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BROCK UNIVERSITY

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Name_____

Student Number_____

VERSION B

Write your name on the scantron sheet and shade in the boxes for your student number.
Write "Version B" in the top corner of the scantron.

One piece of paper, containing hand writing and nothing glued, attached, printed or photocopied on this paper, and a Sharp EL510R calculator are the only aids permitted.

Use or possession of unauthorized materials will result in a grade of zero for this examination.

Also note that in order to pass this course you must obtain at least 30% on this examination.

All answers are correct to 3 significant digits unless otherwise specified.
"None of the above" correct answers are different than any of the choices by at least 2 in the third significant digit.

All questions are 1 mark.

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Consider the following volumes of a medium coffee in a sample of several coffee shops 380 mL, 420 mL, 500 mL, 410 mL, 490 mL. Use this information for the next 3 questions.

1. The difference between the median and mean volume is
a. 10 mL
b. 20 mL
c. 30 mL
d. 40 mL
e. 50 mL

2. The standard deviation of the volumes is
a. 52.4 mL
b. 46.9 mL
c. 53.7 mL
d. 41.5 mL
e. 71.6 mL

3. A random medium coffee was chosen, what is the probability the cup contained more than 400 mL of coffee?
a. 0.2
b. 0.8
c. 1.2
d. 0.5
e. none of the above

……

4. A regression analysis was done to investigate a linear relationship between price and size of coffee using a 5% significance level for the slope.

