.
11. **Attendance:** Students are required to have minimum attendance of 75% in each subject. Students with less than said percentage shall NOT be allowed to appear in the end semester examination.

This much should be enough to get you organized and on your way to having a great semester! If you need us for anything, send your feedback through e-mail supriyo.mazumder@adamasuniversity.ac.in and aditya.ghosh@adamasuniversity.ac.in Please use an appropriate subject line to indicate your message details.

There will no doubt be many more activities in the coming weeks. So, to keep up to date with all the latest developments, please keep visiting this website regularly.

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                           C: 4

RELATED OUTCOMES

1. **The expected outcomes of the Program are:**

PO1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
PO12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

2. **The expected outcomes of the Specific Program are:**

PSO1	Adequate strong skills in learning new programming environments, analyse and design algorithms for efficient computer-based systems of varying complexity.

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**
7. **Course** : Engineering Mathematics-I   **L: 3**
8. **Program** : B.Tech   **T: 1**
9. **Target** : 60%   **P: 0**
     C: 4

PSO2	The ability to understand the evolutionary changes in computing, apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success, real world problems and meet the challenges of the future.
PSO3	Ability to analyse the impact of Computer Science and Engineering solutions in the societal and human context, design, model, develop, test and manage complex software and information management systems.
PSO4	The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, lifelong learning and a zest for higher studies and also to act as a good citizen by inculcating in them moral values & ethics.

3. **The expected outcomes of the Course are: (minimum 4 and maximum 6)**

On completion of this course, the students will be able to

CO 1	**Relate** the idea of basic concepts of abstract algebra and geometrical idea of vector analysis with real world applications.
CO 2	**Extend** the fundamental concepts of differential calculus to apply in real life problems.
CO 3	**Make use of** the fundamental concepts of Integral Calculus and apply these topics in real life problems.
CO 4	**Apply** various solution procedures of Ordinary Differential equations in engineering problems.

4. **Co-Relationship Matrix**
   Indicate the relationships by 1- Slight (Low) 2- Moderate (Medium) 3-Substantial (High)

Program Outcomes / Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	PSO 4
CO1			3	3								3	3			

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**
7. **Course**   : Engineering Mathematics-I   **L: 3**
8. **Program**   : B.Tech   **T: 1**
9. **Target**   : 60%   **P: 0**
                                                              C: 4

		3														
CO2		3 / 3	3	3								3	3			
CO3		3 / 3	3	3								3	3			
CO4		3 / 3	3	3								3	3			
Average	-	3	3	3	-	-	-	-	-	-	-	3	3	-	-	-

5. **Course Outcomes Assessment Plan (COA):**

Course Outcomes	Internal Assessment* (30 Marks)		Mid Term Exam (20 Marks)	End Term Exam (50 Marks)	Total (100 Marks)
	Before Mid Term	**Before End Term**			
CO1	5	NA	11	8	24
CO2	5	NA	9	15	29
CO3	NA	10	NA	13	23
CO4	NA	10	NA	14	24
Total	10	20	20	50	100

* Internal Assessment – Tools Used: Tutorial, Assignment, Seminar, Class Test etc.

Year: I

Semester: I

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                     C: 4

OVERVIEW OF COURSE PLAN OF COURSE COVERAGE

Course Activities:

S. No.	Description	Planned			Actual			Remarks
		From	To	No. of Session	From	To	No. of Session	
1.	Basic algebra & Vector Calculus	3.12.2020	17.12.2020	15	3.12.2020	17.12.2020	15	As per Plan
2.	Differential Calculus	24.12.2020	8.01.2021	15	24.12.2020	8.01.2021	15	As per Plan
3.	Integral Calculus	19.01.2021	5.02.2021	12	19.01.2021	5.02.2021	12	As per Plan
4.	Ordinary differential equations	9.02.2021	26.02.2021	18	9.02.2021	26.02.2021	18	As per Plan

Total No. of Instructional periods available for the course: Sessions

Signature of HOD/Dean   **Signature of Faculty**

Date: **Date: 26.02.2021**

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0

                                                         C: 4

SESSION PLAN
UNIT-I

	Session Plan				Actual Delivery		
Lect.	Date	Topics to be Covered	CO Mapped	Lect.	Date	Topics Covered	CO Achieved
1	3.09.2020	Review of concept of set theory	CO1	1	3.09.2020	Review of concept of set theory	CO1
2	4.09.2020	Idea of relations and functions	CO1	1	4.09.2020	Idea of relations and functions	CO1
3	10.09.2020	Idea of binary operations and examples	CO1	1	10.09.2020	Idea of binary operations and examples	CO1
4	11.09.2020	Definition of group, examples, abelian group	CO1	1	11.09.2020	Definition of group, examples, abelian group	CO1
5	17.09.2020	Definition of subgroup, Examples	CO1	1	17.09.2020	Definition of subgroup, Examples	CO1
6	17.09.2020	Condition of a subset for a group to be a subgroup	CO1	1	17.09.2020	Condition of a subset for a group to be a subgroup	CO1
7	24.09.2020	Introduction to ring theory	CO1	1	24.09.2020	Introduction to ring theory	CO1
8	24.09.2020	Preliminary properties of Ring Theory	CO1	1	24.09.2020	Preliminary properties of Ring Theory	CO1
9	01.10.2020	Idea of Integral Domain and examples	CO1	1	01.10.2020	Idea of Integral Domain and examples	CO1
10	01.10.2020	Idea of Skew field along with examples	CO1	1	01.10.2020	Idea of Skew field along with examples	CO1

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501

7. Course   : Engineering Mathematics-I   L: 3

8. Program   : B.Tech   T: 1

9. Target   : 60%   P: 0

                                                                                                    C: 4

11	8.10.2020	Introduction to field theory and its properties	CO1	1	8.10.2020	Introduction to field theory and its properties	CO1
12	8.10.2020	Different aspects of Rings and Fields	CO1	1	8.10.2020	Different aspects of Rings and Fields	CO1
13	15.10.2020	Problem session in ring and field	CO1	1	15.10.2020	Problem session in ring and field	CO1
14	15.10.2020	Scalar field, definitions	CO1	1	15.10.2020	Scalar field, definitions	CO1
15	29.10.2020	Vector field, definitions	CO1	1	29.10.2020	Vector field, definitions	CO1
16	29.10.2020	Vector product and their properties	CO1	1	29.10.2020	Vector product and their properties	CO1
17	5.11.2020	Definition and properties of Scalar triple product	CO1	1	5.11.2020	Definition and properties of Scalar triple product	CO1
18	5.11.2020	Directional derivative and related problems	CO1	1	5.11.2020	Directional derivative and related problems	CO1
19	12.11.2020	Problems on gradient, Curl, divergence	CO1	1	12.11.2020	Problems on gradient, Curl, divergence	CO1
20	12.11.2020	Review of concept of set theory	CO1	1	12.11.2020	Review of concept of set theory	CO1

Remarks:

Signature of Faculty

Date:

Year: I

Semester: I

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                            C: 4

SESSION PLAN
UNIT-II

Session Plan				Actual Delivery			
Lect.	Date	Topics to be Covered	CO Mapped	Lect.	Date	Topics Covered	CO Achieved
1	2.09.2020	Idea of Limit and continuity	CO2	1	2.09.2020	Idea of Limit and continuity	CO2
2	7.09.2020	Idea of Derivative of a function and Successive derivative	CO2	1	7.09.2020	Idea of Derivative of a function and Successive derivative	CO2
3	9.09.2020	Problems on Successive Derivatives	CO2	1	9.09.2020	Problems on Successive Derivatives	CO2
4	14.09.2020	Leibnitz theorem with applications	CO2	1	14.09.2020	Leibnitz theorem with applications	CO2
5	16.09.2020	Problems on Leibnitz theorem	CO2	1	16.09.2020	Problems on Leibnitz theorem	CO2
6	21.09.2020	Rolle's theorem and Cauchy's Mean value theorem	CO2	1	21.09.2020	Rolle's theorem and Cauchy's Mean value theorem	CO2
7	23.09.2020	Taylor and Maclaurin's theorems with remainders	CO2	1	23.09.2020	Taylor and Maclaurin's theorems with remainders	CO2
8	28.09.2020	Idea of sequences and series along with convergence tests	CO2	1	28.09.2020	Idea of sequences and series along with convergence tests	CO2
9	30.09.2020	Idea of indeterminate forms, concavity and convexity of a curve, points of inflexion	CO2	1	30.09.2020	Idea of indeterminate forms, concavity and convexity of a curve, points of inflexion	CO2
10	5.10.2020	Preliminary idea of Asymptotes	CO2	1	5.10.2020	Preliminary idea of Asymptotes	CO2
11	7.10.2020	Preliminary idea of Curvature	CO2	1	7.10.2020	Preliminary idea of Curvature	CO2
12	12.10.2020	Limit, continuity, Differentiability of functions of several	CO2	1	12.10.2020	Limit, continuity, Differentiability of functions of several	CO2

Year: I
Semester: I

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**

7. **Course** : Engineering Mathematics-I   **L: 3**

8. **Program** : B.Tech   **T: 1**

9. **Target** : 60%   **P: 0**

      C: 4

		variables				variables	
13	14.10.2020	Partial derivatives and their geometrical interpretation, differentials, derivatives of composite and implicit functions	CO2	1	14.10.2020	Partial derivatives and their geometrical interpretation, differentials, derivatives of composite and implicit functions	CO2
14	19.10.2020	Euler's theorem on homogeneous functions, harmonic functions	CO2	1	19.10.2020	Euler's theorem on homogeneous functions, harmonic functions	CO2
15	21.10.2020	Maxima and minima of functions of several variables, Lagrange's method of multipliers	CO2	1	21.10.2020	Maxima and minima of functions of several variables, Lagrange's method of multipliers	CO2

Remarks:

Signature of Faculty

Date:

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                                                                      C: 4

SESSION PLAN
UNIT-III

Session Plan				Actual Delivery			
Lect.	Date	Topics to be Covered	CO Mapped	Lect.	Date	Topics Covered	CO Achieved
1	28.10.2020	Fundamental theorem of integral calculus, mean value theorems	CO3	1	28.10.2020	Fundamental theorem of integral calculus, mean value theorems	CO3
2	2.11.2020	Evaluation of definite integrals, reduction formulae	CO3	1	2.11.2020	Evaluation of definite integrals, reduction formulae	CO3
3	4.11.2020	Different kinds of reduction formulas	CO3	1	4.11.2020	Different kinds of reduction formulas	CO3
4	9.11.2020	Convergence of improper integrals, tests of convergence	CO3	1	9.11.2020	Convergence of improper integrals, tests of convergence	CO3
5	11.11.2020	Beta and Gamma functions, elementary properties	CO3	1	11.11.2020	Beta and Gamma functions, elementary properties	CO3
6	16.11.2020	Problems on Beta Gamma functions	CO3	1	16.11.2020	Problems on Beta Gamma functions	CO3
7	18.11.2020	Differentiation under integral sign	CO3	1	18.11.2020	Differentiation under integral sign	CO3
8	23.11.2020	Differentiation of integrals with variable limits	CO3	1	23.11.2020	Differentiation of integrals with variable limits	CO3
9	2.12.2020	Leibnitz rule	CO3	1	2.12.2020	Leibnitz rule	CO3
10	9.12.2020	Rectification, double and triple integrals	CO3	1	9.12.2020	Rectification, double and triple integrals	CO3
11	16.12.2020	Change of variables in double integrals	CO3	1	16.12.2020	Change of variables in double integrals	CO3
12	06.01.2021	Computations of area	CO3	1	06.01.2021	Computations of area	CO3
13	25.01.2021	Computations of surface and volume	CO3	1	25.01.2021	Computations of surface and volume	CO3

