

**INTERNAL ASSIGNMENT QUESTIONS
M.Sc. (MATHEMATICS) FINAL
YEAR WISE (OLD PATTERN) BACKLOG**

2025



PROF. G. RAM REDDY CENTRE FOR DISTANCE EDUCATION

(RECOGNISED BY THE DISTANCE EDUCATION BUREAU, UGC, NEW DELHI)

OSMANIA UNIVERSITY

(A University with Potential for Excellence and Re-Accredited by NAAC with "A" + Grade)

DIRECTOR

Prof. G.B. Reddy

Hyderabad – 7 Telangana State

Dear Students,

Every student of M.Sc. Mathematics Final Year (Year wise) has to write and submit **Assignment** for each paper compulsorily. Each assignment carries **20 marks**. The marks awarded to the students will be forwarded to the Examination Branch, OU for inclusion in the marks memo. If the student fail to submit Internal Assignments before the stipulated date, the internal marks will not be added in the final marks memo under any circumstances. The assignments will not be accepted after the stipulated date. **Candidates should submit assignments only in the academic year in which the examination fee is paid for the examination for the first time.**

Candidates are required to submit the Exam fee receipt along with the assignment answers scripts at the concerned counter on or before **15-04-2025** and obtain proper submission receipt.

ASSIGNMENT WITHOUT EXAMINATION FEE PAYMENT RECEIPT (ONLINE) WILL NOT BE ACCEPTED

Assignments on Printed / Photocopy / Typed will not be accepted and will not be valued at any cost. Only HAND WRITTEN ASSIGNMENTS will be accepted and valued.

Students are advised not use Black Pen.

Methodology for writing the Assignments (Instructions) :

1. First read the subject matter in the course material that is supplied to you.
2. If possible read the subject matter in the books suggested for further reading.
3. You are welcome to use the PGRRCDE Library on all working days for collecting information on the topic of your assignments. (10.30 am to 5.00 pm).
4. Give a final reading to the answer you have written and see whether you can delete unimportant or repetitive words.
5. The cover page of the each theory assignments must have information as given in FORMAT below.

FORMAT

1. NAME OF THE STUDENT :
2. ENROLLMENT NUMBER :
3. NAME OF THE COURSE :
4. NAME OF THE PAPER :
5. DATE OF SUBMISSION :
6. Write the above said details clearly on every subject assignments paper, otherwise your paper will not be valued.
7. Tag all the assignments paper wise and submit them in the concerned counter.
8. Submit the assignments on or before **15-04-2025** at the concerned counter at PGRRCDE, OU on any working day and obtain receipt.

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Prof G Ram Reddy Centre for Distance Education
Osmania University, Hyderabad-7

Internal Assignment Question Paper (2020-21)

Course: **M. Sc. Mathematics Final Year**

Paper-I: Complex Analysis

Section-A

Unit-I: Answer the following short questions. Each question carries 2 marks. (5x2=10 Marks)

1. If $f = u + iv$ is analytic, then prove that u and v are harmonic.
2. Define limit superior and limit inferior of a sequence of real numbers.
3. Find $f = u + iv$ analytic given that $u = x^3 - 3xy^2 + 2x$.
4. If u is harmonic, then prove that $\frac{\partial^2 u}{\partial z \partial \bar{z}} = 0$.
5. If $f = u + iv$ is analytic and $|f(z)|$ is constant, then prove that f is constant.

Section-B

Unit-II: Answer the following questions. Each question carries 5 marks. (2x5=10 Marks)

6. State and prove Liouville's theorem and hence deduce the fundamental theorem of algebra.
7. State and prove Cauchy's integral formula.

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INTERNAL ASSIGNMENT QUESTION PAPER

Course : M.A., M.Com., M.Sc.

Paper : II Title : Measure theory Year: Previous / Final

Section - A

UNIT - I : Answer the following short questions (each question carries two marks) 5x2=10

- 1 Prove that outer measure of an interval is its length.
- 2 Prove that every Borel set is measurable.
- 3 State and Prove Little wood's first Principle.
- 4 State and Prove Bounded Convergence theorem.
- 5 State and Prove Holder and Minkowski's inequalities

Section - B

UNIT - II : Answer the following Questions (each question carries Five marks) 2x5=10

1. State and Prove Vitali Covering Lemma.
2. State and Prove Jordan decomposition theorem.
3. State and Prove Radon nikodg theorem.

Name of the Faculty : S. V. S. Reddy

Dept. Mathematics

INTERNAL ASSIGNMENT QUESTION PAPER:

COURSE : M.Sc : Year : FINAL

Paper : 3. Title : Operations Research & Numerical Techniques

Section : A

UNIT: I: Answer the following short questions (each question carries two marks) $5 \times 2 = 10$.

1. Define i) Slack variable ii) Surplus Variable iii) Artificial variable.
2. State and prove Reduction Theorem in Assignment Problems
3. Write the Working Rule for Vogel's Approximation Method in Transportation Problem.
4. Define i) Total float ii) Free float iii) Independent float.
5. Show that the Newton Raphson Method is quadratic convergence.

Section : B

UNIT: II: Answer the following Questions. (Each question carries two marks) $2 \times 5 = 10$

1. Solve the following LPD by Simplex Method

$$\text{Max } Z = 5x_1 + 3x_2$$

$$\text{STC } 3x_1 + 5x_2 \leq 15$$

$$5x_1 + 2x_2 \leq 10$$

$$x_1, x_2 \geq 0$$

2. Solve the following system of equations by Gauss Elimination Method

$$4x_1 + x_2 + x_3 = 4$$

$$x_1 + 4x_2 - 2x_3 = 4$$

$$3x_1 + 2x_2 - 4x_3 = 6$$

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INTERNAL ASSIGNMENT QUESTION PAPER-

COURSE: M.Sc (final)

SUBJECT: FLUID MECHANICS.

SECTION – A

UNIT- I : Answer the following short questions (each question carries two marks)
5*2 = 10

- 1.) Derive conservation law for linear momentum of a system of particles.
- 2.) Derive conservation law for angular momentum of a system of particles.
- 3.) Define centre of mass of a rigid body. Find centre of mass of hemispherical shell of radius 'a'.
- 4.) State and prove the parallel axis theorem and the perpendicular axis theorem.
- 5.) Derive gradient , divergence and curl operators in cylindrical coordinates.

SECTION B

UNIT – II (2*5 = 10)

- 1.) Derive the equation of continuity and Euler's equation of motion in vector form.
- 2.) Discuss the motion of a liquid between two coaxial cylinders.

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INTERNAL ASSIGNMENT QUESTION PAPER

Course: M.Sc.(Mathematics)

Paper : V

Title: **Integral Transforms, Integral Equations and Calculus of Variations**

Year: **Final**

Section-A

5×2=10

Answer the following questions(each question carries Two marks).

1. Find $L\left\{\frac{\sin t}{t}\right\}$

2. Find the Fourier transform of $f(x) = e^{-x}$.

3. Find the Fourier cosine transform of $f(x) = \sin x$.

4. Solve $\varphi(x) = e^x + \int_0^x e^{x-t} \varphi(t) dt$.

5. Solve $\varphi(x) = 2x - \pi + 4 \int_0^{\frac{\pi}{2}} \sin^2 x \varphi(t) dt$.

Section-B

2×5=10

Answer the following questions(each question carries Five marks)

1. Solve the boundary value problem $y'' + y = x, y(0) = y\left(\frac{\pi}{2}\right) = 0$ using Green's function.

2. Derive Hamilton's equations of motion.

Name of the Faculty : Prof.V.NAGARAJU

Dept. of Mathematics