Homework 2.6.

a) Comparator
b) 4.5V

f) Advantages of a MOSFET are higher input impedance and larger power gain.

Homework 2.7.
a) Comparator.

b) $V_2$ needs to be greater than $V_1$ to give a negative output.

c) (i) When the light level decreases, the resistance level of the LDR increases (LORD).
   (ii) $V_2$ is greater than $V_1$.
   (iii) The output goes positive.
   (iv) The transistor switches on and saturates.
   (v) The relay energises and switches on.

d) The diode is there to protect the transistor from back emf when the relay de-energises.

e) Swap the position of the LDR and $R_1$. 