INTERNAL ASSIGNMENT QUESTIONS
M.Sc (MATHEMATICS) FINAL

2022

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 you will be forwarded to the Controller of Examination, OU for inclusion in the University Examination marks. The candidates have to pay the examination fee and submit the Internal Assignment in the same academic year. If a candidate fails to submit the Internal Assignment after payment of the examination fee he will not be given an opportunity to submit the Internal Assignment afterwards, if you fail to submit Internal Assignments before the stipulated date the Internal marks will not be added to University examination marks under any circumstances.

You are required to **pay Rs.300/-** towards the Internal Assignment Fee through Online along with Examination fee and submit the Internal Assignments along with the Fee payment receipt at the concerned counter.

ASSIGNMENT WITHOUT THE FEE RECEIPT WILL NOT BE ACCEPTED

Assignments on Printed / Photocopy / Typed papers 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:

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 including Sunday 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 COURSE   :
    2. NAME OF THE STUDENT   :
    3. ENROLLMENT NUMBER   :
    4. NAME OF THE PAPER   :
    5. DATE OF SUBMISSION   :

6. Write the above said details clearly on every assignments paper, otherwise your paper will not be valued.

7. Tag all the assignments paper-wise and submit

8. Submit the assignments on or before **20th July, 2022** at the concerned counter at PGRRCDE, OU on any working day and obtain receipt.

DIRECTOR

M.Sc. (Mathematics) (FINAL)

INTERNAL ASSIGNMENT

Paper – II : MEASURE THEORY

SECTION – A

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

1. Prove that the outer measure of an internal is it's length.

2. Prove that the class of Measurable sets is a – algebra.

3. State and prove Bounded Convergence Theorem.

4. State and prove Monotone Convergence Theorem.

5. State and prove Jordan decomposition Theorem.

SECTION – B

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

1. State and prove Holder and Minkowski's inequalities.

2. a)   State and prove Riesz-Fisher Theorem.
   b)   State and prove Random Nikodya Theorem.

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OSMANIA UNIVERSITY, HYDERABAD–500 007

INTERNAL ASSIGNMENT QUESTION PAPER - 2021 - 2022

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

Paper : __I__   Title : __Complex Analysis__   Year: ~~Previous~~ / Final

Date : 16.5.22

Section – A

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

1. Show that Z and Z' to diametrically opposite points of the Riemann Sphere iff $z \bar{z}' = 1$

2. State and Prove Abel's Theorem

3. Find the real and imaginary points of $\sin Z$

4. Find $\int_{\gamma} |z-1| |dz|$, where γ is the positively oriented circle $|z| = 1$

5. Evaluate $\int_0^\infty \dfrac{x^{1/3}}{1+x^2} dx$

Section – B

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

1. State and Prove Cauchy's Integral Formula

2. State and Prove Cauchy's residue Theorem

Name of the Faculty : Dr. K. Ramesh Babu

Dept. of Mathematics

Paper – I

M.Sc Programme

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OSMANIA UNIVERSITY, HYDERABAD–500 007

INTERNAL ASSIGNMENT QUESTION PAPER - 2021 - 2022

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 The outer measure of an interval is it's length.

2 Prove That The class of Measurable Sets is σ-algebra

3 State and Prove Bounded Convergence Theorem

4 State and Prove Monotone Convergence Theorem

5 State and Prove Jordan decomposition Theorem

Section – B

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

1. State and Prove Holder and Minkowski's Inequalities

2. State and Prove Riesz - Fisher Theorem

3. State and Prove Radon Nikodym Theorem

Dr. V.SRIniVas
Name of the Faculty :

Dept. _Mathematics_

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INTERNAL ASSIGNMENT QUESTION PAPER - 2021 - 2022

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

Paper : __II__   Title : __O.R & N.T__   Year: ~~Previous~~ / Final

Section – A

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

1. Define i) Slack Variable ii) Surplus Variable iii) Artificial variable.

2. Write the working rule for Vogel's Approximation Method.

3. Write the concept of Dominance in Game Theory.

4. Find a real root of the equation $x^3 - 5x + 3 = 0$ by Bisection Method.

5. Using Simpson's rule, evaluate $\int_0^{\pi/2} \sqrt{\sin\theta}\, d\theta$.

Section – B

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

1. Solve the following LPP by Simplex Method
$$\text{Max } z = 5x_1 + 3x_2 \quad \text{STC} \quad 3x_1 + 5x_2 \le 15, \quad 5x_1 + 2x_2 \le 10, \quad x_1, x_2 \geq 0$$

2. Use Runge-Kutta Method to approximate y, when $x = 0.1$ and $x = 0.2$ gives that $x = 0, y = 1$, & $\frac{dy}{dx} = x + y$.

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

Dept. 29.5.2022

INTERNAL ASSIGNMENT QUESTION PAPER- 2021-2022

M.Sc (final) , PAPER-IV, 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 and angular momentum of a system of particles.
2.) Explain about boundary surface and derive required condition for F(r,t)=0 to be a boundary surface.
3.) Discuss motion of a cylinder in a uniform motion.
4.) Explain about vertex motion.
5.) Explain about orthogonal curvilinear coordinates. Derive gradient , divergence and curl operators in orthogonal curvilinear coordinates.

SECTION B

UNIT – II (2*5 = 10)

1.) Derive the equation of continuity and Euler's equation of motion in vector form and write in cylindrical coordinates.
2.) Explain about the dynamical similarity and Reynold's number,froude number,Euler number,mach number, Prandtl number.

Av(Gaull
14-05-2022

(Dr . A -Venkata lakshmi)

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INTERNAL ASSIGNMENT QUESTION PAPER(2021-22)

Course: M.Sc.(Mathematics)

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

Year: **Final**

Section-A

Answer the following questions(each question carries Two marks)   **5×2=10**

1. Find i) $L\{e^{-t} t \cos t\}$ ii) $L^{-1}\left\{\dfrac{1}{p^3(p+1)}\right\}$.

2. Find the finite Fourier cosine transforms of $f(x) = \left(1 - \dfrac{x}{\pi}\right)^2$.

3. Using the method of successive approximations, solve $\varphi(x) = 1 + x + \int\limits_0^x \varphi(t)\,dt,\ \varphi(x_0) = 0.$

4. Evaluate $\int\limits_0^\infty e^{-x^2}\,dx$ using Gamma function.

5. Solve $\varphi(x) = 2\int\limits_0^1 xt\,\varphi^3(t)\,dt$.

Section-B

Answer the following questions(each question carries Five marks)   **2×5=10**

1. State and prove convolution theorem for Fourier transforms.

2. Construct the Green's function for the boundary value problem
$y^{iv} = 0, y(0) = y'(0) = y''(1) = y'''(1) = 0$.

Name of the Faculty : Dr.V.NAGARAJU

Dept. of Mathematics