Exam Formula Sheet

You may need to use one or more of the following formulae when answering questions which include calculations.

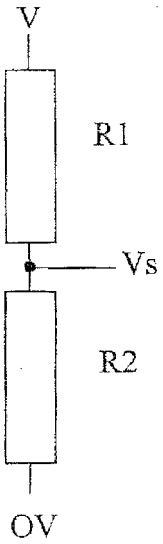
Potential Difference — Potential Difference = Current x Resistance ($V = I \times R$)

Series Resistors — $R_{total} = R1 + R2 + R3$ etc

Parallel Resistors — $$\frac{1}{R_{total}} = \frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3}$$

Electrical Power — Electrical Power = Current x Potential Difference ($P = I \times V$)

Potential Divider



$$V_s = \frac{R2}{R1+R2} \times V$$

where Vs = signal value
V = supply voltage
RI and R2 are resistance values

Inverting Op-Amps — $$\text{Gain} = \frac{-Rf}{Rin}$$ where Rf = feedback resistor value and Rin = input resistor value

Time Constant — Time Constant ≈ Resistance x Capacitance ($T \approx R \times C$)

Astable Frequency for 555 — $$f = \frac{1.44}{(R1 + 2R2) \times C}$$

Pulse duration — $$= \frac{1}{\text{frequency}}$$

Time High — $TH = 0.693 \times (RI+R2) \times C$

Time Low — $TL = 0.693 \times R2 \times C$

Mark Space ratio — $$= \frac{Th}{T1}$$