Answer Key for Determinants (CM23M120401)

1. (i) 0 (ii) $a^2+b^2+c^2+d^2$ (iii) $(3x+\lambda)\lambda^2$ (iv) $(a-b)(b-c)(c-a)$

(v) $(a+b+c)(a^2+b^2+c^2-ab-bc-ca)$ (vi) $(a+b+c)(a-b)(b-c)(c-a)$

(vii) 0 (viii) $(x+2)(1-x)^2$

2. $k=-1,\frac{1}{2}$ 3. $x=3$ 4. $x=5$

5. $M_{11}=3, M_{12}=0, M_{21}=-4, M_{22}=2$ and $C_{11}=3, C_{12}=0, C_{21}=4, C_{22}=2.$

6. $M_{11}=-17, M_{12}=-13, M_{13}=-7, M_{21}=3, M_{22}=-12, M_{23}=6, M_{31}=-22, M_{32}=7, M_{33}=10$ and

$C_{11}=-17, C_{12}=13, C_{13}=-7, C_{21}=-3, C_{22}=-12, C_{23}=-6, C_{31}=-22, C_{32}=-7, C_{33}=10$

7. $\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$ 8. $Adj.A=\begin{bmatrix} \cos\alpha & \sin\alpha & 0 \\ -\sin\alpha & \cos\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$ 10. $A^{-1}=\begin{bmatrix} -\frac{3}{5} & \frac{2}{5} & \frac{2}{5} \\ \frac{2}{5} & -\frac{3}{5} & \frac{2}{5} \\ \frac{2}{5} & \frac{2}{5} & -\frac{3}{5} \end{bmatrix}$ 11. $A^{-1}=\begin{bmatrix} \frac{1+bc}{a} & -b \\ -c & a \end{bmatrix}$

13. $A^{-1}=\begin{bmatrix} \frac{1+bc}{a} & -b \\ -c & a \end{bmatrix}$ 14. $A^{-1}=\begin{bmatrix} -1 & 1 \\ -2 & \frac{3}{2} \end{bmatrix}$

15. (i) $x=2, y=1, z=3$ (ii) $x=2, y=3, z=5$

(iii) $x=-\frac{16}{14}, y=\frac{20}{14}, z=\frac{38}{14}$ (iv) $x=1, y=1, z=-1$

(v) $x=-2, y=1, z=2$ (vi) $x=1, y=2, z=3$

(vii) $x=1, y=1, z=2$ (viii) $x=3, y=1, z=2$

(ix) $A^{-1}=\begin{bmatrix} -\frac{3}{62} & \frac{9}{62} & \frac{5}{62} \\ \frac{26}{62} & -\frac{16}{62} & -\frac{2}{62} \\ \frac{19}{62} & \frac{5}{62} & -\frac{11}{62} \end{bmatrix}, x=1, y=1, z=1$ (x) $x=0, y=0, z=0$