

INTERNAL ASSIGNMENT QUESTIONS

M.Sc. (Mathematics) SEMESTER III

2026



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. N. Ch. Bhattacharylu
Hyderabad – 7 Telangana State

**PROF.G.RAM REDDY CENTRE FOR DISTANCE EDUCATION
OSMANIA UNIVERSITY, HYDERABAD – 500 007**

Dear Students,

Each student has to write the answers to the Assignment questions with neat own handwriting using Blue Pen (Black Ink not allowed) for each paper. Assignments have to submit after the payment of Rs.500/- by showing the receipt of the same. If the Assignment is not submitted within stipulated time i.e. before the theory exams / last date is treated as absent.

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 PGRRUDE 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. SEMESTER (I, II, III & IV) :
5. TITLE OF THE PAPER :
6. 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 **27.07.2026.** at the concerned counter at PGRRUDE, OU on any working day and obtain receipt.

Note : Write the Answers in A4 size white papers with Blue ink / ball point pen only

DIRECTOR

INTERNAL ASSIGNMENT QUESTION PAPER

COURSE : M.Sc. Mathematics - III Semester

Paper : I Subject : Topology

Total Marks: 30

Section - A

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

- ① prove that let (X, τ) be a topological space and $A \subset X$, then $\bar{A} = \{x \in X : \text{each neighbourhood of } x \text{ intersects } A\}$
- ② prove that Every subspace of a second countable space is second countable
- ③ Show that Any continuous image of a compact space is compact
- ④ Show that Every subspace of a T_1 -space is a T_1 -space
- ⑤ Show that Any continuous image of a connected space is connected.

Section - B

UNIT - II : Answer the following Questions (each question carries ten marks) $2 \times 10 = 20$

- ① State and prove Kuratowski closure axioms
- ② State and prove Urysohn's Lemma.

Name of the Faculty : Dr. A. Srisaibam

Dept. of Mathematics
O.U.C.S

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INTERNAL ASSIGNMENT QUESTION PAPER– 2025-26

Course M.Sc. (Mathematics) III Semester

Paper : II

Subject : Linear Algebra.

Total Marks: 30

Section – A

UNIT– I : Answer the following short questions

(each question carries two marks)

5x2 =10

1) Find the minimal polynomial of $A = \begin{bmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix}$.

2) If N is nilpotent on an n – dimensional vector space V ,
then the characteristic polynomial for N is x^n .

3) If A is a 5×5 matrix with 4 as the only characteristic root,
then find all possible Jordan canonical forms?

4)(i) Define Symmetric Bilinear form & prove that f is symmetric $\Leftrightarrow A^t = A$
Skew Symmetric Bilinear form & prove that f is Skew symmetric $\Leftrightarrow A^t = -A$
(ii) State and prove that Polarization identity.

5) Define E is a projection operator on V . and Let E be a projection on V ,
then Prove that (i) $\beta \in R(E) \Leftrightarrow E\beta = \beta$ (ii) $V = R \oplus N$

Section -B

UNIT– II Answer the following Long questions

(each question ten marks)

2x10= 20

1). (i) State and Prove that Primary Decomposition Theorem.

(ii) Using primary decomposition theorem, express $T = \begin{bmatrix} 5 & -6 & -6 \\ 1 & 4 & 2 \\ 3 & -6 & -4 \end{bmatrix}$

as $T = D + N$, where D is diagonal part, N is nilpotent part.

2). (i) State and prove that Generalized Cayley Hamilton Theorem.

(ii) Let V be a f.d.v.s over a field of characteristic zero and Let f be symmetric bilinear form on
Then there is a basis for V in which f is represented by a diagonal matrix.

Name of the Faculty: V. Venkateshwarlu
Department: Mathematics

INTERNAL ASSIGNMENT QUESTION PAPER

COURSE : M.Sc. Mathematics - III Semester

Paper : III

Subject : Operations Research

Total Marks: 30

Section - A

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

- 1 Define i) Slack, Surplus, artificial variables & degeneracy in LPP.
- 2 Use Simplex Method to obtain the inverse of the matrix $A = \begin{bmatrix} 3 & 2 \\ 4 & -1 \end{bmatrix}$
- 3 write the steps of Modi Method.
- 4 Explain about Travelling Salesman Problem.
- 5 Define Bellman's principle of optimality & characteristics of Dynamic Programming.

Section - B

UNIT - II : Answer the following Questions (each question carries ten marks)

$2 \times 10 = 20$

- 1 Solve the LPP by Simplex Method :

$$\begin{aligned} \text{Min } Z &= 3x_1 + 5x_2 + 4x_3 \\ \text{STC } 2x_1 + 3x_2 &\leq 8 \\ 2x_2 + 5x_3 &\leq 10 \\ 3x_1 + 2x_2 + 4x_3 &\leq 15 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$
- 2 Solve the following Assignment Problem

Salesmen

	Destinations				
	A	B	C	D	E
1	32	38	40	28	40
2	40	24	28	21	36
3	41	27	33	30	37
4	22	38	41	36	36
5	29	33	40	35	39

Dr. J. G. Suman Kumar
Name of the Faculty :

Dept. Mathematics

INTERNAL ASSIGNMENT QUESTION PAPER

COURSE : M.Sc. Mathematics - III Semester

Paper : IV Subject : Mechanics

Total Marks: 30

Section - A

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

1. Define Elastic Body and rigid body with Example.
2. Moments and products of Inertia write complete DISCUSS
3. Rotational Kinetic Energy of a rigid Body.
Describe about
↳ Lagrange's Equation & Hamilton's Equations.
5. Define D'Alembert's principle & Ignorable Co-ordinates.

Section - B

UNIT - II : Answer the following Questions (each question carries ten marks) $2 \times 10 = 20$

1. Body Rolling Down on an Inclined plane (1) motion with Slipping.
(2) motion with no Slipping.
2. Perpendicular Axis Theorem and parallel Axis Theorem
State and prove.

Name of the Faculty : Dr Eka Srinivas

Dept. Mathematics.