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**
7. **Course**   **: Engineering Mathematics-I**   **L: 3**
8. **Program**   **: B.Tech**   **T: 1**
9. **Target**   **: 60%**   **P: 0**
                                                                                     C: 4

| 14 | 3.02.2021 | Jacobian's of transformations | CO3 | 1 | 3.02.2021 | Jacobian's of transformations | CO3 |
| 15 | 17.02.2021 | Integrals dependent on parameters, applications | CO3 | 1 | 17.02.2021 | Integrals dependent on parameters, applications | CO3 |

Remarks:

Signature of Faculty

Date:

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   Course Code: MTH11501
7. **Course**   : Engineering Mathematics-I   **L: 3**
8. **Program**   : B.Tech   **T: 1**
9. **Target**   : 60%   **P: 0**
                                                                                                    C: 4

SESSION PLAN
UNIT-IV

Session Plan				Actual Delivery			
Le ct.	Date	Topics to be Covered	CO Mapp ed	Le ct.	Date	Topics Covered	CO Achie ved
1	3.12.2 020	Differential Equations, Basic definitions, Formation, Type of Solutions of a differential equation, Illustrative examples	CO4	1	3.12.20 20	Differential Equations, Basic definitions, Formation, Type of Solutions of a differential equation, Illustrative examples	CO4
2	17.12. 2020	Differential equation of First order and first degree: Exact equations, Necessary and sufficient condition of exactness of a first order and first degree ODE (statement only), Illustrative examples	CO4	1	17.12.2 020	Differential equation of First order and first degree: Exact equations, Necessary and sufficient condition of exactness of a first order and first degree ODE (statement only), Illustrative examples	CO4
3	24.12. 2020	Rules for finding Integrating factors, Illustrative examples	CO4	1	24.12.2 020	Rules for finding Integrating factors, Illustrative examples	CO4
4	7.01.2 021	Linear equation, Bernoulli's equation, Illustrative examples	CO4	1	7.01.20 21	Linear equation, Bernoulli's equation, Illustrative examples	CO4
5	21.01. 2021	ODE- Higher order and first degree: General linear ODE of order two with constant coefficients, C.F. & P.I. Illustrative examples	CO4	1	21.01.2 021	ODE- Higher order and first degree: General linear ODE of order two with constant coefficients, C.F. & P.I. Illustrative examples	CO4
6	28.01. 2021	D-operator methods for finding P.I., Illustrative examples	CO4	1	28.01.2 021	D-operator methods for finding P.I., Illustrative examples	CO4
7	4.02.2 021	Method of variation of parameters, Illustrative examples	CO4	1	4.02.20 21	Method of variation of parameters, Illustrative examples	CO4
8	11.02. 2021	Cauchy-Euler equations, Illustrative examples	CO4	1	11.02.2 021	Cauchy-Euler equations, Illustrative examples	CO4

Year: I

Semester: I

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                         C: 4

9	18.02.2021	Solution of simultaneous linear differential equations, Illustrative examples	CO4	1	18.02.2021	Solution of simultaneous linear differential equations, Illustrative examples	CO4
10	25.02.2021	Geometrical and physical applications	CO4	1	25.02.2021	Geometrical and physical applications	CO4

Remarks:

Signature of Faculty

Date:

Year: I

Semester: I

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                 C: 4

PERIODIC MONITORING

Actual date of completion and remarks, if any

Components		From	To	From	To
Duration (Mention from and to Dates)		01.09.2020	16.01.2021	18.01.2021	24.03.2021
Percentage of Syllabus covered		50%		50%	
Lectures	Planned	1	30	1	30
	Taken	1	30	1	30
Tutorials	Planned	NA			
	Taken				
Test/Quizzes/ Mid Semester/ End Semester	Planned	1	1(MID)	1	1(END)
	Taken	1	1	1	1
	CO's Addressed	CO1,CO2	CO1,CO2	CO3,CO4	CO3,CO4
	CO's Achieved	CO1,CO2	CO1,CO2	CO3,CO4	CO3,CO4
Assignments	Planned	1		1	
	Taken	1		1	
	CO's Addressed	CO1,CO2		CO3,CO4	
	CO's Achieved	CO1,CO2		CO3,CO4	
Signature of Faculty					
Head of the Department					
OBE Coordinator					

Signature of HOD/ Dean   **Signature of Faculty**

Date   **Date:**
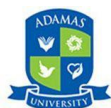
Year: I

Semester: I

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                       C: 4

PERIODIC MONITORING

Attainment of the Course (Learning) Outcomes:

Components	Attainment level	Action Plan	Remarks
Assignment	CO1:		
	CO2:		
	CO3:	Submission Target 28.02.2021	Covered most of the syllabus
	CO4:		
Quiz/Test etc.	CO1:	Conducted on 22.12.2020	Covered First two units
	CO2:		
	CO3:		
	CO4:		
Mid Semester	CO1:	Scheduled on 12.01.2021	Previous year questions are provided to give an idea about the examination pattern
	CO2:		
	CO3:		
	CO4:		
End Semester	CO1:	Scheduled on 22.03.2021	Previous year questions are provided to give an idea about the examination pattern
	CO2:		
	CO3:		
	CO4:		
Any Other	CO1:	NA	
	CO2:		
	CO3:		
	CO4:		

Signature of HOD/ Dean   **Signature of Faculty**

Date   **Date:**

Previous Year Questions

Set-1

ADAMAS UNIVERSITY
END -TERM EXAMINATIONS (January, 2018)
Name of the Program: B.Tech.   SEMESTER-I

General Instructions to Candidates:
1. Please follow all the Instructions given on the cover page of the answer book.
2. Assumptions /abbreviation made if any should be stated clearly at the beginning of your answer.
3. Questions should be answered sequentially.
4. Start answering each section (sections A, B &C) from a new page.

Section-A (Answer ANY FIVE from the following):
[1 x 5=5]

1. The differential equation of the family of curves $y = Ae^{2x} + Be^{-2x}$ after eliminating A and B is

(a) $y_2 = 4y$ (b) $yy'' = (y')^2$ (c) $2yy'' = y' + y$ (d) none of these.

2. An integrating factor of $\dfrac{dy}{dx} + y = \dfrac{1+y}{x}, x > 0$ is

(a) $\dfrac{x}{e^x}$ (b) $\dfrac{e^x}{x}$ (c) xe^x (d) e^x.

3. $\beta(3,2)$ is equal to

(a) $\dfrac{3}{2}$ (b) $\dfrac{1}{12}$ (c) $\dfrac{5}{8}$ (d) $\dfrac{3}{4}$.

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**

7. **Course**   : Engineering Mathematics-I   **L: 3**

8. **Program**   : B.Tech   **T: 1**

9. **Target**   : 60%   **P: 0**

          C: 4

4. The series $\dfrac{1}{\sqrt{1}} + \dfrac{1}{\sqrt{2}} + \dfrac{1}{\sqrt{3}} + \ldots\ldots\ldots$ is

   (a) Convergent   (b) divergent   (c) Oscillatory   (d) None.

5. The degree and order of the differential equation $\left(\dfrac{d^2y}{dx^2}+2\right)^{\frac{3}{2}} = x\dfrac{dy}{dx}$

   (a) $\dfrac{3}{2},2$ (b) 2,3   (c) 3,2   (d) 2,1.

6. Which of the following function obeys Rolle's theorem in $[0,\pi]$

   (a) x (b) $\sin x$ (c) $\cos x$ (d) None

Section-B (Answer ANY THREE Questions):   [5 x 3=15]

7. Discuss the convergence of the following series:

   a) $\displaystyle\sum_{n=1}^{\infty} \dfrac{\cos\cos(nx)}{n^2}$

   b) $\displaystyle\sum_{n=1}^{\infty} \dfrac{u_n}{u_{n+1}}$, if $\displaystyle\sum_{n=1}^{\infty} u_n$ is divergent.

   c) $1 - \dfrac{1}{2} + \dfrac{1}{3} - \dfrac{1}{4} + \ldots$

8. Find $f_{xx}(0,0),\ f_{xy}(0,0),\ f_{yx}(0,0),\ f_{yy}(0,0)$ if

   $f(x,y) = \{\dfrac{xy}{(x^2+y^2)}$, $for\ (x,y)\neq(0,0)$ 0 $,for\ (x,y) = (0,0)$

9. Define "Bernoulli's equation". Hence solve: $2x^2\dfrac{dy}{dx} = xy + y^2$

10. Solve by the method of variation of parameters:

   $$\dfrac{d^2y}{dx^2} + 9y = \sec\sec 3x$$

Section-C (Answer ALL Questions):   [2x10=20]

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501**

7. **Course   : Engineering Mathematics-I   L: 3**

8. **Program   : B.Tech   T: 1**

9. **Target   : 60%   P: 0**

C: 4

11. (a) If the perimeter of a triangle is constant, prove that the area of the triangle is maximum if the triangle is equilateral.

(a) If $f\left(v^2 - x^2, v^2 - y^2, v^2 - z^2\right) = 0$ prove that $\frac{1}{x}\frac{\partial V}{\partial x} + \frac{1}{y}\frac{\partial V}{\partial y} + \frac{1}{z}\frac{\partial V}{\partial z} = \frac{1}{v}$.

(b) Find $\int_{0}^{\frac{\pi}{2}} (tan\, x)^p \, dx$.

(c) Prove that the sequence u_n defined by $u_1 = \sqrt{7}$ and $u_{n+1} = \sqrt{7u_n}$ for all $n \geq 1$ is convergent.

12. (a) Solve the following ODE $x^2 \frac{d^2y}{dx^2} - x\frac{dy}{dx} + 4y = 10(x + \frac{1}{x})$

(b) Solve the following system of simultaneous linear differential equations:

$$\frac{dx}{dt} + 5x + y = e^t, \quad \frac{dy}{dt} + 3y - x = e^{2t}.$$

<u>Set-2</u>

General Instructions to Candidates:

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501**
7. **Course   : Engineering Mathematics-I   L: 3**
8. **Program   : B.Tech   T: 1**
9. **Target   : 60%   P: 0**
                                                                      C: 4

5. Please follow all the Instructions given on the cover page of the answer book.
6. Assumptions /abbreviation made if any should be stated clearly at the beginning of your answer.
7. Questions should be answered sequentially.
8. Start answering each section (sections A, B &C) from a new page.

Section-A (Answer ANY FIVE from the following)   [1 x 5=5]

13. The differential equation of the family of curves $y = x(A+B)^2$ after eliminating A and B is

   (b) $2yy'' = (y')^2$ (b) $yy'' = (y')^2$ (c) $2yy'' = y' + y$ (d)

   $2yy'' = y' - y$.

