

ELE22EMI and ELE22DCT

1999 Examination

SUPPLEMENTARY

FORMULAS

$$N_A = 6.023 \times 10^{23}$$

$$R = \frac{\rho L}{A}$$

$$S = \frac{\Delta R/R}{\Delta L/L}$$

$$S = 1 + 2 \frac{\Delta d/d}{\Delta L/L}$$

$$\frac{E_{out}/E_{in}}{\Delta R/R} = N/4 \quad [\text{if } N \text{ arms contain strain gauges}]$$

$$\Psi = \frac{V_{out}/V_{in}}{\text{Stimulus}}$$

$$\frac{R}{R_0} = 1 + \alpha(T - T_0) \quad [\text{metals, thermocouples, most semiconductors}]$$

$$\frac{R}{R_0} = \exp\left[\beta\left(\frac{1}{T} - \frac{1}{T_0}\right)\right] \quad [\text{ceramic thermistors}]$$

$$\Delta V_{be} = \frac{kT}{q} \ln\left(\frac{I_1}{I_2}\right)$$

$$C = \frac{k\epsilon A}{d}$$