



percentage of days with a high temperature below 30 degrees if the average high is 45 and the standard deviation is 10.” There are multiple correct answers to each part. For example, these could be blooms on a rose bush. You will probably want to look at the equations on the top of the first page.

A) COMBIN(18, 3)

B) 1-BINOM.DIST(5, 11, .25, TRUE)

5) (12 points) Answer EITHER Part A OR Part B.

A) If you typed in NORM.DIST(59, 80, 10, TRUE), then you would get .135. What does that tell you? Make sure you mention an example of what question you are asking like in Question #4.

B) Use the table of descriptive statistics called “Grade” to the right to answer TWO of the following questions.

B1) What does the fact that the mean is less than the median tell you? Briefly explain your logic.

B2) What does the negative Kurtosis tell you? Briefly explain your logic.

B3) Given the count, why did I choose 3 for smallest? Briefly explain your logic.

6) (12 points) For EITHER what is typed in Part A OR what is

typed in Part B, tell me what is being calculated and how you reached that conclusion. Use the table below to answer this question.

Your answer should be either “The Laspeyres Price Index for \_\_\_ using \_\_\_ as the base year” or “The Paasche Price Index for \_\_\_ using \_\_\_ as the base year.” Then explain your logic.

A) =SUMPRODUCT(D2:D6,K2:K6)/SUMPRODUCT(J2:J6,K2:K6)\*100

B) =SUMPRODUCT(D2:D6,E2:E6)/SUMPRODUCT(J2:J6,E2:E6)\*100

<i>Grade</i>	
Mean	77.21
Standard Error	1.804
Median	78
Mode	78
Standard Deviation	10.36
Sample Variance	107.4
Kurtosis	-0.543
Skewness	-0.513
Range	39
Minimum	53
Maximum	92
Sum	2548
Count	33
Largest(3)	91
Smallest(3)	60
Confidence Level(95.0%)	3.67

tion. Your answer should be either “The Laspeyres Price Index for \_\_\_ using \_\_\_ as the base year” or “The Paasche Price Index for \_\_\_ using \_\_\_ as the base year.” Then explain your logic.

A) =SUMPRODUCT(D2:D6,K2:K6)/SUMPRODUCT(J2:J6,K2:K6)\*100

B) =SUMPRODUCT(D2:D6,E2:E6)/SUMPRODUCT(J2:J6,E2:E6)\*100

	A	B	C	D	E	F	G	H	I	J	K
1	Good	Price '08	Q '08	Price '09	Q '09	Price '10	Q '10	Price '11	Q '11	Price '12	Q '12
2	Figs	\$1,008.38	279	\$1,018.75	9	\$1,023.10	114	\$1,005.48	45	\$1,024.30	290
3	Gas	\$43.05	206	\$84.55	6	\$61.92	304	\$71.50	1345	\$45.78	36
4	Ham	\$1.13	1290	\$1.87	147	\$1.07	949	\$1.26	183	\$0.94	112
5	Irises	\$106.05	973	\$69.68	342	\$87.82	169	\$75.47	126	\$90.60	335
6	Jam	\$0.72	333	\$1.41	1460	\$0.59	468	\$0.88	1290	\$0.69	194

7) (14 points) Answer EITHER Part A OR Part B.

A) The first stage of research is to start with a management question, and then refine it to a research question, then an investigative question, and eventually the measurement question. What is meant by the management question? Give an example and state why it needs to be refined.

B) Explain the difference between the explanatory and predictive types of research.

8) (14 points) Answer EITHER Part A OR Part B.

A) What is meant by post-coding? What type of survey questions would you do that? Explain your logic.

B) Why might a quantitative research question give you more information than a qualitative research question. Briefly state what each is and explain your logic.

9) (14 points) Answer EITHER Part A OR Part B.

A) When would you use the equation  $n = \pi(1-\pi)*(Z/E)^2$ ? What are  $\pi$ ,  $Z$ , and  $E$  and the values typically used for them?

B) What does “t-Test: Paired Two-Samples for Means” mean? What do the “Pearson Correlation,” “t,” and the two “t Critical” in the table to the right tell us? Explain your logic.

Question 9B: t-Test: Paired Two-Sample for Means		
	Exam 1	Exam 2
Mean	177.33235	147.70588
Variance	485.29654	2007.9706
Observations	17	17
Pearson Correlation	0.8195809	
Pooled Variance	1246.6336	
Hypothesized Mean Difference	0	
df	16	
t	4.1291218	
P(T<=t) one-tail	0.0004	
t Critical one-tail	1.7458837	
P(T<=t) two-tail	0.0008	
t Critical two-tail	2.1199053	

10) (16 points) Answer EITHER Part A OR Part B.

A) I discussed in the lab the problem with getting a good operational definition of the number of students at Bethany College. If you were to define the number of students in an attempt to figure out how many classes need to be offered, how would you define a student? (Remember, there are both full-time students and part-time students.)

B) Explain the *Mills Method of Difference* method for determining what variable caused the event.

11) (16 points) Answer EITHER Part A OR Part B.

A) One type of non-probability sampling is “snowball sampling.” What is that and when would that be a good method of sampling? Give an example and explain why you would sample that way.

