1. $$\sum_{i=1}^{n} \frac{x_i y_i - n\bar{x}\bar{y}}{x_i^2 - n\bar{x}^2} = \hat{\beta}_1$$

$n = 6$

$\bar{x} = \frac{21}{6} = 3.5$

$\bar{y} = \frac{58}{6} = 9.\bar{6}$

$$\frac{259 - 6(3.5)(9.\bar{6})}{91 - 6(3.5^2)} = \frac{56}{17.5}$$

$3.2 = \boxed{B}$

2. $$\frac{2253 - 10(7.5)(21.1)}{759 - 10(7.5)^2} = \frac{670.5}{196.5}$$

$\hat{\beta}_1 = 3.4122$

$\hat{\beta}_0 = 21.1 - 3.4122(7.5)$

$\hat{\beta}_0 = -4.4915$

$y_{11} = -4.4915 + 3.4122(20) = 63.7525$

I am guessing w/rounding variations the answer is $\boxed{A}$

3. $$\hat{\beta}_1 = \frac{\sum_{i=1}^{n} (x-\bar{x})(y_i-\bar{y})}{\sum_{i=1}^{n} (x-\bar{x})^2} = \frac{192}{102} = 1.8824$$

$$\hat{\beta}_0 = \bar{y} - b_1\bar{x} = 13.75 - 1.8824(6) = 2.4559$$

$\boxed{A}$

4. $$R^2 = 1 - \frac{RSS}{TSS}$$

$$0.8 = 1 - \frac{300}{TSS} = \quad .2 = \frac{300}{TSS}$$

$$.2TSS = 300 \qquad TSS = 1500$$ $\boxed{C}$

5. $$0.7 = 1 - \frac{RSS}{1000} = \quad .3 = \frac{RSS}{1000}$$

$$300 = RSS$$ $\boxed{A}$

6.

#	y_i	$\hat{f}(x_i)$	$(y_i - f(x_i))^2$
1	1	4	9
2	2	3	1
3	6	7	1
4	8	9	1
5	4	6	4

RSS = 16 $\boxed{D}$

7. $F = \dfrac{\text{Regu } SS/1}{TSS/(n-2)}$?

(RSS?)

$$\frac{100,000}{120,000/(100-2)}$$

Found another version of formula online.

$$\frac{\overset{(RegS)}{SSR}/p}{\underset{(RSS)}{SSE}\,(n-p-1)}$$

SRR = Reg SS = $[RSS_1 - RSS_2]$

same as TSS

$$\frac{[RSS_1 - RSS_2]/1}{RSS_2/(100-2)}$$

$$\frac{120,000 - 100,000}{100,000/98} = \frac{20,000}{1020.4082} = 19.6 \quad \boxed{C}$$

8. $\text{Reg SS} = [R_2^2 - R_1^2] \quad RSS_2 = [1 - R_2^2]$

$$\frac{(.7-0)/1}{(1-.7)(100-2)} = \frac{.7}{.3/98} = 228.\overline{6}$$

$\boxed{E}$

9. Because p-value of the model is $0.00209 < .05$ the model is a better predictor reject H_0 for H_α

$.2 > .00209$

$.1 > .00209$

$.05 > .00209$

$.01 > .00209$

$\boxed{E}$

10.

$\bar{X} = 16$
$\bar{Y} = 1.2$

X	Y	$(X-\bar{X})$	$(Y-\bar{Y})$	$(X-\bar{X})^2$
12	1	-4	$-.2$	16
16	1.2	0	0	0
20	1.4	4	.2	16

$(-4 \times .2) + 0 + (4 \times .2)$ $\frac{1.6}{32}$ $\beta_1 = .05$

$\beta_0 = 1.2 - .05(16) = .4$

$y = .4 + .05x$

$y = .4 + .05(24) = \$1.60$ 24oz

$y = .4 + .05(48) = \$2.80$ 48oz

$2(1.60) = \$3.20 - \$2.80 = \$0.40$

$\boxed{C}$