Tutorial-7
(Eng. Maths - IV)
(B-Tech. Electrical)

Q.1 Test for consistency the following equations and solve them if consistent.

$x - 2y + 3t = 2$, $2x + y + z + t = -4$, $4x - 3y + z + 7t = 8$

Q.2 Solve the equations

(i) $x + 2y + 3z = 0$, $3x + 4y + 4z = 0$, $7x + 10y + 12z = 0$

(ii) $4x + 2y + z + 3w = 0$, $6x + 3y + 4z + 7w = 0$, $2x + y + w = 0$.

Q.3 For what values of k the equations

$x + y + z = 1$, $2x + y + 4z = k$, $4x + y + 10z = k^2$

have a solution and solve them completely in each case.

Q.4 Test for consistency and solve.

(i) $2x - 3y + 7z = 5$, $3x + y - 3z = 13$, $2x + 19y - 47z = 32$

(ii) $x + 2y + z = 3$, $2x + 3y + 2z = 5$, $3x - 5y + 5z = 2$, $3x + 9y - z = 4$.

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Q.5 Find the values of a and b for which the equations

$$x+ay+z=3,\quad x+2y+2z=b,\quad x+5y+3z=9$$

are consistent. When will these equations have a unique solution?.

Q6 Find the values of λ for which the equations

$$(\lambda-1)x+(3\lambda+1)y+2\lambda z=0$$
$$(\lambda-1)x+(4\lambda-2)y+(\lambda+3)z=0$$
$$2x+(3\lambda+1)y+3(\lambda-1)z=0.$$

are consistent, and find the ratios of x & y & z when λ has the smallest of these values. What happens when λ has the greatest of these values.