B) Why is confidentiality important for surveys?

12) (16 points) Answer EITHER Part A OR Part B.

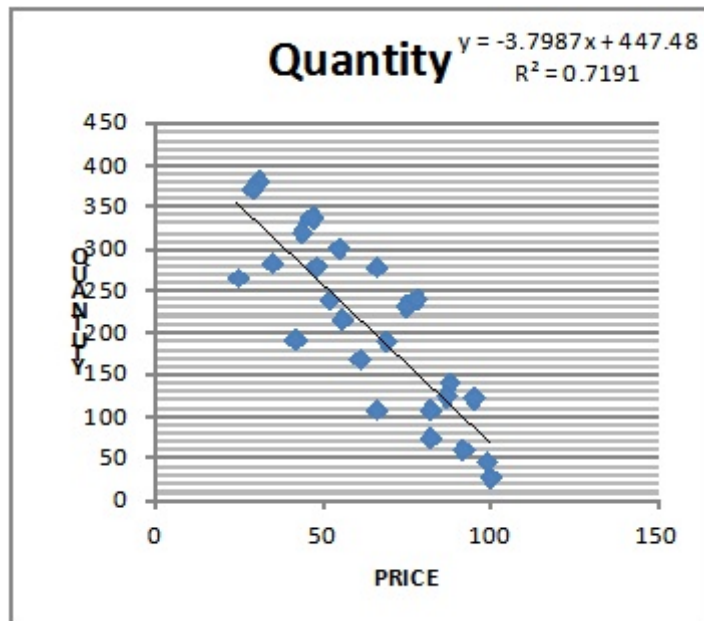
A) Explain the difference in audience and writing format between a technical report and a managerial report. Why is the writing different? Explain your logic.

B) Explain the difference in audience and writing format between a technical report and a managerial report. Which would you use if you were writing a press release? Explain your logic.

13) (20 points) Answer EITHER Part A OR Part B.

A) For the scatter diagram to the right, are we using quantity to predict price or vice versa? (The vertical axis says “Quantity.”) Explain your logic. Would you say these results are good? Explain your logic. What would you estimate Pearson’s Coefficient of Correlation ( $r$  or  $\rho$ ) to be? Explain your logic.

B) The table to the on the next page is showing how much the sales of ice cream at different times and flavors. What does “Anova: Two Factors” mean. What is the null hypothesis? Do we reject it? Explain your logic.



14) (20 points) Answer EITHER Part A OR Part B.

A) Course evaluations at Bethany College used to be in class, but are now online. What is the big **advantage** of that change? Explain your logic. What is the big **disadvantage** of that change? Explain your logic. Do you think the change to an online survey was a good one? Explain your logic.

B) For Bethany College's course evaluations, there are several things they do which are good for self-administered surveys online. What are TWO things they do well and why is that desirable.

15) (26 points) Answer EITHER Part A OR Part B.

A) Suppose you theorized that smarter athletes play better than dumb athletes. You have data on the average GPA for 120 college basketball teams and the winning percentages of those teams. What would your null hypothesis and alternative hypothesis be? Explain why you chose those. What would your Type I error be and what would your Type II error be? Explain your logic.

B) Suppose you theorized smaller colleges teach topics better than big universities. You have GRE (test to get into graduate school) statistics and school size for 50 small colleges and 20 big universities which have similar average SAT scores for their entering classes. What would your null hypothesis and alternative hypothesis be? Explain why you chose those. What would your Type I error be and what would your Type II error be? Explain your logic.

Question 13B: Anova: Two-Factor Without Replication						
<b>SUMMARY</b>						
	Count	Sum	Average	Variance		
Jan	3	18	6	3		
Feb	3	10	3.333333	0.333333		
Mar	3	17	5.666667	2.333333		
Apr	3	18	6	7		
May	3	28	9.333333	2.333333		
Jun	3	47	15.66667	12.33333		
Jul	3	47	15.66667	9.333333		
Aug	3	47	15.66667	0.333333		
Sep	3	46	15.33333	2.333333		
Oct	3	15	5	9		
Nov	3	9	3	1		
Dec	3	9	3	7		
Chocolate	12	102	8.5	24.27273		
Vanilla	12	102	8.5	40.45455		
Rocky road	12	107	8.916667	32.99242		
<b>ANOVA</b>						
Source of Variation	SS	df	MS	F	P-value	F crit
Rows	963.6389	11	87.60354	17.31952	2.32e-08	2.258518
Columns	1.388889	2	0.694444	0.137294	0.872455	3.443357
Error	111.2778	22	5.058081			
Total	1076.306	35				

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.917219
R Square	0.841291
Adjusted R Square	0.83439
Standard Error	32.18081
Observations	49

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	252519.9	126259.9	121.9191	4.11E-19
Residual	46	47637.81	1035.605		
Total	48	300157.7			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-25.641	19.07887	-1.34395	0.185558	-64.0447	12.76282	-64.0447	12.76282
Price balls	0.015821	0.001014	15.59829	5.45E-20	0.013779	0.017863	0.013779	0.017863
Price bats	3.572111	4.168041	0.857024	0.395875	-4.81772	11.96194	-4.81772	11.96194