

# PR 2

Soal diambil dari buku acuan perkuliahan **Bab 3 nomor 11, 27, 49 dan Bab 4 nomor 51, 67, 75.**

Potret Soal:

**3.11** A shipment of 7 television sets contains 2 defective sets. A hotel makes a random purchase of 3 of the sets. If  $x$  is the number of defective sets purchased by the hotel, find the probability distribution of  $X$ . Express the results graphically as a probability histogram.

**3.27** The time to failure in hours of an important piece of electronic equipment used in a manufactured DVD player has the density function

$$f(x) = \begin{cases} \frac{1}{2000} \exp(-x/2000), & x \geq 0, \\ 0, & x < 0. \end{cases}$$

- (a) Find  $F(x)$ .
- (b) Determine the probability that the component (and thus the DVD player) lasts more than 1000 hours before the component needs to be replaced.
- (c) Determine the probability that the component fails before 2000 hours.

**3.49** Let  $X$  denote the number of times a certain numerical control machine will malfunction: 1, 2, or 3 times on any given day. Let  $Y$  denote the number of times a technician is called on an emergency call. Their joint probability distribution is given as

$f(x, y)$		$x$		
		1	2	3
$y$	1	0.05	0.05	0.10
	3	0.05	0.10	0.35
	5	0.00	0.20	0.10

- (a) Evaluate the marginal distribution of  $X$ .
- (b) Evaluate the marginal distribution of  $Y$ .
- (c) Find  $P(Y = 3 \mid X = 2)$ .

**4.51** For the random variables  $X$  and  $Y$  in Exercise 3.39 on page 105, determine the correlation coefficient between  $X$  and  $Y$ .

**4.67** If the joint density function of  $X$  and  $Y$  is given by

$$f(x, y) = \begin{cases} \frac{2}{7}(x + 2y), & 0 < x < 1, \ 1 < y < 2, \\ 0, & \text{elsewhere,} \end{cases}$$

find the expected value of  $g(X, Y) = \frac{x}{y^3} + X^2Y$ .

**4.75** An electrical firm manufactures a 100-watt light bulb, which, according to specifications written on the package, has a mean life of 900 hours with a standard deviation of 50 hours. At most, what percentage of the bulbs fail to last even 700 hours? Assume that the distribution is symmetric about the mean.