International Institute of Information Technology, Hyderabad

(Deemed to be University)

Course Code: MA2.101:
LINEAR ALGEBRA
Tutorial Quiz Examination

Max. Time: 40 min **Max. Marks: 25**

Roll No: [redacted] **Programme:** [redacted] **Date of Exam:**______

[redacted] **Invigilator's Signature:**

General Instructions to the students

1. Place your Permanent / Temporary Student ID card on the desk during the examination for verification by the Invigilator.
2. Reading material such as books (unless open book exam) are not allowed inside the examination hall.
3. Borrowing writing material or calculators from other students in the examination hall is prohibited.
4. If any student is found indulging in malpractice or copying in the examination hall, the student will be given 'F' grade for the course and may be debarred from writing other examinations.
5. No extra pages will be given

Best of Luck

SECTION: A

1. Prove that $\|u+v\|=\|u-v\|$ if and only if u and v are orthogonal to each other.
2. Show that $\| u+v\|^2=\|u\|^2 +\| v\|^2 +2 <u,v>$
3. Show that $<u+v,u-v>= \|u\|^2-\| v\|^2$.
4. Show that $d(u,v)= \sqrt{\|u\|^2+\|v\|^2}$ if and only if u and v are orthogonal to each other.
5. Prove that $\|u\|^2 +\| v\|^2=(1/2)\| u+v\|^2+(1/2)\| u-v\|^2$ **[2+2+2+2+2=10]**

[Here $<u,v>$]

SECTION: B

1. Use Gauss Jordan Method to find the inverse of the matrix

$$\begin{pmatrix} 0 & -1 & 1 & 0 \\ 2 & 1 & 0 & 2 \\ 1 & -1 & 3 & 0 \\ 0 & 1 & 1 & -1 \end{pmatrix}$$

[

2. Using induction, prove that for all $n\geq 1$, $(A_1+A_2+....+A_n)^T= A_1^T+A_2^T+....+A_n^T$
3. Express M= $\begin{pmatrix} b & c \\ 1 & 0 \end{pmatrix}, (b\neq 0, c\neq 0)$ as a product of elementary matrices

[5+5+5=15]

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