QUESTION BANK OF ALGEBRA

(B.A-1, B.SC-1)

ASSINGMENT-2

21.Determine whether the following matrices have the same row space

$P = \begin{bmatrix} 1 & -1 & -2 \\ -3 & 2 & 3 \end{bmatrix}$, $Q = \begin{bmatrix} 1 & 1 & 5 \\ 4 & 6 & 26 \end{bmatrix}$

22.State the condition under which a system of non homogeneous eqn. will have ; (a) a unique (b) infinite (c) no solution.

23. Show that the only real value of k for which the following eqns have non zero or non trivial or non zero or at least one non zero solution is 6;

X+2y+3z =kx, 3x+y+2z=ky , 2x+3y+z=kz.

24.Discuss for all values of k, the system of eqns. 2x + 3ky + (3k+4)z =0 , x + (k +4)y + (4k +2)z = 0 , x +2 (k+1)y + (3k+4)z =0

25. Solve completely or find basis and solution space of the system of linear eqns. X + 2y +2z –s +3t = 0

X + 2y + 3z + s + t = 0

3x + 6y + 8z + s + 5t =0

26.Show that the system of eqns. X + y + z = 4 , 2x + 5y -2z = 3,

X + 7y -7z = -6 are consistent and solve it.

27. Show that eqns. X + 2y – z = 3, 3x –y +2z = 1, 2x -2y +3z =2,

X – y + z = -1 are consistent and solve it.

28.Show that the eqns x – 2y + 3z = 7, 2x + y –z =5 , 3x – y +2z = 12

X + 8y -11z =-11 admit an infinite number of solutions and find them

29.Investigate for what values of a , b the eqns x + y +z = 6,

X + 2y + 3z = 10, x + 2y +az = b , have

(1)Unique (2) infinite number (3) no solution

30. Define eigen values and eigen vectors.

31. Prove that characteristic roots of a hermitian matrix are real.

32.show that at least one eigen value of every singular matrix is zero.

33. Prove that a square matrix A and its transpose A^t have set of eigen values .

34.Define similar matrices and prove that similar matrices have same char. Polynomial and hence same eigen values.

35. Show that the eigen value of a diagonal matrix are just the diagonal elements of the matrix.

36. If λ is eigen value of square matrix A then prove that λ^2 is an eigen value of A^2