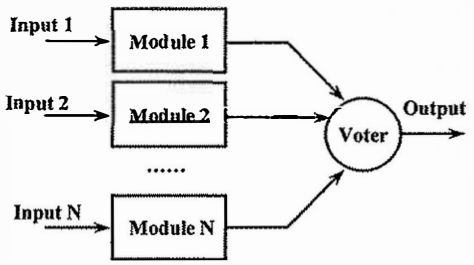
ECE544 L#3 Review Question

Name Solution

- Consider a 7MR design. Assume each module has reliability of 0.7 and the voter has reliability of 0.9.



  - How many module faults can be tolerated by this design? 3 faults
  - What is the reliability of the entire system? 0.7866 (justify your answer below)

$$R_{7MR} = \left(\sum_{i=4}^{7} C_7^i \, p^i (1-p)^{7-i} \right) * w \qquad p = 0.7 \quad w = 0.9$$

$$C_N^i = \frac{N!}{i!(N-i)!}$$

$$= \left[C_7^4 p^4 (1-p)^3 + C_7^5 p^5 (1-p)^2 + C_7^6 p^6 (1-p) + C_7^7 p^7 \right] * w$$

$$= \left[35 * 0.7^4 * 0.3^3 + 21 * 0.7^5 * 0.3^2 + 7 * 0.7^6 * 0.3 + 0.7^7 \right] * 0.9$$

$$= 0.873964 * 0.9$$

$$= 0.786568$$