

22s:39

HW1 Solutions

2-1. Let "a", "b" denote a part above, below the specification

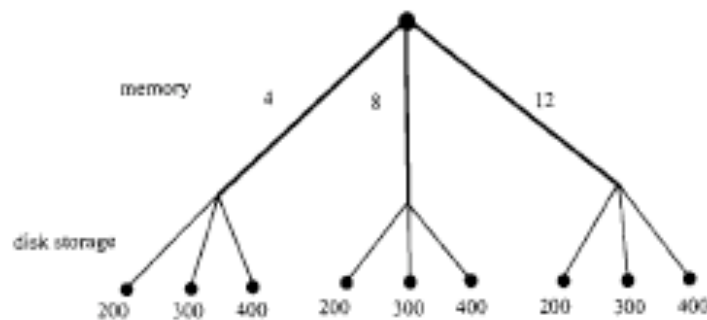
$$S = \{aaa, aab, aba, abb, baa, bab, bba, bbb\}$$

2-2. Let "e" denote a bit in error

Let "o" denote a bit not in error ("o" denotes okay)

$$S = \left\{ \begin{array}{l} eeee, eooo, oeee, oooo, \\ eeeo, eoeo, oeeo, ooee, \\ eooe, eooe, oeeo, oooo, \\ eooo, eooo, oeee, oooo \end{array} \right\}$$

2-16.



2-24

Let  $w$  denote the wavelength. The sample space is  $\{w \mid w = 0, 1, 2, \dots\}$

(a)  $A = \{w \mid w = 675, 676, \dots, 700 \text{ nm}\}$

(b)  $B = \{w \mid w = 450, 451, \dots, 500 \text{ nm}\}$

(c)  $A \cap B = \Phi$

(d)  $A \cup B = \{w \mid w = 450, 451, \dots, 500, 675, 676, \dots, 700 \text{ nm}\}$

2-26.  $A \cap B = 70, A' = 14, A \cup B = 95$

2-35. From the multiplication rule, the answer is  $5 \times 3 \times 4 \times 2 = 120$

2-38 You're looking for number of arrangements, so it's a permutation problem.

$$10! = 3,628,800$$

2-40 There is no difference between the notches, and no difference between the bends.

The number of distinct ways of completely the operation:

$$\frac{7!}{3!4!} = 35 \text{ sequences are possible}$$

2-47. a) The total number of samples possible is  $\binom{24}{4} = \frac{24!}{4!20!} = 10,626$ . The number of samples in which

exactly one tank has high viscosity is  $\binom{6}{1} \binom{18}{3} = \frac{6!}{1!5!} \times \frac{18!}{3!15!} = 4896$ . Therefore, the probability is

$$\frac{4896}{10626} = 0.461$$