

Books, watches, notes or cell phones are **not** allowed. The **only** calculators allowed are the Sharp EL-531***. You **must** show all your work, the correct answer is worth 1 mark the remaining marks are given for the work.

Question 1. (5 marks) Find the value(s) of k , if any, for which the following system

$$\begin{cases} (2-k^2)x + (2-k^2)y + z = k \\ kx + y + kz = 4 \\ x + y + z = k \end{cases}$$

has

- exactly one solutions,
- infinitely many solutions,
- no solutions.

Question 2.(5 marks) Find a sequence of elementary row operations that brings $\begin{bmatrix} b_1 + c_1 & b_2 + c_2 & b_3 + c_3 \\ c_1 + a_1 & c_2 + a_2 & c_3 + a_3 \\ a_1 + b_1 & a_2 + b_2 & a_3 + b_3 \end{bmatrix}$ to $\begin{bmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{bmatrix}$.