14. The Wronskian of the independent solutions of $(D^2 - 2D)y = 0$ is

   (a) e^{2x} (b) $2e^{2x}$ (c) $2e^{x}$ (d) None of

   these.

15. $\beta(3,2)$ is equal to

   (b) $\dfrac{3}{2}$ (b) $\dfrac{1}{12}$ (c) $\dfrac{5}{8}$ (d) $\dfrac{3}{4}$.

16. The series $\sum \dfrac{1}{n^p}$ is convergent if

   (a) $p \ge 1$ (b) $p > 1$ (c) $p < 1$ (d)

   $p \le 1$.

17. The order and degree of the differential equation $\left(\dfrac{d^3 y}{dx^3}\right)^2 = x^2 \left(\dfrac{dy}{dx}\right)^3$ are

   (b) 3,2   (b) 2,3   (c) 3,1   (d) 3,3.

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501

7. Course   : Engineering Mathematics-I   L: 3

8. Program   : B.Tech   T: 1

9. Target   : 60%   P: 0

                                                    C: 4

18. If $y = e^{-x}$, then y_n is

    (d) e^x (b) $(-1)^n$ (c) $(-1)^n e^{-x}$ (d) none of

    these.

Section-B (Answer ANY THREE Questions):

[5 x 3=15]

19. Discuss the convergence of the following series:

    d) $\displaystyle\sum_{n=1}^{\infty} \frac{\sin \sin (nx)}{n^2}$

    e) $\displaystyle\sum_{n=1}^{\infty} \frac{u_n}{u_{n+1}}$, if $\displaystyle\sum_{n=1}^{\infty} u_n$ is convergent.

    f) $1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \dots$

20. Find $f_{xx}(0,0)$, $f_{xy}(0,0)$, $f_{yx}(0,0)$, $f_{yy}(0,0)$ if

    $f(x,y) = \{\frac{xy(x^2-y^2)}{(x^2+y^2)}$, $for\ (x,y) \neq (0,0)$ 0 $, for\ (x,y) = (0,0)$

21. Define "Linear differential equation". Hence solve: $(x^2 y^3 + 2xy)dy = dx$

22. Solve by the method of variation of parameters:

$$\frac{d^2 y}{dx^2} + 2\frac{dy}{dx} + y = \frac{e^{-x}}{x^2}$$

Section-C (Answer ALL Questions):

[2x10=20]

23. (a) Find the dimension of a rectangular box of maximum capacity whose surface area is given when the box is open at the top.

    (e) If $V = f(\frac{x}{z}, \frac{y}{z})$, prove that $x\frac{\partial V}{\partial x} + y\frac{\partial V}{\partial y} + z\frac{\partial V}{\partial z} = 0$.

    (f) Find $\displaystyle\int_{0}^{\frac{\pi}{2}} (Cot\ x)^p\ dx$.

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                       C: 4

(g) Prove that the sequence u_n defined by $u_1 = \sqrt{2}$ and $u_{n+1} = \sqrt{2u_n}$ for all $n \geq 1$ is convergent.

24. (a) Reduce the following differential equation to a homogeneous differential equation and hence solve it.

$$(x + 2)^2 \frac{d^2y}{dx^2} - 4(x + 2)\frac{dy}{dx} + 4y = 2 \sin \sin \{2 \log \log (2 + x)\}$$

(b) Solve the following system of simultaneous linear differential equations:

$$\frac{dx}{dt} - 7x + y = 0, \quad \frac{dy}{dt} - 2x - 5y = 0.$$

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0

                                                                   C: 4

Question Bank Sample

School: School of Engineering and Technology Course Code: MTH11501 Program: B.Tech		Department:Computer Science and Engineering Course Name: Engineering Mathematics-I Semester: I		
Sl. No.	Question	Level of Difficulty (Easy/ Medium/ Difficult)	Knowledge Level (Bloom's Taxonomy)	Course Outcome (CO)
	UNIT-I			
	Part A (Multiple Choice Questions) (1 mark each)			
1.	If $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ then $div\,\vec{r}$ is i)0 ii)3 iii)-3 iv) 1	Easy	Remembering	CO1
2.	If $\vec{c}$ is a constant vector and $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ then $grad\,(\vec{c}.\,\vec{r})$ is i) $\vec{c}$ ii) $2\vec{c}$ iii) $\vec{r}$ iv) $2\vec{r}$	Medium	Remembering	CO1
3.	The series $\displaystyle\sum \frac{1}{n^p}$ is convergent if i) $p \geq 1$ (ii) $p > 1$ (iii) $p < 1$ (iv) $p \leq 1$.	Difficult	Remembering	CO1
	Part B (Definition/Naming Questions) (2 marks each)			
1.	**Show** that intersection of two subgroup of a group is also a subgroup of that group.	Easy	Remembering	CO1
2.	Let G be a commutative group. Show that the subset S= $\{p \in G: p = p^{-1}\}$ forms a subgroup of G.	Medium	Remembering	CO1
3.	Show that in a group a left identity is also a right identity.	Difficult	Remembering	CO1
	Part C (Short Questions) (3-4 marks each)			

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501

7. Course   : Engineering Mathematics-I   L: 3

8. Program   : B.Tech   T: 1

9. Target   : 60%   P: 0

                                                        C: 4

1.	A relation ρ is defined on the set Z by "$a\,\rho\,b$ if and only if $a - b$ is divisible by 5". Then check whether ρ is an equivalence relation.	**Easy**	Remembering	CO1
2.	**Test** the convergence of the following series: $$\sum_{n=1}^{\infty} \frac{n!2^n}{n^n}$$	**Medium**	Remembering	CO1
3.	Show that $div\left(\vec{A} + \vec{B}\right) = div\vec{A} + div\vec{B}.$	**Difficult**	Remembering	CO1
Part D (Explanation Based Questions) (5 marks each)				
1.	If $\vec{r} = (acost)\hat{i} + (asint)\hat{j} + (at\,tan\alpha)\,\hat{k}$, then show that $\left[\frac{d\vec{r}}{dt}\; \frac{d^2\vec{r}}{dt^2}\; \frac{d^3\vec{r}}{dt^3}\right] = a^3\tan\,tan\,\alpha$.	**Easy**	Remembering	CO1
2.	Show that a proper vector $\vec{r}$ has constant length if $\vec{r}.\frac{d\vec{r}}{dt} = 0.$	**Medium**	Remembering	CO1
3.	Examine the convergence of the following series, $$\sum_{n=1}^{\propto} \frac{n+2}{2(n+1)^2}$$	**Difficult**	Remembering	CO1
Part E (Questions Based on Reasoning) (5 marks each)				
1.	If $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ and $r = |\vec{r}|$, show that $grad f(r) \times \vec{r} = \vec{0}$.	**Easy**	Remembering	CO1
2.	Find $div\vec{F}$ and $curl\vec{F}$, where $\vec{F} = grad\,(x^3 + y^3 + z^3 - 3xyz)$	**Medium**	Remembering	CO1
3.	Consider two sets A and B, with $\eta(A) = 20,\;\eta(B) = 30$ and $\eta(A\cap B) = 10$, where $\eta(A)$ represents number of elements of a set A. Then find $\eta(A\cup B)$.	**Difficult**	Remembering	CO1
Part F (Application Based Questions) (5-10 marks each)				
1.	Examine the convergence of the following series, (ii) $\frac{1.2}{3} + \frac{2.3}{5} + \frac{3.4}{7} + \ldots$	**Easy**	Remembering	CO1

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                 C: 4

	Question	Level of Difficulty	Knowledge Level	CO
2.	Show that $\left[\vec{a} + \vec{b}\ \ \vec{b} + \vec{c}\ \ \vec{c} + \vec{a}\right] = 2[\vec{a}\vec{b}\vec{c}]$, where $\vec{a},\ \vec{b},\ \vec{c}$ are any three vectors.	Medium	Understanding	CO1
3.	Consider the mapping $f: Z \to Z$ defined by $f(x) = x + 1,\ x \in Z$. Then check whether f is a bijective mapping.	Difficult	Remembering	CO1
Part G (Short Notes) (5 marks each)				
1.	If $\vec{r} = \left(x\hat{i} + y\hat{j} + z\hat{k}\right)$ then find $div\,\vec{r}$ and $l\,\vec{r}$.	Easy	Remembering	CO1
2.	Show that a proper vector $\vec{r}$ has constant magnitude if $\vec{r} \times \frac{d\vec{r}}{dt} = \vec{0}$.	Medium	Remembering	CO1
3.	Check that the following is a group or not: Consider the structure $(Q',*)$ where $Q' = Q - \{0\}$ and $ * b = \frac{ab}{2}$, where $*$ is the binary operation defined on Q'.	Difficult	Remembering	CO1

School: School of Engineering and Technology   **Department:Computer Science and Engineering**
Course Code: MTH11501   **Course Name: Engineering Mathematics-I**
Program: B.Tech   **Semester: I**

Sl. No.	Question	Level of Difficulty (Easy/ Medium/ Difficult)	Knowledge Level (Bloom's Taxonomy)	Course Outcome (CO)
	UNIT-II			
Part A (Multiple Choice Questions) (1 mark each)				

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
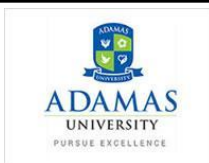8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0

                                                    C: 4

1.	The extreme value of xy when $x^2 + xy + y^2 = 1$ is: i)-1 ii) 1 iii) -2 iv) 0	**Easy**	Understanding	CO2
2.	The function $f(x,y) = 4x^2y - y^2 - 8x^4$ has maximum at: i)(1,1) ii) (1,-1) iii) (0,0) iv) (-1,1)	**Medium**	Understanding	CO2
3.	The function $f(x,y) = 3x^3 + 4x^2y - 3xy^2 - 4y$ is neither maximum nor minimum at i)(1,1) ii) (0,0) iii) (1,-1) iv) (0,1).	**Difficult**	Understanding	CO2
	Part B (Definition/Naming Questions) (2 marks each)			
1.	What is the value of y_n if $y = e^{ax}$?	**Easy**	Understanding	CO2
2.	Define homogeneous function.	**Medium**	Understanding	CO2
3.	Demonstrate Lagrange's Mean Value theorem.	**Difficult**	Understanding	CO2
	Part C (Short Questions) (3-4 marks each)			
1.	Find the value of $\frac{Sin\,x}{x}$ using L'Hospital rule.	**Easy**	Understanding	CO2
2.	Find the value of $\frac{log\,x}{x}$.	**Medium**	Understanding	CO2
3.	Find the Jacobian $J\left(\frac{u,v}{x,y}\right)$ if $u = x - y,\ v = x^2 - y^2$.	**Difficult**	Understanding	CO2
	Part D (Explanation Based Questions) (5 marks each)			
1.	Find the value of y_n, if $y = Sin x\, Sin 2x$.	**Easy**	Understanding	CO2
2.	If $z = e^{xy}$, $x = \sin \sin t$, $y = \cos \cos t$, calculate $\frac{dz}{dt}$ at $t = \frac{\pi}{2}$.	**Medium**	Understanding	CO2
3.	Recall whether the function $f(x,y) = \frac{x^3 + y^3}{xy}$ is a homogeneous function or not.	**Difficult**	Understanding	CO2
	Part E (Questions Based on Reasoning) (5 marks each)			
1.	If $f(x,y) = x\,Cos\,y + y\,Sin\,x$, find $\frac{\partial^2 f}{\partial x \partial y}$.	**Easy**	Understanding	CO2

