

1.

$$\bar{y} = \frac{68}{5} = 13.6$$

$$\bar{x} = \frac{26}{5} = 5.2$$

$$b_1 = \frac{156.4}{64.8} = 2.41358$$

$$b_0 = 13.6 - 2.41358(5.2) = 1.0494$$

$$y = 1.049 + 2.414x$$

The answer is A.

2.

$$F = \frac{0.9}{0.1} * \frac{200 - 1 - 1}{1} = 1782$$

The answer is D

3.

$$y = 0.5 + 0.5x$$

$$0.5 + 0.5(10) = 5.5$$

$$2(0.5 + 0.5(5)) = 6$$

He would save 0.5 (USD)

The answer is B

4.

$$X'Y = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 2 & 0 & 3 \\ 1 & 1 & 2 & 0 & 0 \end{bmatrix} * \begin{bmatrix} 2 \\ 3 \\ 4 \\ 6 \\ 10 \end{bmatrix} = \begin{bmatrix} 25 \\ 43 \\ 13 \end{bmatrix}$$

$$(X'X)^{-1} * (X'Y) = \begin{bmatrix} 0.75 & -0.25 & -0.25 \\ -0.25 & 0.1944 & -0.0278 \\ -0.25 & -0.0278 & 0.3611 \end{bmatrix} * \begin{bmatrix} 25 \\ 43 \\ 13 \end{bmatrix} = \begin{bmatrix} 4.76 \\ 1.75 \\ -2.75 \end{bmatrix}$$

$$b_1 = 1.75$$

The answer is D

5.

$$F = \frac{0.8}{0.2} * \frac{200 - 4 - 1}{4} = 195$$

The answer is D.

6.

$$F = \frac{(R_f^2 - R_r^2)/(p_f - p_r)}{(1 - R_f^2)/(n - p_f - 1)}$$

$$10 = \frac{\frac{0.9 - x}{2}}{\frac{1 - 0.9}{100 - 4 - 1}}$$

$$x = 0.87894$$

Inputting $x = 0.85$ ends with an F statistic of 23.75.

Thus, the answer is E, as 0.8789 is not an answer

7.

$$110 + 15 = 125 = TSS$$

$$125 - 78 = 47 = RSS$$

The answer is C

8.

$$20 * \frac{0.2}{0.8} = \frac{n - 5 - 1}{5}$$

$$25 = n - 5 - 1$$

$$31 = n$$

The answer is B

9.

$$\pi = \frac{1}{1 + e^{-(1.53+0.735-0.031)}} = 0.903$$

The answer is D

10.

$$y = 200000 * e^{-15-1.2+0.15(25)+0.004(25^2)+0.012(25)} = 12.885$$

The answer is E

11.

$$\sqrt{y} = 0.6102 - 0.092 + 0.0015(150) = 0.7432$$

$$y = 0.7432^2 = 0.5523$$

The answer is A

12.

$$\bar{w} = 3$$

$$\hat{y}_{10+9} = 30 + (9 * 3) = 57$$

13.

$$y_{T+1} = 0.5(7) + 1 = 4.5$$

$$y_{T+2} = 0.5(4.5) + 1 = 3.25$$

$$y_{T+3} = 0.5(3.25) + 1 = 2.625$$

14.

$$\hat{s}_6 = 0.9(y_6 + 0.1y_5 + \dots + 0.1^5y_1) = 19.06$$

15.

$$\text{Entropy (1)} = \frac{20}{100} \left[-\frac{8}{20} \ln \left(\frac{8}{20} \right) - \frac{12}{20} \ln \left(\frac{12}{20} \right) \right] + \frac{80}{100} \left[-\frac{18}{80} \ln \left(\frac{18}{80} \right) - \frac{62}{80} \ln \left(\frac{62}{80} \right) \right] = 0.5611$$

$$\text{Entropy (2)} = \frac{10}{100} \left[-\frac{2}{10} \ln \left(\frac{2}{10} \right) - \frac{8}{10} \ln \left(\frac{8}{10} \right) \right] + \frac{90}{100} \left[-\frac{22}{90} \ln \left(\frac{22}{90} \right) - \frac{68}{90} \ln \left(\frac{68}{90} \right) \right] = 0.5506$$

Split 2 is preferred