

# **INTERNAL ASSIGNMENT QUESTIONS M.Sc. (MATHEMATICS) FINAL**

**2024**



**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 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 **30-04-2024** 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.**

**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 **30-04-2024** at the concerned counter at PGRRCDE, OU on any working day and obtain receipt.

  
**DIRECTOR**

INTERNAL ASSIGNMENT QUESTION PAPER - 2023 - 2024

Course M.Sc. (Mathematics)

Paper : I Title : Complex Analysis Year : Final

Section - A

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

- 1 Show that  $z$  and  $z'$  correspond to diametrically opposite points of the Riemann sphere if and only if  $z \bar{z}' = 1$
- 2 For what values of  $z$  is  $\sum_{n=0}^{\infty} \left(\frac{z}{1+z}\right)^n$  convergent
- 3 Find the real and imaginary parts of  $e^z$
- 4 Find  $\oint_{|z|=2} \frac{dz}{z^2-1}$
- 5 Define 1) Morera's Theorem 2) Liouville's Theorem  
3) Fundamental Theorem of Algebra

Section - B

UNIT - II : Answer the following Questions (each question carries Five marks)  $2 \times 5 = 10$

1. state and prove Weierstrass M-Test.
2. state and prove Cauchy's Integral Formula.

 17/2/24

Name of the Faculty :

Dr. K. Ramesh Babu

Dept. of Mathematics

INTERNAL ASSIGNMENT QUESTION PAPER - 2023 - 2024

Course M.Sc. (Mathematics)

Paper : II Title : Measure Theory Year : Final ✓

Section - A

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

- 1 Prove that outer measure of an interval is its length.
- 2 State and Prove Bounded Convergence Theorem
- 3 State and Prove Egoroff's theorem
- 4 State and Prove Holder's and Minkowski's Inequalities
- 5 (State and Prove Jordan decomposition theorem);  
State and Prove Riesz Fisher theorem.

Section - B

UNIT - II : Answer the following Questions (each question carries Five marks)  $2 \times 5 = 10$

1. State and Prove Vitali Covering Lemma  
(a)  
(b) State and Prove Hahn decomposition theorem.
2. (a) State and Prove Radon Nikodym theorem  
(b) State and Prove Jordan decomposition theorem.

Name of the Faculty : D.V. SRINIVAS

Dept. Mathematics

INTERNAL ASSIGNMENT QUESTION PAPER - 2023 - 2024

Course M.Sc. (Mathematics)

Paper: III Title: Operations Research and Numerical Techniques. Year: Final

Section - A

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

- ① Solve the following LPP graphically  
 $\text{Max } Z = 100x_1 + 50x_2$  s.t.c:  $4x_1 + 6x_2 \leq 24, x_1 \leq 4, x_2 \leq 4/3, x_1, x_2 \geq 0$
- ② Explain the steps for Vogel's Approximation Method in T.P.
- ③ Explain the concept of Dominance in Games Theory.
- ④ Find a real root of the equation  $x^3 - x - 1$  by Newton Raphson Method correct to 4 decimal places.
- ⑤ Using Simpson's  $\frac{1}{3}$  rule, evaluate  $\int_0^{\pi/2} \sin x dx$  (4 intervals)

Section - B

UNIT - II : Answer the following Questions (each question carries Five marks)  $2 \times 5 = 10$

- ① Use Runge-Kutta method to approximate  $y$ , when  $x=0.1$  &  $x=0.2$  given that  $x=0, y=1$  and  $\frac{dy}{dx} = x+y$ .
- ② Solve the following Assignment Problem

	I	II	III	IV	V
A	2	9	2	7	1
B	6	8	7	6	1
C	4	6	5	3	1
D	4	2	7	3	1
E	5	3	9	5	1

Dr. J. G. Shyam Sunder  
Name of the Faculty:

Dept. Mathematics

PROF.G. RAM REDDY CENTRE FOR DISTANCE EDUCATION

OSMANIA UNIVERSITY, HYDERABAD, 500007

INTERNAL ASSIGNMENT QUESTION PAPER (FEB-2024)

COURSE: M.Sc -MATHEMATICS , YEAR-FINAL, PAER-IV

SUBJECT: FLUID MECHANICS.

SECTION – A

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

1. Find center of mass a solid uniform right circular cone of height 'b'.
2. Find moment of inertia of a thin spherical shell of radius 'a' about any diameter.
3. Derive gradient , divergence and curl operators in orthogonal curvilinear coordinates and express these in cylindrical and spherical coordinates.
4. Derive equation of continuity in vector form.
5. Explain about source, sink and doublet.

SECTION B (2\*5 = 10)

1. Define stress, strain and derive the relation between stress and rates of strain.
2. Explain flow between two parallel plates and plane coquette flow and Poiseuille flow.

AVLamul  
(Prof. A. Venkata Lakshmi)  
Dept of Mathematics

**PROF.G.RAM REDDY CENTRE FOR DISTANCE EDUCATION**

**OSMANIA UNIVERSITY, HYDERABAD-500 007**

**INTERNAL ASSIGNMENT QUESTION PAPER(2023-24)**

**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 i)  $\int_0^{\infty} \frac{e^{-2t} - e^{-3t}}{t} dt$  ii)  $L^{-1} \left\{ \frac{p^2}{(p^2 + a^2)(p^2 + b^2)} \right\}$  iii)  $L \left\{ \frac{\sinh t}{t} \right\}$

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

3. Find the Fourier sine and cosine transforms of  $f(x) = 2e^{-x} + 6e^{-2x}$ .

4. Solve  $\varphi(x) = \sin x + 2 \int_0^x e^{x-t} \varphi(t) dt$  using resolvent kernel.

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. State and prove convolution theorem for Laplace transforms and Fourier transforms.

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

Name of the Faculty : Prof.V.NAGARAJU

Dept. of Mathematics