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0

                                                           C: 4

2.	Find the value of $\frac{\partial f}{\partial x}$ at (1, 1) from definition for the function $f(x, y) = \frac{x+y}{x+y+1}$.	**Medium**	Understanding	CO2
3.	If $u = \left(\frac{x+y}{\sqrt{x}-\sqrt{y}}\right)$, show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + \frac{1}{2}\cot \cot u = 0$.	**Difficult**	Understanding	CO2
Part F (Application Based Questions) (5-10 marks each)				
1.	Find the maximum value of $f(x) = \left(\frac{1}{x}\right)^x$.	**Easy**	Understanding	CO2
2.	If $y = e^{mx}$, show that $\left(1 - x^2\right)y_{n+2} - (2n + 1)xy_{n+1} - \left(n^2 + m^2\right)y_n = 0$.	**Medium**	Understanding	CO2
3.	Find maxima or minima of $f(x, y) = x^3 + y^3 - 3x - 12y + 20$.	**Difficult**	Understanding	CO2
Part G (Short Notes) (5 marks each)				
1.	If $u = f(x, y)$, $x = r \cos \cos \theta$, $y = r \sin \sin \theta$, show that $u_x^2 + u_y^2 = u_r^2 + \frac{1}{r^2}u_\theta^2$.	**Easy**	Understanding	CO2
2.	Show that the function defined by $f(x) = x^p(1 - x)^q$, $p, q \in N$ has a maximum value at $x = \frac{p}{p+q}$.	**Medium**	Understanding	CO2
3.	Find the value of a for which the following limit is finite: $\frac{(\sin\sin 2x + a\sin\sin x)}{x^3}$.	**Difficult**	Understanding	CO2

School: School of Engineering and Technology   **Department:Computer Science and Engineering**
Course Code: MTH11501   **Course Name: Engineering Mathematics-I**
Program: B.Tech   **Semester: I**

Year: I

Semester: I

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
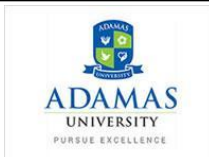8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                      C: 4

Sl. No.	Question	Level of Difficulty (Easy/ Medium/ Difficult)	Knowledge Level (Bloom's Taxonomy)	Course Outcome (CO)
	UNIT-III			
	Part A (Multiple Choice Questions) (1 mark each)			
1.	The value of $\int_{0}^{\frac{\pi}{2}} x\, dx$ is i) $\frac{128}{195}$ ii) $\frac{128}{315}$ iii) $\frac{128\pi}{315}$ iv) none	**Easy**	Applying	CO3
2.	The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} x\, dx$ is i) $\frac{5}{32}$ ii) $\frac{7\pi}{16}$ iii) $\frac{5\pi}{16}$ iv) none	**Medium**	Applying	CO3
3.	The value of $\int_{0}^{2\pi} x\, dx$ is i) $\frac{32}{15}$ ii) $\frac{8}{3}$ iii) $\frac{32\pi}{15}$ iv) $\frac{8\pi}{3}$	**Difficult**	Applying	CO3
	Part B (Definition/Naming Questions) (2 marks each)			
1.	Define Type I improper integral? Mention the various cases of it and ways to solve them.	**Easy**	Applying	CO3
2.	Find: $\int \dfrac{x\,dx}{(x-a)^2 (x-b)}$.	**Medium**	Applying	CO3
3.	Find $\int_{0}^{1} x^3 (1-x^2)^{\frac{5}{2}}\, dx$.	**Difficult**	Applying	CO3
	Part C (Short Questions) (3-4 marks each)			
1.	Find the relation between Beta and Gamma function .	**Easy**	Applying	CO3
2.	Find the volume generated by revolving the circle $x^2 + y^2 = a^2$ about X-axis.	**Medium**	Applying	CO3

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                                       C: 4

3.	Show that $B(m,n) = B(n,m)$.	**Difficult**	Applying	CO3
Part D (Explanation Based Questions) (5 marks each)				
1.	Show that $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$.	**Easy**	Applying	CO3
2.	Evaluate $\int\limits_{0}^{\infty} \frac{dx}{1+x^4}$.	**Medium**	Applying	CO3
3.	Find the dimension of a rectangular box of maximum capacity whose surface area is given when the box is open at the top.	**Difficult**	Applying	CO3
Part E (Questions Based on Reasoning) (5 marks each)				
1.	Evaluate: $\int\limits_{-\infty}^{\infty} e^{-x^2} dx$	**Easy**	Applying	CO3
2.	Using reduction formula prove that $\int\limits_{0}^{\pi/2} \sin^n x\,dx = \begin{cases} \dfrac{n-1}{n}\dfrac{n-3}{n-2}\cdots\dfrac{4}{5}\dfrac{2}{3} & where\,n\,is\,odd\,pos \\ \dfrac{n-1}{n}\dfrac{n-3}{n-2}\cdots\dfrac{3}{4}\dfrac{1}{2}\dfrac{\pi}{2} & where\,n\,is\,even\,po \end{cases}$	**Medium**	Applying	CO3
3.	Evaluate $\int\limits_{0}^{1}\int\limits_{0}^{1} \frac{x-y}{(x+y)^3}\,dydx$	**Difficult**	Applying	CO3
Part F (Application Based Questions) (5-10 marks each)				
1.	Evaluate $\int\limits_{0}^{a}\int\limits_{0}^{\sqrt{a^2-y^2}} (x^2+y^2)\,dxdy$ by changing to polar coordinates.	**Easy**	Applying	CO3
2.	Evaluate $\int\limits_{0}^{a}\int\limits_{0}^{x}\int\limits_{0}^{y} x^3 y^2 z\,dxdydz$.	**Medium**	Applying	CO3

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**
7. **Course** : Engineering Mathematics-I   **L: 3**
8. **Program** : B.Tech   **T: 1**
9. **Target** : 60%   **P: 0**
    C: 4

3.	Find the constants p, q so that the surface $px^2 - qyz = (p+2)x$ is orthogonal to the surface $4x^2 y + z^3$ at the point $(1,2,-1)$.	**Difficult**	**Applying**	CO3
Part G (Short Notes) (5 marks each)				
1.	Show that $$\int_a^b (x-a)^m (b-x)^n\, dx = (b-a)^{m+n+1}\, \mathrm{B}(m+1, n+1),$$ $m, n > 0$.	**Easy**	**Applying**	CO3
2.	Prove that $\Gamma(n+1) = n\Gamma(n)$ where $$\Gamma(n) = \int_0^\infty e^{-x} x^{n-1}\, dx, \quad n > 0.$$ Hence evaluate $$\int_0^\infty e^{-3x} x^4\, dx.$$	**Medium**	**Applying**	CO3
3.	Obtain a reduction formula for $$\int_0^{\frac{\pi}{2}} \sin^m x \cos^n x\, dx$$ where $m, n > 1$ are positive integers.	**Difficult**	**Applying**	CO3

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                 C: 4

School: School of Engineering and Technology Course Code: MTH11501 Program: B.Tech		Department:Computer Science and Engineering Course Name: Engineering Mathematics-I Semester: I		
Sl. No.	**Question**	**Level of Difficulty (Easy/ Medium/ Difficult)**	**Knowledge Level (Bloom's Taxonomy)**	**Course Outcome (CO)**
	UNIT-IV			
	Part A (Multiple Choice Questions) (1 mark each)			
1.	The order of the equation $\frac{dy}{dx} + 5y = 0$ is: i)0 ii)2 iii)1 iv)5.	**Easy**	**Applying**	CO4
2.	An equation is said to be exact if i) $\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}$ ii) $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$ iii) $\frac{\partial M}{\partial x} \neq \frac{\partial N}{\partial y}$ iv) $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y}$	**Medium**	**Applying**	CO4
3.	The degree of the equation $\frac{dy}{dx} + 5y = 0$ is: i)0 ii)2 iii)1 iv)5.	**Difficult**	**Applying**	CO4
	Part B (Definition/Naming Questions) (2 marks each)			
1.	Define order of an ordinary differential equation.	**Easy**	**Applying**	CO4
2.	What is the degree of the differential equation $\left(\frac{d^2y}{d^2x}\right)^2 + y = \frac{dy}{dx}$.	**Medium**	**Applying**	CO4
3.	Solve $\left(D^2 + 4\right)y = 0$.	**Difficult**	**Applying**	CO4
	Part C (Short Questions) (3-4 marks each)			
1.	Solve $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = e^x$.	**Easy**	**Applying**	CO4
2.	Solve by method of variation of parameters: $\frac{d^2y}{dx^2} + a^2y = secax$.	**Medium**	**Applying**	CO4
3.	Solve $x\frac{dy}{dx} - 4y = x^6 e^x$	**Difficult**	**Applying**	CO4

Year: I

Semester: I

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
          C: 4

	Part D (Explanation Based Questions) (5 marks each)			
1.	What is the order of the differential equation $$\left(\frac{d^2y}{d^2x}\right)^2 + y = \frac{dy}{dx}$$	**Easy**	Applying	CO4
2.	Eliminate A and B to find the differential equation from the equation $y = Ae^{2x} + Be^{-2x}$.	**Medium**	Applying	CO4
3.	Find the integrating factor of $\left(x + 2y^3\right)\frac{dx}{dy} = y$.	**Difficult**	Applying	CO4
	Part E (Questions Based on Reasoning) (5 marks each)			
1.	Solve $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 4y = e^{3x}$.	**Easy**	Applying	CO4
2.	Solve $x\frac{dy}{dx} + y = y^2 logx$.	**Medium**	Applying	CO4
3.	Solve by method of variation of parameters: $$\frac{d^2y}{dx^2} + 9y = sec3x$$.	**Difficult**	Applying	CO4
	Part F (Application Based Questions) (5-10 marks each)			
1.	Solve the differential equation $\frac{dy}{dx} + \frac{1}{x}y = x^2$.	**Easy**	Applying	CO4
2.	Describe the general form of the Bernoulli's equation.	**Medium**	Applying	CO4
3.	Solve $x\frac{dy}{dx} + y = x^2y^2$.	**Difficult**	Applying	CO4
	Part G (Short Notes) (5 marks each)			
1.	Check whether the following differential equation is exact: $$2y^2x\,dx + 2x^2y\,dy = 0$$	**Easy**	Applying	CO4
2.	Solve $\frac{dy}{dx} - \frac{tantan\,y}{1+x} = (1 + x) sec\,sec\,y\,e^x$.	**Medium**	Applying	CO4
3.	Check whether the following differential equation is exact and then solve it.	**Difficult**	Applying	CO4

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501

7. Course   : Engineering Mathematics-I   L: 3

8. Program   : B.Tech   T: 1

9. Target   : 60%   P: 0

                                                       C: 4

	$\left(x^3 + xy^4\right)dx + 2y^3 dy = 0$			

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0

                                                                             C: 4

Lecture Notes – Sample

Lecture Notes

Class Test

Instructions:

☐ All candidates are requested to submit the answer script (PDF) in the link by the stipulated time given.

