Set-A
P/C

P.S.SCIENCE & H.D.PATEL ARTS COLLEGE, KADI
INTERNAL EXAMINATION

B.Sc. Sem - IV [Marks 40

07/03/2018 Mathematics 402 [1.45 to 3.45

Que 1: Attempt any two.

a) Explain matrix associate with a linear transformation.

b) Solve the system of equations by Echelon method.
$x_1+2x_2-x_3-2x_4= 0$; $2x_1+4x_2+2x_3+4x_4= 4$; $3x_1-6x_2-3x_3+6x_4= 6$

c) Let T: $R^3 \rightarrow R^2$ be a linear transformation defined by T(a,b,c) = (a+b,b+c), where
B_1= {(,1,1,0),(2,1,0),(0,0,1)} and
B_2= {(1,1),(2,3)} are the ordered basis of R^3 and R^2 respectively. Find [T: B_1, B_2].

Que 2: Attempt any two.

a) State and prove the triangular inequality in an inner product space.

b) For a linear map T: $R^2 \rightarrow R^2$,
$T(\alpha,\beta) = (\alpha + 5\beta, 3\alpha + \beta)$, find T^*.

c) Using Gram-Schmidt process obtain the orthonormal basis from the basis {(0,0,2),(2,1,0),(-1,2,1)}.

Que 3: Attempt any two.

a) Define : Eigen value , Eigen vector

b) Find the eigen values and corresponding eigen vectors of the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

c) Using Cayley-Hamilton theorem find the inverse of $\begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$

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