2 3 SEP 2019

B.Sc. SEMESTER-IV EXAMINATION:

PAPER NO.:MAT-CC-404 CODE NO:21017/21038

LINEAR ALGEBRA II AND NUMERICAL ANALYSIS II

TIME:2 :30HOURS TOTAL MARKS:70

INSTRUCTIONS (1)ALL QUESTIONS ARE COMPULSORY.

(2)EACH QUESTION CARRY EQUAL MARKS.

Q.1 A Let T: $R^2 \to R^2$; T(x,y) = (x ,-y); $\forall$ (x,y) $\in R^2$ and $B_1 = \{(1,1),(1,0)\}$ & $B_2 = \{(2,3),(4,5)\}$ then find $[T; B_1, B_2]$ [7]

B Prove that Vector space L(U, V) and $\mathcal{M}_{mn}$ are isomorphic to each other. [7]

OR

Q.1 A Let T: $R^2 \to R^2$; T(x,y) = (x ,-y); $\forall$ (x,y) $\in R^2$ and Let $B_1 = \{(1,0),(0,1)\}$ & $B_2 = \{1,1),(1,-1)\}$ be two basis of R^2 Then ,find $[T; B_1, B_2]$. [7]

B Obtain linear transformation associated with a matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$. [7]

Q.2 A Prove that parallelogram is rhombs if and only if the diagonal are perpendicular to each other using inner product space. [7]

B State and prove Schwartz's inequality. [7]

OR

Q.2 A State and prove Riesz representation theorem. [7]

B T: V→V be a linear function then T is orthogonal iff $\|T(X)\| = \|X\|$ [7]

Q.3 A Prove that , the divided difference are symmetrical in all their arguments. [7]

B Derive: Differentiation formula based on stirling formula. [7]

OR

Q.3 A Derive : Laplace Everett's interpolation formula [7]

B Find the polynomial which assume the values -5,-3,-1,7 when x has values 0,1,2,3 by Lagrange's interpolation formula. [7]

Q.4 A Derive : General Quadrature Formula. [7]

B Prove that $Q_{31}(1) = \frac{h}{24}\{-1,13,13,-1\}$ [7]

OR

Q.4 A Derive : Simpson's $\frac{1}{3}^{rd}$ rule. [7]

B Find the approximate value of $\int_0^{\frac{\pi}{2}} \sin\theta \, d\theta$ by dividing the interval into six equal parts by Weddle's Rule [7]

Q.5 A Discuss: Bisection method. [7]

B Discuss: Picard's method. [7]

OR

Q.5 A Discuss : Iteration method . [7]

B Discuss : Euler's modified method. [7]