☐ All must write their **NAME and Department** in the top of the answer script.

Answer ALL questions: **4 x 2.5=10**

1. If $u = \sqrt{xy}$, find the value of $\dfrac{\partial^2 u}{\partial x^2} + \dfrac{\partial^2 u}{\partial y^2}$

2. If $u = \dfrac{x^2 + y^2}{\sqrt{(x+y)}}$ and $x\dfrac{\partial u}{\partial x} + y\dfrac{\partial u}{\partial y} = ku$, find the value of k.

3. Check whether $\dfrac{9xy}{x^2 + y^2}$ exists or not.

4. If $u = 4\left(\dfrac{x+y}{\sqrt{x} + \sqrt{y}}\right)$, show that $x\dfrac{\partial u}{\partial x} + y\dfrac{\partial u}{\partial y} = 2\tan\tan\left(\dfrac{u}{4}\right)$

*****All the best*****

Class test answer copy

SCHOOL OF ENGINEERING AND TECHNOLOGY

MID-SEMESTER EXAMINATION (THEORY)

(Academic Session: 2020 – 21, Semester Term: Sep 2020 – Mar 2021)

Name of the Program: B.Tech.   Semester: I
Stream: CSE/ME/CE/EE/ECE/Biotech
PAPER TITLE: Engineering Mathematics- I   PAPER CODE: MTH11501
Maximum Marks: 20   Time duration: 2
hours
Total No of questions: 6   Total No of Pages:

Instructions:
1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. Assumptions made if any, should be stated clearly at the beginning of your answer.
3. All parts of a Question should be answered consecutively.

Answer all the Groups

Group A

*(Answer **ALL** the questions)* $5 \times 1 = 5$

1. **a)** Verify whether the function $f(x) = x^2$ satisfies Rolle's Theorem on the interval [-1, 1].

    b) A relation ρ is defined on the set Z by "$a \rho b$ if and only if $a - b$ is divisible by 5" for , $b \in Z$. Examine whether ρ is reflexive and transitive relation on Z or not.

    c) Find y_n, when $y = log(x + a)$

    d) Prove that $curl(grad(f)) = \vec{0}$.

    e) Find the value of a for which the following limit is finite: $\dfrac{(\sin\sin 2x + a\sin\sin x)}{x^3}$

Group B

*(Answer **ANY 3** questions)* $3 \times 5 = 15$

3. If $y = Cos(logx)$, prove that $x^2 y_{n+2} + (2n + 1)xy_{n+1} + (n^2 - 1)y_n = 0$.

4. Test the convergence of the following series:

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                                    C: 4

(i) $\sum_{n=1}^{\infty} \frac{n! 2^n}{n^n}$.

(ii) $\sum_{n=1}^{\infty} (1 + \frac{1}{\sqrt{n}})^{-n^{\frac{3}{2}}}$.   (

$2.5 + 2.5)$

5. If $u = \left(\frac{x^3 + y^3}{x - y}\right)$, prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \sin \sin 2u$.

6. Show that $div\left(r^n \vec{r}\right) = (n + 3)r^n$, where $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$. Hence show that $\nabla^2\left(r^n \vec{r}\right) = n(n + 3)r^{n-2}\vec{r}$.

************END**********

Mid Sem answer sample

Evaluation Sheet – Mid Semester

Registration Number	Roll Number	Name of the Student	Marks (20)
AU/2020/0004473	UG/02/BTCSE/2020/013	VISHESH MOHANTY	18.00
AU/2020/0004474	UG/02/BTCSE/2020/014	ABHISHEK THAKUR	19.00
AU/2020/0004475	UG/02/BTCSE/2020/015	SUBHENDU ROY	19.50
AU/2020/0004476	UG/02/BTCSE/2020/016	RHYTHM SEN	18.00
AU/2020/0004477	UG/02/BTCSE/2020/017	ASHISH KUMAR SINGH	14.00
AU/2020/0004480	UG/02/BTCSE/2020/019	SAGAR GHOSH	19.00
AU/2020/0004487	UG/02/BTECE/2020/003	RISHAV BARDHAN	17.00
AU/2020/0004488	UG/02/BTBIOME/2020/001	SOUMYADIP SANTRA	19.50
AU/2020/0004489	UG/02/BTME/2020/003	SOUHARDYA SAHA	19.00
AU/2020/0004490	UG/02/BTCSE/2020/020	DEEPTANU SAHA	15.00
AU/2020/0004491	UG/02/BTCSE/2020/021	SWAPNODIP DAS	19.00
AU/2020/0004506	UG/02/BTCSE/2020/023	SUBRATA HAZRA	19.00

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**
7. **Course**   : Engineering Mathematics-I   **L: 3**
8. **Program**   : B.Tech   **T: 1**
9. **Target**   : 60%   **P: 0**

                                             C: 4

AU/2020/0004508	UG/02/BTCSECSF/2020/001	SHIBSANKAR SAW	19.50
AU/2020/0004512	UG/02/BTCSE/2020/024	ADITYA KUMAR	18.00
AU/2020/0004516	UG/02/BTCSE/2020/025	ANUSHKA KHATUA	19.50
AU/2020/0004518	UG/02/BTCSEAIML/2020/001	SURYA CHAKRABORTY	19.50
AU/2020/0004519	UG/02/BTCSEAIML/2020/002	RISHAV GHOSH	20.00
AU/2020/0004527	UG/02/BTCSECSF/2020/002	MAYANK PAREEK	18.00
AU/2020/0004528	UG/02/BTCSEAIML/2020/003	BISWAJIT CHAKRABORTY	18.00
AU/2020/0004531	UG/02/BTCSE/2020/029	ROHAN SUTRADHAR	19.50
AU/2020/0004532	UG/02/BTCSE/2020/030	PRATHAMA SARKAR	19.00
AU/2020/0004537	UG/02/BTCSE/2020/031	BRINTA DEB	18.50
AU/2020/0004538	UG/02/BTCSEAIML/2020/004	PRITOM SAHA	18.00
AU/2020/0004544	UG/02/BTCSEAIML/2020/005	DRON GUIN	19.00
AU/2020/0004550	UG/02/BTCSECSF/2020/003	NILANJANA ROY	0.00
AU/2020/0004554	UG/02/BTCSECSF/2020/004	AYUSH KUMAR SINGH	19.00
AU/2020/0004558	UG/02/BTCSECSF/2020/005	NILANJANA ROY	19.00
AU/2020/0004559	UG/02/BTCSEAIML/2020/007	DEBRUP DEY	18.00
AU/2020/0004561	UG/02/BTCSEAIML/2020/008	KRISHNA DEBI DAS	0.00
AU/2020/0004567	UG/02/BTCSEAIML/2020/010	SRIJITA SAHA	18.50
AU/2020/0004571	UG/02/BTCSE/2020/037	ARPAN MAITY	19.50
AU/2020/0004574	UG/02/BTCSEAIML/2020/012	MD SAHID ALAM	11.00
AU/2020/0004576	UG/02/BTCSE/2020/038	ANIMESH DUTTA	18.00
AU/2020/0004577	UG/02/BTCSE/2020/039	ARITRA BISWAS	18.00
AU/2020/0004579	UG/02/BTCSE/2020/040	SOUMIK DAS	19.50

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501**
7. **Course   : Engineering Mathematics-I   L: 3**
8. **Program   : B.Tech   T: 1**
9. **Target   : 60%   P: 0**
                                                                        C: 4

AU/2020/0004581	UG/02/BTCSEAIML/2020/014	SAYANIK SUTRADHAR SUTRADHAR	19.00
AU/2020/0004584	UG/02/BTCSE/2020/043	ATANU CHOWDHURY	8.00
AU/2020/0004586	UG/02/BTCSE/2020/044	SUBHADEEP KAR	19.00
AU/2020/0004591	UG/02/BTCSE/2020/045	PRIYESH CHANDA	18.50
AU/2020/0005262	UG/02/BTBIOME/2020/005	MOYURI SEN	19.00
AU/2020/0005268	UG/02/BTBIOME/2020/006	RIYA PAUL	19.50
AU/2020/0005270	UG/02/BTBIOME/2020/007	HRITIKA ADHIKARY	17.00
AU/2020/0005466	UG/02/BTCSE/2020/048	PRAGATI KEDIA	19.00
AU/2020/0005518	UG/02/BTBIOME/2020/009	ANWESA SARKAR	19.50
AU/2020/0005525	UG/02/BTCSE/2020/050	JIT CHATTERJEE	19.00
AU/2020/0005551	UG/02/BTCSECSF/2020/007	MD DAWOOD KHAN	16.00

Signature of HOD/Dean   **Signature of Faculty**

Date: **Date: 17.01.2021**

Evaluation Sheet – Internal Assessment (Sample)

REGISTRATION NUMBER	ROLL NUMBER	NAME OF THE STUDENT	MARKS (30)
AU/2020/0004473	UG/02/BTCSE/2020/013	VISHESH MOHANTY	27.00
AU/2020/0004474	UG/02/BTCSE/2020/014	ABHISHEK THAKUR	28.00
AU/2020/0004475	UG/02/BTCSE/2020/015	SUBHENDU ROY	29.00

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**
7. **Course**   : Engineering Mathematics-I   **L: 3**
8. **Program**   : B.Tech   **T: 1**
9. **Target**   : 60%   **P: 0**
                                                                       C: 4

AU/2020/0004476	UG/02/BTCSE/2020/016	RHYTHM SEN	28.00
AU/2020/0004477	UG/02/BTCSE/2020/017	ASHISH KUMAR SINGH	25.00
AU/2020/0004480	UG/02/BTCSE/2020/019	SAGAR GHOSH	29.00
AU/2020/0004487	UG/02/BTECE/2020/003	RISHAV BARDHAN	27.00
AU/2020/0004488	UG/02/BTBIOME/2020/001	SOUMYADIP SANTRA	28.00
AU/2020/0004489	UG/02/BTME/2020/003	SOUHARDYA SAHA	28.00
AU/2020/0004490	UG/02/BTCSE/2020/020	DEEPTANU SAHA	26.00
AU/2020/0004491	UG/02/BTCSE/2020/021	SWAPNODIP DAS	28.00
AU/2020/0004506	UG/02/BTCSE/2020/023	SUBRATA HAZRA	29.00
AU/2020/0004508	UG/02/BTCSECSF/2020/001	SHIBSANKAR SAW	28.00
AU/2020/0004512	UG/02/BTCSE/2020/024	ADITYA KUMAR	27.00
AU/2020/0004516	UG/02/BTCSE/2020/025	ANUSHKA KHATUA	29.00
AU/2020/0004518	UG/02/BTCSEAIML/2020/001	SURYA CHAKRABORTY	28.00
AU/2020/0004519	UG/02/BTCSEAIML/2020/002	RISHAV GHOSH	29.00
AU/2020/0004527	UG/02/BTCSECSF/2020/002	MAYANK PAREEK	27.00
AU/2020/0004528	UG/02/BTCSEAIML/2020/003	BISWAJIT CHAKRABORTY	28.00
AU/2020/0004531	UG/02/BTCSE/2020/029	ROHAN SUTRADHAR	29.00
AU/2020/0004532	UG/02/BTCSE/2020/030	PRATHAMA SARKAR	28.00
AU/2020/0004537	UG/02/BTCSE/2020/031	BRINTA DEB	28.00
AU/2020/0004538	UG/02/BTCSEAIML/2020/004	PRITOM SAHA	27.00
AU/2020/0004544	UG/02/BTCSEAIML/2020/005	DRON GUIN	29.00
AU/2020/0004550	UG/02/BTCSECSF/2020/003	NILANJANA ROY	0.00
AU/2020/0004554	UG/02/BTCSECSF/2020/004	AYUSH KUMAR SINGH	28.00
AU/2020/0004558	UG/02/BTCSECSF/2020/005	NILANJANA ROY	28.00
AU/2020/0004559	UG/02/BTCSEAIML/2020/007	DEBRUP DEY	27.00

