

## PH3104 class test 2

**Q 1) a)** Consider the CE amplifier circuit shown below with the following circuit parameters

$$R_1 = 10 \text{ k}, \quad R_2 = 3.3 \text{ k}, \quad R_C = R_E = 1 \text{ k}, \quad R_L = 10 \text{ k}$$

and  $V_{CC} = 12 \text{ V}$ . Determine the bias voltages and currents.

**b)** For a typical npn transistor at these bias values, the  $h$  parameters are given by

$$h_{fe} = 200, \quad h_{ie} = 2.2 \text{ k}, \quad h_{oe} = 1.5 \times 10^{-4} \text{ S}, \quad h_{re} = 1.2 \times 10^{-5}$$

Determine the voltage and the current gain for small ac signals for this circuit. Derive any equations you may need.

