These problems all draw on data that come from the text (or a previous edition). If you are ready for the test you should recognize what to do. The advantage of this format is that you cannot see what to do by looking at previous pages of the text. See if you are ready. But if you are not, find the data in the text and study the material again. Hints are given in the yellow notes.

1) The data below are stress scores for random samples of people who work in three occupations. Use the data to test for a difference in the mean stress level among the occupations. α = .05.

Real Estate Agent Architect Stockbroker

Real Estate Agent	Architect	Stockbroker
81	43	65
48	63	48
68	60	57
69	52	91
54	54	70
62	77	67
76	68	83
56	57	75
61	61	53
65	80	71
64	50	54
69	37	72
83	73	65
85	84	58
75	58	58

2) The data below give P/E ratios for random samples of corporations in three industries. Use the data to test for a difference in the mean ratios. α = .05.

Company	Industry	P/E
Citicorp	1	15
NationsBank	1	14
Wells Fargo	1	25
First Union	1	13
KeyCorp	1	14
Chase Manhattan	1	12
Fifth Third Bancorp	1	23
Bank of New York	1	17
First Chicago	1	3
Mellon Bank	1	16

Fleet Financial Group	1	15
First Bank System	1	16
American Express	2	19
Travelers	2	15
Merrill Lynch	2	12
MBNA	2	24
Cincinnati Financial	2	19
Franklin Resources	2	22
Fannie Mae	2	17
American International Group	3	21
Allstate	3	14
Marsh & McLennan	3	20
American General	3	16
Cigna	3	12
Lincoln National	3	13
AFLAC	3	21
Equitable	3	11
Chubb	3	20
General Re	3	15

2b) Construct all pairwise differences in the industry means at the 95 % level of confidence, using the simple LSD method.

2c) Construct all pairwise differences in the industry means at the 94 % level of confidence, using the Bonferroni method.

3) Five automobiles were used to compare gasoline mileage for three gas types. Miles per gallon for the three gasoline types are given for each of the five automobiles. Test the hypothesis appropriate to the data. $\alpha = .01$.

		Gasoline		
		I	II	III
	Art's car	18	21	20
	Bob's car	24	26	27
autos	Carl's car	30	29	34
	Dave's car	22	25	24
	Ed's car	20	23	24

4) Use the data below to conduct a two factor AOV for the effect of position and experience on salary. Allow for interaction, α = .05.

Observation Salary ($) Position Experience

Observation	Salary ($)	Position	Experience
1	28,938	Inside	Medium
2	27,694	Inside	Medium
3	45,515	Outside	Low
4	27,031	Inside	Medium
5	37,283	Outside	Low
6	32,718	Inside	Low
7	54,081	Outside	High
8	23,621	Inside	Low
9	47,835	Outside	High
10	29,768	Inside	Medium
11	27,282	Inside	Medium
12	30,632	Inside	Low
13	38,856	Outside	Low
14	26,827	Inside	Medium
15	26,948	Inside	Low
16	31,588	Inside	Medium
17	43,858	Outside	Low
18	38,478	Outside	Low
19	58,846	Outside	Medium
20	34,253	Inside	High
21	28,464	Inside	Low
22	58,176	Outside	Medium
23	35,949	Inside	High
24	27,833	Inside	Low
25	47,914	Outside	High
26	58,040	Outside	Medium

5) a) Use the table below to test all possible hypotheses.
b) How does your answer change if the rows identify blocks?

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Rows	2795.6	9	310.6222222	1.05510266	0.42506065	2.25013252
Columns	19805.2	3	6601.733333	22.4243659	1.7029E-07	2.96034841
Error	7948.8	27	294.4			
Total	30549.6	39				

6) a) Use the data below to test the hypothesis that no load mutual funds have the same return that load funds do.
b) Construct a confidence interval for the difference in the mean returns.

Mutual Funds - Load	Return	Mutual Funds - No Load	Return
American National Growth	15.51	Amana Income Fund	13.24
Arch Small Cap Equity	14.57	Berger One Hundred	12.13
Bartlett Cap Basic	17.73	Columbia International Stock	12.17
Calvert World International	10.31	Dodge & Cox Balanced	16.06
Colonial Fund A	16.23	Evergreen Fund	17.61
Common Sense Growth	16.04	Fidelity Fund	20.61
Corefund Core Equity	18.77	Forthis Advtg Cap App	13.38
Davis Convert Seurities	18.21	Founders Blue Chip Fund	17.15
Deleware Small Cap	17.27	Goldman Core Fixed Income	10.38
Dreyfus Premium Value	11.95	Heartland Value	18.15
Federated Stocks & Bonds	13.81	Janus Fund	15.82
First Invest FD for Income	12.44	Manstay Cap Appriciation	17.29

7) The data below give earnings in 97 matched to those in 96 for the firms listed. Use the data to test the hypothesis that mean earnings in 96 and 97 were the same.
b) Construct a confidence interval for the difference in the mean earnings.

Company	Earnings 96	Earnings 97
Atlantic Richfield	1.16	1.17
Balchem Corp	0.16	0.13
Black & Decker Corp	0.97	1.02
Dial Corp	0.18	0.23
DSC Communications	0.15	-0.32
Eastman Chemical	0.77	0.36
Excel Communications	0.28	-0.14
Federal Signal	0.40	0.29
Ford Motor Company	0.97	1.45
GTE Corp	0.81	0.73
ITT Industries	0.59	0.6
Kimberly-Clark	0.61	-0.27
Minnesota Mining & Mfr.	0.91	0.89
Procter & Gamble	0.63	0.71

8) a) These are random samples of values of the DJIA in November and December. Test the hypothesis that this value is equally variable in the two time periods.
b) Test the hypothesis that the population mean of this value is equal in the two time periods.

November	December
7493	8066
7525	8209
7760	7842
7499	7943
7555	7846
7690	8071
7668	8055
7600	8159
7516	7828
7711	8109

9) You should be able to interpret all of this printout.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.735101
R Square	0.540374
Adjusted R Square	0.425467
Standard Error	14.16456
Observations	16

ANOVA

	df	SS	MS	F
Regression	3	2830.58625	943.52875	4.70271908
Residual	12	2407.6167	200.634725	
Total	15	5238.20295		

	Coefficients	Standard Error	t Stat	P-value
Intercept	-179.973	112.858543	-1.5946793	0.13676805
Curb Weight (lb.)	-0.01431	0.0167821	-0.8524396	0.41066111
Horsepower	-0.15314	0.14947024	-1.0245438	0.32578912
Speed at 1/4 mile (mph)	3.141385	1.29764869	2.42082886	0.03226857