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**
7. **Course** : Engineering Mathematics-I   **L: 3**
8. **Program** : B.Tech   **T: 1**
9. **Target** : 60%   **P: 0**
   C: 4

AU/2020/0004561	UG/02/BTCSEAIML/2020/008	KRISHNA DEBI DAS	0.00
AU/2020/0004567	UG/02/BTCSEAIML/2020/010	SRIJITA SAHA	27.00
AU/2020/0004571	UG/02/BTCSE/2020/037	ARPAN MAITY	29.00
AU/2020/0004574	UG/02/BTCSEAIML/2020/012	MD SAHID ALAM	25.00
AU/2020/0004576	UG/02/BTCSE/2020/038	ANIMESH DUTTA	28.00
AU/2020/0004577	UG/02/BTCSE/2020/039	ARITRA BISWAS	27.00
AU/2020/0004579	UG/02/BTCSE/2020/040	SOUMIK DAS	28.00
AU/2020/0004581	UG/02/BTCSEAIML/2020/014	SAYANIK SUTRADHAR SUTRADHAR	28.00
AU/2020/0004584	UG/02/BTCSE/2020/043	ATANU CHOWDHURY	25.00
AU/2020/0004586	UG/02/BTCSE/2020/044	SUBHADEEP KAR	28.00
AU/2020/0004591	UG/02/BTCSE/2020/045	PRIYESH CHANDA	27.00
AU/2020/0005262	UG/02/BTBIOME/2020/005	MOYURI SEN	29.00
AU/2020/0005268	UG/02/BTBIOME/2020/006	RIYA PAUL	29.00
AU/2020/0005270	UG/02/BTBIOME/2020/007	HRITIKA ADHIKARY	27.00
AU/2020/0005466	UG/02/BTCSE/2020/048	PRAGATI KEDIA	29.00
AU/2020/0005518	UG/02/BTBIOME/2020/009	ANWESA SARKAR	28.00
AU/2020/0005525	UG/02/BTCSE/2020/050	JIT CHATTERJEE	29.00
AU/2020/0005551	UG/02/BTCSECSF/2020/007	MD DAWOOD KHAN	26.00

Signature of HOD/Dean   **Signature of Faculty**

Date: **Date:**

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**

7. **Course   : Engineering Mathematics-I**   **L: 3**

8. **Program   : B.Tech**   **T: 1**

9. **Target   : 60%**   **P: 0**

                                                                                                              C: 4

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                       C: 4

COURSE END SURVEY INDIRECT ASSESSMENT

Sample format for Indirect Assessment of Course outcomes:

NAME: Brinta Deb
ENROLLMENT   *NO:* UG/02/BTCSE/2020/031
REG. No.: AU/2020/0004537
COURSE: ENGINEERING Mathematics-I
PROGRAM: B.Tech

Please rate the following aspects of course outcomes of Real Analysis

Course Outcomes	Statement	1	2	3
CO1	Can you relate the concept of basic algebra and vector calculus in engineering science?			3
CO2	What is the basic concept of successive and partial derivative?			3
CO3	Can you apply fundamental concept of integral calculus in real life?			3
CO4	How you can apply the concept of ordinary differential equation in solving engineering problems?			3

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                                                              C: 4

INDIRECT ASSESSMENT CONSOLIDATION

<table>
<tr><td colspan="3" align="center">ADAMAS UNIVERSITY, KOLKATA
SCHOOL OF ENGINEERING & TECHNOLOGY
ALL ENGINEERING DEPARTMENT
CO Indirect Assessment</td></tr>
<tr><td colspan="2">Programme: B.Tech
Batch: 2020-22</td><td>Academic Year: 2020-21</td></tr>
<tr><td>Course Code & Name:</td><td>MTH11501</td><td>Engineering Mathematics I</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td>Course Outcome</td><td>Students Feed Back (5)</td><td>Attainment (100)</td></tr>
<tr><td align="center">CO1</td><td align="right">5</td><td align="right">100</td></tr>
<tr><td align="center">CO2</td><td align="right">5</td><td align="right">100</td></tr>
<tr><td align="center">CO3</td><td align="right">5</td><td align="right">100</td></tr>
<tr><td align="center">CO4</td><td align="right">5</td><td align="right">100</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td colspan="2">Signature of HOD/Dean
Date:</td><td>Signature of Faculty
Date: 01.03.2021</td></tr>
</table>

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                         C: 4

End Semester Question Papers – Set 1

	ADAMAS UNIVERSITY END SEMESTER EXAMINATION (Academic Session: 2020 – 21)		
Name of the Program:	B.Tech. (BME/CSE/ ECE/EE/ME/CE/Biotech)	**Semester:**	I
Paper Title:	Engineering Mathematics-I	**Paper Code:**	SMA41101
Maximum Marks:	50	**Time Duration:**	3 Hrs
Total No. of Questions:	17	**Total No of Pages:**	02
(Any other information for the student may be mentioned here)	1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam. 2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page. 3. Assumptions made if any, should be stated clearly at the beginning of your answer.		

Group A Answer All the Questions (5 x 1 = 5)			
1	Define monotonic increasing sequence.	R	CO1
2	What is the order of homogeneity for $f(x,y) = \frac{xy}{x+y}$	U	CO2
3	Find the value of $\int_0^{\frac{\pi}{4}} x \sin \sin x \, dx$.	AP	CO3
4	Define order of an ordinary differential equation.	AP	CO4
5	What is the degree of the differential equation $\left(\frac{d^2 y}{d^2 x}\right)^2 + y = \frac{dy}{dx}$.	AP	CO4
Group B Answer All the Questions (5 x 2 = 10)			
6 a)	Show that $grad(\varphi_1 + \varphi_2) = grad\varphi_1 + grad\varphi_2$.	R	CO1
(OR)			
6 b)	Show that $div(\vec{A} + \vec{B}) = div\vec{A} + div\vec{B}$.	R	CO1
7 a)	Find whether the following limit exist or not: $\frac{xy}{x^2+y^2}$	U	CO2
(OR)			
7 b)	Determine $\frac{\partial^2 z}{\partial x \partial y}$ for the function $z = xy^2 - x^2 y$.	U	CO2

Year: I
Semester: I

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                         C: 4

8 a)	Define the reduction formula of $\int Sin^n x \, dx$	AP	CO3
	(OR)		
8 b)	Find the value of $\int_0^{\frac{\pi}{4}} tan^n x \, dx$	AP	CO3
9 a)	Solve $\left(e^x siny + e^{-y}\right)dx + \left(e^x cosy - xe^{-y}\right)dy = 0$	AP	CO4
	(OR)		
9 b)	Solve $\left(D^2 + 4\right)y = 0$.	AP	CO4
10 a)	Demonstrate Rolle's theorem.	U	CO2
	(OR)		
10 b)	Find the Jacobian $J\left(\frac{u,v}{x,y}\right)$ if $u = x - y$, $v = x^2 - y^2$.	U	CO2

Group C
Answer All the Questions (7 x 5 = 35)

11 a)	If $\vec{r} = (acost)\hat{i} + (asint)\hat{j} + (at\,tan\alpha)\,\hat{k}$, then show that $\left[\frac{d\vec{r}}{dt} \quad \frac{d^2\vec{r}}{dt^2} \quad \frac{d^3\vec{r}}{dt^3}\right] = a^3 \tan tan\,\alpha$.	R	CO1
	(OR)		
11 b)	Show that a proper vector $\vec{r}$ has constant length if $\vec{r}.\frac{d\vec{r}}{dt} = 0$.	R	CO1
12 a)	Find the value of y_n, if $y = Sinx\, Sin2x$	U	CO2
	(OR)		
12 b)	Find the value of $\frac{e^{x-2}-1}{x-2}$ using L'Hospital rule.	U	CO2
13 a)	Evaluate $\int_0^{\frac{\pi}{2}} x \, dx$	AP	CO3
	(OR)		
13 b)	Evaluate $\int_0^1 \frac{x^7}{\sqrt{1-x^4}}dx$	AP	CO3
14 a)	Solve $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = e^x$.	AP	CO4
	(OR)		
14 b)	Solve by method of variation of parameters: $\frac{d^2y}{dx^2} + a^2 y = secax$.	AP	CO4
15 a)	If $u = \left(\frac{x+y}{\sqrt{x}-\sqrt{y}}\right)$, show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + \frac{1}{2}cot\, cot\, u = 0$	U	CO2
	(OR)		
15 b)	Find the extreme values of $f(x,y) = x^3 + y^3 - 6xy$.	U	CO2
16 a)	Find the area of the surface generated by revolving the parabola $y^2 = 4ax$ about X-axis bounded by $x = a$.	AP	CO3
	(OR)		

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                      C: 4

16 b)	Find the volume generated by revolving the parabola $y^2 = 4ax$ about X-axis bounded by $x = a$.	AP	CO3
17 a)	Solve $x\frac{dy}{dx} - 4y = x^6 e^x$	AP	CO4
(OR)			
17 b)	Solve $x\frac{dy}{dx} + y = y^2 \log x$.	AP	CO4

End Semester Question Papers - Set 2

	ADAMAS UNIVERSITY END SEMESTER EXAMINATION (Academic Session: 2020 – 21)		
Name of the Program:	B.Tech. (BME/CSE/ ECE/EE/ME/CE/Biotech)	**Semester:**	I
Paper Title:	Engineering Mathematics-I	**Paper Code:**	SMA41101
Maximum Marks:	50	**Time Duration:**	3 Hrs
Total No. of Questions:	17	**Total No of Pages:**	02
(Any other information for the student may be mentioned here)	4. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam. 5. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page. 6. Assumptions made if any, should be stated clearly at the beginning of your answer.		

