

# EXAM III SOLUTIONS

## Part 1: Multiple Choice (5 points each)

| Test A | Test B |
|--------|--------|
| 1.B    | 1.D    |
| 2.C    | 2.B    |
| 3.B    | 3.A    |
| 4.A    | 4.A    |
| 5.B    | 5.B    |
| 6.D    | 6.A    |
| 7.A    | 7.A    |
| 8.A    | 8.A    |
| 9.B    | 9.B    |
| 10.A   | 10.C   |
| 11.A   | 11.B   |
| 12.A   | 12.A   |
| 13.D   | 13.B   |
| 14.B   | 14.D   |
| 15.A   | 15.A   |
| 16.A   | 16.A   |

## Part 2: Written Answers

(A)

$$b = r \frac{\sigma_y}{\sigma_x} = 0.751 \frac{241.4}{20.85} = 8.695$$

$$a = \bar{y} - b\bar{x} = 441.6 - (8.695)68.36 = -152.79$$

$\hat{y} = -152.79 + 8.695x$  where  $\hat{y}$  is predicted violent crime rate and  $x$  is urbanization %.

(B)

For every 1 % increase in urbanization, the violent crime rate increases by 8.695.

(C)

$$\text{residuals} = y - \hat{y} = 545 - (-152.79 + (8.69)83.2) = -25.218$$

(D)

The regression line overpredicts the violent crime rate for Texas.