Group A Answer All the Questions (5 x 1 = 5)			
1	What is the value of y_n if $y = e^{ax}$	U	CO2
2	What is the value of $\lim (x, y) \to (2, 3)\ (x^2 + 2y)$	U	CO2
3	Find the value of $\int_0^5 xe^x dx$	AP	CO3

Year: I

Semester: I

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501

7. Course   : Engineering Mathematics-I   L: 3

8. Program   : B.Tech   T: 1

9. Target   : 60%   P: 0

                                                                       C: 4

4	What is the order of the differential equation $\left(\frac{d^2y}{d^2x}\right)^2 + y = \frac{dy}{dx}$	AP	CO4
5	Define monotonic decreasing sequence.	R	CO1
Group B **Answer All the Questions (5 x 2 = 10)**			
6 a)	Show that $curl(\vec{A} + \vec{B}) = curl\vec{A} + curl\vec{B}$.	R	CO1
(OR)			
6 b)	Show that $div(\varphi\vec{A}) = (grad\ \varphi).\vec{A} + \varphi div\vec{A}$.	R	CO1
7 a)	Find whether the following limit exist or not: $\frac{y}{x+y}$	U	CO2
(OR)			
7 b)	Determine $\frac{\partial^2 z}{\partial x \partial y}$ for the function $z = x^2 y - 2xy$.	U	CO2
8 a)	Define the reduction formula of $\int cos^n x dx$	AP	CO3
(OR)			
8 b)	Find the value of $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} cot^7 x\ dx$	AP	CO3
9 a)	Eliminate A and B to find the differential equation from the equation $y = Ae^{2x} + Be^{-2x}$.	AP	CO4
(OR)			
9 b)	Find the integrating factor of $\left(x + 2y^3\right)\frac{dx}{dx} = y$.	AP	CO4
10 a)	Demonstrate Lagrange's mean value theorem.	U	CO2
(OR)			
10 b)	Find the Jacobian $J\left(\frac{u,v}{x,y}\right)$ if $u = 2x - y$, $v = x^2 - xy$.	U	CO2
Group C **Answer All the Questions (7 x 5 = 35)**			
11 a)	If $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ and $r = |\vec{r}|$, show that $grad f(r) \times \vec{r} = \vec{0}$.	R	CO1
(OR)			
11 b)	Show that a proper vector $\vec{r}$ has constant magnitude if $\vec{r} \times \frac{d\vec{r}}{dt} = \vec{0}$.	R	CO1
12 a)	If $y = e^{m\ sin^{-1}x}$, show that $\left(1 - x^2\right)y_{n+2} - (2n + 1)xy_{n+1} - \left(n^2 + m^2\right)y_n = 0$	U	CO2
(OR)			
12 b)	Find the value of $\frac{\partial f}{\partial x}$ at $(1,1)$ from definition for the function $f(x, y) = x + yx + y + 1$	U	CO2
13 a)	Evaluate $\int_0^1 \frac{x^7}{\sqrt{1-x^4}} dx$	AP	CO3
(OR)			

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                                       C: 4

13 b)	Find the volume generated by revolving the parabola $y^2 = 4ax$ about X-axis bounded by $x = a$.	AP	CO3
14 a)	Solve $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 4y = e^{3x}$.	AP	CO4
(OR)			
14 b)	Solve by method of variation of parameters: $\frac{d^2y}{dx^2} + 9y = sec3x$.	AP	CO4
15 a)	If $u = \left(\frac{x+y}{\sqrt{x}-\sqrt{y}}\right)$, show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + \frac{1}{2}\cot\cot u = 0$	U	CO2
(OR)			
15 b)	Find maxima or minima of $f(x,y) = x^3 + y^3 - 3x - 12y + 20$	U	CO2
16 a)	Evaluate $\int_0^{\frac{\pi}{2}} x\, dx$	AP	CO3
(OR)			
16 b)	Find the surface area generated by revolving the parabola $y^2 = 4ax$ about X-axis bounded by $x = a$.	AP	CO3
17 a)	Solve $x\frac{dy}{dx} + y = x^2y^2$.	AP	CO4
(OR)			
17 b)	Solve $\frac{dy}{dx} - \frac{\tan\tan y}{1+x} = (1 + x)\sec\sec y\ e^x$.	AP	CO4

[End Sem answer sample](#)

Evaluation Sheet (End Semester)

REGISTRATION NUMBER	ROLL NUMBER	NAME OF THE STUDENT	MARKS (50)
AU/2020/0004473	UG/02/BTCSE/2020/013	VISHESH MOHANTY	43.00
AU/2020/0004474	UG/02/BTCSE/2020/014	ABHISHEK THAKUR	41.00
AU/2020/0004475	UG/02/BTCSE/2020/015	SUBHENDU ROY	47.00
AU/2020/0004476	UG/02/BTCSE/2020/016	RHYTHM SEN	46.00
AU/2020/0004477	UG/02/BTCSE/2020/017	ASHISH KUMAR SINGH	42.50
AU/2020/0004480	UG/02/BTCSE/2020/019	SAGAR GHOSH	49.00
AU/2020/0004487	UG/02/BTECE/2020/003	RISHAV BARDHAN	30.00
AU/2020/0004488	UG/02/BTBIOME/2020/001	SOUMYADIP SANTRA	50.00

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**
7. **Course**   : Engineering Mathematics-I   **L: 3**
8. **Program**   : B.Tech   **T: 1**
9. **Target**   : 60%   **P: 0**
                                                                          C: 4

AU/2020/0004489	UG/02/BTME/2020/003	SOUHARDYA SAHA	45.00
AU/2020/0004490	UG/02/BTCSE/2020/020	DEEPTANU SAHA	33.00
AU/2020/0004491	UG/02/BTCSE/2020/021	SWAPNODIP DAS	49.00
AU/2020/0004506	UG/02/BTCSE/2020/023	SUBRATA HAZRA	43.50
AU/2020/0004508	UG/02/BTCSECSF/2020/001	SHIBSANKAR SAW	49.00
AU/2020/0004512	UG/02/BTCSE/2020/024	ADITYA KUMAR	45.00
AU/2020/0004516	UG/02/BTCSE/2020/025	ANUSHKA KHATUA	50.00
AU/2020/0004518	UG/02/BTCSEAIML/2020/001	SURYA CHAKRABORTY	49.00
AU/2020/0004519	UG/02/BTCSEAIML/2020/002	RISHAV GHOSH	45.00
AU/2020/0004527	UG/02/BTCSECSF/2020/002	MAYANK PAREEK	50.00
AU/2020/0004528	UG/02/BTCSEAIML/2020/003	BISWAJIT CHAKRABORTY	46.00
AU/2020/0004531	UG/02/BTCSE/2020/029	ROHAN SUTRADHAR	49.00
AU/2020/0004532	UG/02/BTCSE/2020/030	PRATHAMA SARKAR	50.00
AU/2020/0004537	UG/02/BTCSE/2020/031	BRINTA DEB	50.00
AU/2020/0004538	UG/02/BTCSEAIML/2020/004	PRITOM SAHA	49.00
AU/2020/0004544	UG/02/BTCSEAIML/2020/005	DRON GUIN	28.00
AU/2020/0004550	UG/02/BTCSECSF/2020/003	NILANJANA ROY	0.00
AU/2020/0004554	UG/02/BTCSECSF/2020/004	AYUSH KUMAR SINGH	47.00
AU/2020/0004558	UG/02/BTCSECSF/2020/005	NILANJANA ROY	49.00
AU/2020/0004559	UG/02/BTCSEAIML/2020/007	DEBRUP DEY	46.50
AU/2020/0004561	UG/02/BTCSEAIML/2020/008	KRISHNA DEBI DAS	0.00
AU/2020/0004567	UG/02/BTCSEAIML/2020/010	SRIJITA SAHA	50.00
AU/2020/0004571	UG/02/BTCSE/2020/037	ARPAN MAITY	50.00
AU/2020/0004574	UG/02/BTCSEAIML/2020/012	MD SAHID ALAM	48.00

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**
7. **Course**   **: Engineering Mathematics-I**   **L: 3**
8. **Program**   **: B.Tech**   **T: 1**
9. **Target**   **: 60%**   **P: 0**

C: 4

AU/2020/0004576	UG/02/BTCSE/2020/038	ANIMESH DUTTA	50.00
AU/2020/0004577	UG/02/BTCSE/2020/039	ARITRA BISWAS	49.00
AU/2020/0004579	UG/02/BTCSE/2020/040	SOUMIK DAS	50.00
AU/2020/0004581	UG/02/BTCSEAIML/2020/014	SAYANIK SUTRADHAR SUTRADHAR	48.00
AU/2020/0004584	UG/02/BTCSE/2020/043	ATANU CHOWDHURY	42.00
AU/2020/0004586	UG/02/BTCSE/2020/044	SUBHADEEP KAR	49.00
AU/2020/0004591	UG/02/BTCSE/2020/045	PRIYESH CHANDA	45.00
AU/2020/0005262	UG/02/BTBIOME/2020/005	MOYURI SEN	50.00
AU/2020/0005268	UG/02/BTBIOME/2020/006	RIYA PAUL	49.00
AU/2020/0005270	UG/02/BTBIOME/2020/007	HRITIKA ADHIKARY	49.00
AU/2020/0005466	UG/02/BTCSE/2020/048	PRAGATI KEDIA	44.00
AU/2020/0005518	UG/02/BTBIOME/2020/009	ANWESA SARKAR	50.00
AU/2020/0005525	UG/02/BTCSE/2020/050	JIT CHATTERJEE	49.00
AU/2020/0005551	UG/02/BTCSECSF/2020/007	MD DAWOOD KHAN	48.00

Signature of HOD/Dean   **Signature of Faculty**

Date: **Date: 07.04.2021**

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                      C: 4

Consolidated Mark Statement

Registration Number	Roll Number	Name of the Student	Marks			Total (100)
			Mid Semester (20)	Internal Assessment (30)	End Semester (50)	
AU/2020/0004473	UG/02/BTCSE/2020/013	VISHESH MOHANTY	18.00	27.00	43.00	88
AU/2020/0004474	UG/02/BTCSE/2020/014	ABHISHEK THAKUR	19.00	28.00	41.00	88
AU/2020/0004475	UG/02/BTCSE/2020/015	SUBHENDU ROY	19.50	29.00	47.00	95.5
AU/2020/0004476	UG/02/BTCSE/2020/016	RHYTHM SEN	18.00	28.00	46.00	92
AU/2020/0004477	UG/02/BTCSE/2020/017	ASHISH KUMAR SINGH	14.00	25.00	42.50	81.5
AU/2020/0004480	UG/02/BTCSE/2020/019	SAGAR GHOSH	19.00	29.00	49.00	97
AU/2020/0004487	UG/02/BTECE/2020/003	RISHAV BARDHAN	17.00	27.00	30.00	74
AU/2020/0004488	UG/02/BTBIOME/2020/001	SOUMYADIP SANTRA	19.50	28.00	50.00	97.5
AU/2020/0004489	UG/02/BTME/2020/003	SOUHARDYA SAHA	19.00	28.00	45.00	92
AU/2020/0004490	UG/02/BTCSE/2020/020	DEEPTANU SAHA	15.00	26.00	33.00	74
AU/2020/0004491	UG/02/BTCSE/2020/021	SWAPNODIP DAS	19.00	28.00	49.00	96
AU/2020/0004506	UG/02/BTCSE/2020/023	SUBRATA HAZRA	19.00	29.00	43.50	91.5
AU/2020/0004508	UG/02/BTCSECSF/2020/001	SHIBSANKAR SAW	19.50	28.00	49.00	96.5
AU/2020/0004512	UG/02/BTCSE/2020/024	ADITYA KUMAR	18.00	27.00	45.00	90
AU/2020/0004516	UG/02/BTCSE/2020/025	ANUSHKA KHATUA	19.50	29.00	50.00	98.5
AU/2020/0004518	UG/02/BTCSEAIML/2020/001	SURYA CHAKRABORTY	19.50	28.00	49.00	96.5
AU/2020/0004519	UG/02/BTCSEAIML/2020/002	RISHAV GHOSH	20.00	29.00	45.00	94
AU/2020/0004527	UG/02/BTCSECSF/2020/002	MAYANK PAREEK	18.00	27.00	50.00	95
AU/2020/0004528	UG/02/BTCSEAIML/2020/003	BISWAJIT CHAKRABORTY	18.00	28.00	46.00	92

6. **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**
7. **Course**   : Engineering Mathematics-I   **L: 3**
8. **Program**   : B.Tech   **T: 1**
9. **Target**   : 60%   **P: 0**
                                                                                                                    C: 4

AU/2020/0004531	UG/02/BTCSE/2020/029	ROHAN SUTRADHAR	19.50	29.00	49.00	97.5
AU/2020/0004532	UG/02/BTCSE/2020/030	PRATHAMA SARKAR	19.00	28.00	50.00	97
AU/2020/0004537	UG/02/BTCSE/2020/031	BRINTA DEB	18.50	28.00	50.00	96.5
AU/2020/0004538	UG/02/BTCSEAIML/2020/004	PRITOM SAHA	18.00	27.00	49.00	94
AU/2020/0004544	UG/02/BTCSEAIML/2020/005	DRON GUIN	19.00	29.00	28.00	76
AU/2020/0004550	UG/02/BTCSECSF/2020/003	NILANJANA ROY	0.00	0.00	0.00	0
AU/2020/0004554	UG/02/BTCSECSF/2020/004	AYUSH KUMAR SINGH	19.00	28.00	47.00	94
AU/2020/0004558	UG/02/BTCSECSF/2020/005	NILANJANA ROY	19.00	28.00	49.00	96
AU/2020/0004559	UG/02/BTCSEAIML/2020/007	DEBRUP DEY	18.00	27.00	46.50	91.5
AU/2020/0004561	UG/02/BTCSEAIML/2020/008	KRISHNA DEBI DAS	0.00	0.00	0.00	0
AU/2020/0004567	UG/02/BTCSEAIML/2020/010	SRIJITA SAHA	18.50	27.00	50.00	95.5
AU/2020/0004571	UG/02/BTCSE/2020/037	ARPAN MAITY	19.50	29.00	50.00	98.5
AU/2020/0004574	UG/02/BTCSEAIML/2020/012	MD SAHID ALAM	11.00	25.00	48.00	84
AU/2020/0004576	UG/02/BTCSE/2020/038	ANIMESH DUTTA	18.00	28.00	50.00	96
AU/2020/0004577	UG/02/BTCSE/2020/039	ARITRA BISWAS	18.00	27.00	49.00	94
AU/2020/0004579	UG/02/BTCSE/2020/040	SOUMIK DAS	19.50	28.00	50.00	97.5
AU/2020/0004581	UG/02/BTCSEAIML/2020/014	SAYANIK SUTRADHAR SUTRADHAR	19.00	28.00	48.00	95
AU/2020/0004584	UG/02/BTCSE/2020/043	ATANU CHOWDHURY	8.00	25.00	42.00	75
AU/2020/0004586	UG/02/BTCSE/2020/044	SUBHADEEP KAR	19.00	28.00	49.00	96
AU/2020/0004591	UG/02/BTCSE/2020/045	PRIYESH CHANDA	18.50	27.00	45.00	90.5
AU/2020/0005262	UG/02/BTBIOME/2020/005	MOYURI SEN	19.00	29.00	50.00	98
AU/2020/0005268	UG/02/BTBIOME/2020/006	RIYA PAUL	19.50	29.00	49.00	97.5
AU/2020/0005270	UG/02/BTBIOME/2020/007	HRITIKA ADHIKARY	17.00	27.00	49.00	93

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                        C: 4

AU/2020/0005466	UG/02/BTCSE/2020/048	PRAGATI KEDIA	19.00	29.00	44.00	92
AU/2020/0005518	UG/02/BTBIOME/2020/009	ANWESA SARKAR	19.50	28.00	50.00	97.5
AU/2020/0005525	UG/02/BTCSE/2020/050	JIT CHATTERJEE	19.00	29.00	49.00	97
AU/2020/0005551	UG/02/BTCSECSF/2020/007	MD DAWOOD KHAN	16.00	26.00	48.00	90

Signature of Dean/HOD   **Signature of Faculty**

Date: **Date: 07.04.2021**

CO ATTAINMENT – GAP ANALYSIS & REMEDIAL MEASURES

ADAMAS UNIVERSITY, KOLKATA							
SCHOOL OF ENGINEERING & TECHNOLOGY							
ALL ENGINEERING DEPARTMENT							
CO ATTAINMENT - GAP ANALYSIS & REMEDIAL MEASURES							
Batch:	2020-22				Academic Year:	2020-21	
Course Code & Name		Name of the Coordinator			Year & Semester		
MTH11501 & Engineering Mathematics I		Dr. Supriyo Mazumder & Dr. Aditya Ghosh			I & I		
CO	Direct Assessment	Indirect Assessment	CO Attainement	Target	CO Attainment Gaps*	Action for Bridge the Gap	Target Modification
CO1	95.65217391	100	96.52173913	70	-26.52173913		80
CO2	95.65217391	100	96.52173913	70	-26.52173913		80
CO3	95.65217391	100	96.52173913	70	-26.52173913		80
CO4	95.65217391	100	96.52173913	70	-26.52173913		80

Signature of HOD/Dean   **Signature of Faculty**

Date: **Date: 07.04.2021**

6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501
7. Course   : Engineering Mathematics-I   L: 3
8. Program   : B.Tech   T: 1
9. Target   : 60%   P: 0
                                                                                                                  C: 4

CO-PO ATTAINMENT

ADAMAS UNIVERSITY, KOLKATA																		
SCHOOL OF ENGINEERING & TECHNOLOGY																		
ALL ENGINEERING DEPARTMENT																		
CO-PO ATTAINMENT																		
Programme:	B.Tech	Year & Sem:	I & I	Academic Year:	2020-21				Batch:			2020-22						

Course Code	Course Title	CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
MTH21517	Engineering Mathematics I	Relationship	CO1,CO2, CO3, CO4	CO1, CO2, CO3, CO4	NA	NA	CO1, CO2, CO3, CO4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Mapping Value	3	3	NA	NA	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Attainment	2.9	2.9	*	*	2.9	*	*	*	*	*	*	*	*	*	*

Signature of HOD/Dean   **Signature of Faculty**

Date: **Date: 07.04.2021**
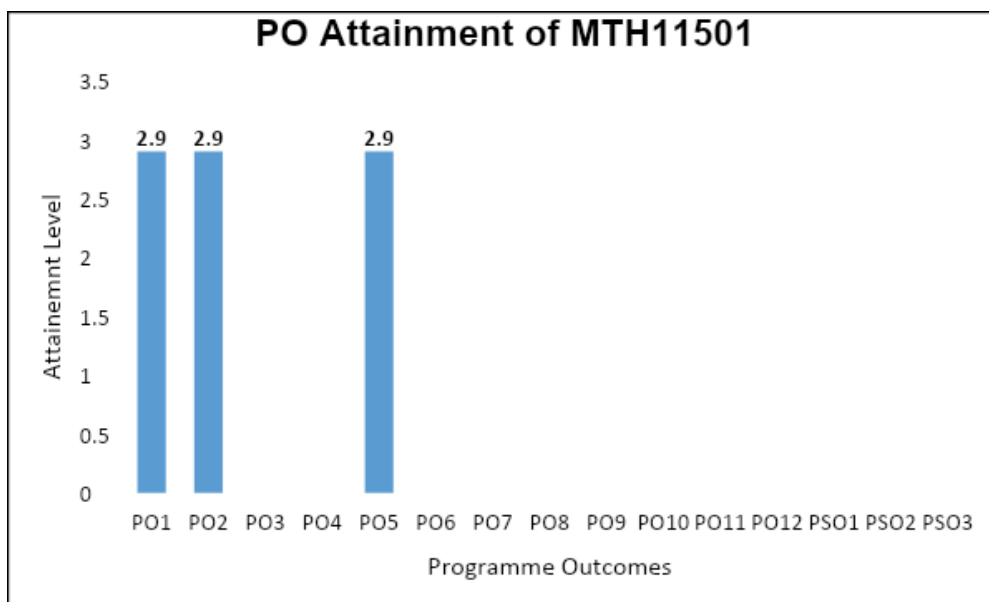
6. Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh   Course Code: MTH11501

7. Course   : Engineering Mathematics-I   L: 3

8. Program   : B.Tech   T: 1

9. Target   : 60%   P: 0

C: 4

PO ATTAINMENT OF THE COURSE

PO Attainment of MTH11501

Signature of HOD/Dean   **Signature of Faculty**

Date: **Date: 07.04.2021**

6.   **Name of the Faculty: Dr. Supriyo Mazumder & Dr. Aditya Ghosh**   **Course Code: MTH11501**

7.   **Course**   **: Engineering Mathematics-I**   **L: 3**

8.   **Program**   **: B.Tech**   **T: 1**

9.   **Target**   **: 60%**   **P: 0**

                                                                                             C: 4

INSTRUCTIONS FOR FACULTY

Instructions for Faculty

- Faculty should keep track of the students with low attendance and counsel them regularly.
- Course coordinator will arrange to communicate the short attendance (as per University policy) cases to the students and their parents monthly.
- Topics covered in each class should be recorded in the table of RECORD OF CLASS TEACHING (Suggested Format).
- Internal assessment marks should be communicated to the students twice in a semester.
- The file will be audited by respective Academic Monitoring and Review Committee (AMRC) members for theory as well as for lab as per AMRC schedule.
- The faculty is required to maintain these files for a period of at least three years.
- This register should be handed over to the head of department, whenever the faculty member goes on long leave or leaves the Colleges/University.
- For labs, continuous evaluation format (break-up given in the guidelines for result preparation in the same file) should be followed.
- Department should monitor the actual execution of the components of continuous lab evaluation regularly.
- Instructor should maintain record of experiments conducted by the students in the lab weekly.
- Instructor should promote students for self-study and to make concept diary, due weightage in the internal should be given under faculty assessment for the same.
- Course outcome assessment: To assess the fulfilment of course outcomes two different approaches have been decided. Degree of fulfillment of course outcomes will be assessed in different ways through direct assessment and indirect assessment. In Direct Assessment, it is measured through quizzes, tests, assignment, Mid-term and/or End-term examinations. It is suggested that each examination is designed in such a way that it can address one or two outcomes (depending upon the course completion). Indirect assessment is done through the student survey which needs to be designed by the faculty (sample format is given below) and it shall be conducted towards the end of course completion. The evaluation of the achievement of the Course Outcomes shall be done by analyzing the inputs received through Direct and Indirect Assessments and then corrective actions suggested for further improvement.
- **Submission Targets of Course Contents:**
    - o   **S. No. 1 to 8   : Before Starting the Course**
    - o   **S. No. 9 & 10   : After Mid Semester Examination**
    - o   **S. No. 11 to 18 : Immediately After End Semester Examination**
    - o   **S. No. 19 to 23 : After Declaration of Result of the Course**