Regression Analysis: price $ versus size mL

```
The regression equation is
price $ = 1.29 + 0.00120 size mL

Predictor       Coef    SE Coef     T      P
Constant      1.2945     0.4544  2.85  0.065
size mL    0.0012024  0.0005941  2.02  0.136

S = 0.594955   R-Sq = 57.7%   R-Sq(adj) = 43.6%
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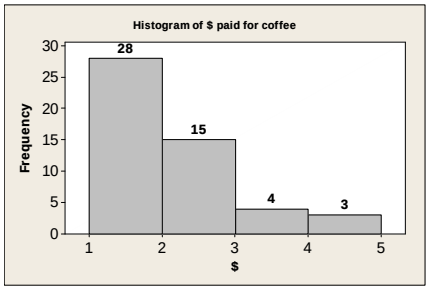
Use this Minitab output, to find the predicted price of a 500 mL cup.
a. $1.89
b. $1.29
c. $1.50
d. $1.37
e. cannot be determined because the slope of the regression line is not significant.

5. Consider the following histogram of amount paid for coffee in the morning.
The mean amount paid was :



a. $1.07
b. $2.14
c. $3.65
d. $1.56
e. none of the above

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Consider a taste test done with coffee from McDonalds, Tim Hortons, Starbucks and Bridgehead.
The sample showed that 18 preferred McDonalds, 24 Tim Hortons, 20 Starbucks and 26 Bridgehead. At the 5% significance level does this data show the preference choices are all equally likely to occur ? Use this information or the next 3 questions

6. The test statistic is :
a. 0.2045
b. 0.2727
c. 1.818
d. 29.54
e. 6.321

7. The diagram or this hypothesis test is:
a. symmetrical 2 tail
b. right skewed right tail
c. symmetrical left tailed
d. right skewed left tail
e. symmetrical right tail

8. It can be concluded at the 5% significance level,
a. the proportion preferring Bridghead is greater
b. all coffees are equally likely to be preferred
c. there is a difference in proportions.
d. at least two coffee preferences are different
e. the data does not fit the distribution of equal preferences

……

A scout troop has 5 girls, 8 boys , 2 female leaders and 1 male leader. Use this information for the next two questions.

9. Two people are picked at random , one to referee a game and one to score the game. The probability that both are male is:
a. 0.281
b. 0.316
c. 0.563
d. 0.3
e. 0.125

10. Four people are picked at random to plan a menu for an upcoming camp.
The probability that 3 are female scouts and 1 is a female leader, is:
a. 0.01099
b. 0.3
c. 0.8
d. 0.01921
e. none of the above

11. The probability a scout in a troop will decide to **not** attend a winter camp in the snow is 0.1. The probability a scout at the winter camp will bring the right clothing 0.85. Given that the scout has the right clothing packed, the probability they will keep dry and warm is 0.95.
Find the probability that a person will attend the winter camp, will bring the right equipment , but does not stay dry and warm.
a. 0.727
b. 0.0619
c. 0.0383
d. 0.00425
e. 0.00382

……
For a weekend getaway, a last minute travel company does a study to investigate age and choice of short vacation. A random person is chosen for a detailed survey. Use this information for the next 3 questions.

	North American City	Beach resort, Caribbean	European City	totals
Under 30	33	51	25	109
30-45	27	31	28	86
Over 45	15	18	45	78
totals	75	100	98	273

12. Given that the person chose a European city, what is the probability they are under 30?
a. 0.2551
b. 0.368
c. 0.229
d. 0.0916
e. none of the above

13. Find the probability that the person is either over 45 or going to a beach resort in the Caribbean.
a. 0.210
b. 0.463
c. 0.586
d. 0.652
e. 0.339

14. Find the probability the person is under 30 and going to a North American city.

a. 0.121
b. 0.44
c. 0.303
d. 0.133
e. 0.315

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A newspaper is available as an online subscription and as a paper version. The probability that the newspaper reader uses the online version is 0.4.
A telephone survey takes place with a random sample of 10 subscribers.
Use this information for the next three questions.

15. When finding the probability that exactly 8 of the 10 people in the sample read the newspaper online, the probability distribution used is the :
a. normal distribution
b. chi square distribution
c. t distribution
d. Poisson distribution
e. none of the above

16. The probability that exactly 8 people in the sample read the newspaper online is :
a. 0.2973
b. 0.0106
c. 0.4
d. 0.8
e. 0.0222

17. The standard deviation of the distribution is:
a. 1.89
b. 2.75
c. 1.55
d. 4
e. none of the above

……

Online news articles often have more typos than when written on paper. On average there are 2 typos in 317 words. This can be approximated by a Poisson distribution.
Use this information for the next 3 questions.

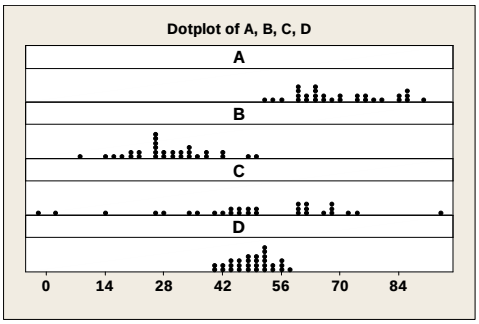
18. Find the probability that exactly 5 typos are made in 317 words.
a. 0.0468
b. 0.0842
c. 0.0282
d. 0.0462
e. 0.0361

19. An article has 634 words. In order to find the probability that there is at least 1 typo, the value of lambda is:
a. 1
b. 4
c. 5
d. 6
e. 2.5

20. Find the probability that there is at least 1 typo in 634 words.
a. 0.982
b. 0.0183
c. 0.0733
d. 0.861
e. 0.0225

……

21. Which of the following is true
a. A has largest standard deviation and largest mean
b. B has the smallest mean
c. C has the largest standard deviation and smallest mean
d. D has the largest mean
e. none of the above



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You pay $1 for a ticket for a draw. There are 250 tickets sold. The first prize is a gift certificate for $50, there are 5 second prizes of $10 gift certificates and 20 prizes of a $1 coupon. Consider the following probability distribution for the net winnings. Use this information for the next two questions

Net winnings x	0	$9	$49	-$1
P(x)	A	0.02	0.004	

22. What is probability 'A'?
a. 0.08
b. 0.896
c. 0.02
d. 0.2
e. 0.00833

23. What are the expected winnings?
a. -$0.46
b. $0.18
c. -$0.52
d. -$0.27
e. none of the above

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Use the following information for the next 4 questions The time that a skier takes on a downhill course has a normal distribution with a mean, μ, of 12.3 minutes and standard deviation, σ, of 0.4 minutes.

24. When finding the probability that on a random run the skier takes between 12.1 and 12.3 minutes, the calculated z-score for the time of 12.1 minutes is:
a) 0.5
b) 0
c) -0.5
d) 0.3085
e) 0.8085

25. The probability that a skier takes between 12.1 and 12.3 minutes on a random run is
a) 0.8085
b) 0.3085
c) 0.1915
d) 0.6915
e) None of the above

26. Consider the group consisting of the 20% of skiers with the shortest times. The z-value corresponding to this percentage is
a) 0.84
b) -2.05
c) -0.84
d) 2.05
e) None of the above

27. The maximum time that a skier in this group would take is
a) 12.636
b) 11.480
c) 11.964
d) 13.120
e) None of the above

……..
Use the following information for the next 2 questions. The heights of students at a university are normally distributed with a mean of 175 cm and a standard deviation of 6 cm. A group of 25 students is sampled.

28. When finding the probability that the mean of the sample of the 25 students is greater than 177 cm, the calculated z-value is
a) 0.4
b) -1.67
c) 0.333
d) -0.333
e) 1.67

29. The probability that the mean of the sample of the 25 students is greater than 177 cm is
a) 0.4525
b) 0.9525
c) 0.0475
d) 0
e) None of the above
.....

Use the Minitab output to answer the next 2 questions. The population of interest is the weight (in grams) of a variety of plum.

Cumulative Distribution Function
Normal with mean = *** and standard deviation = 6

x	P(X <= x)
163	0.022750
175	0.500000
177	0.630559

30. Which of the following statements is true?
a) Sample mean =175, sample standard deviation =6
b) Sample mean is unknown, sample standard deviation =6
c) Population mean =175, population standard deviation =6
d) Population mean is unknown, population standard deviation =6
e) None of the above is correct.

31. From the Minitab printout,
a) $P(163 < x \leq 177) = 0.607809$
b) $P(163 \leq x \leq 177) = 0.607809$
c) $P(x > 177) = 0.369441$
d) $P(x \geq 163) = 0.977250$
e) More than one of these choices is correct.

.....

32. A researcher uses an ANOVA to test for mean differences among three age groups using a sample of n =10 participants in each age group. The F-ratio from this analysis would have
a) df numerator = 2, df denominator =29
b) df numerator = 2, df denominator = 27
c) df numerator = 3, df denominator =27
d) df numerator = 27,df denominator =2
e) df numerator = 29, df denominator =2

33. In reading a scientific article you encounter the following table:

Analysis of Variance

Source	SS	df	MS	F
Factor	722.7	4	180.68	.....
Error	473.3	40		

Further reading indicates that all sample sizes are equal. Then you know that the experimenter used

a) 4 samples of size 10
b) 5 samples of size 10
c) 4 samples of size 9
d) 5 samples of size 9
e) None of these

34. The value of the test statistic is:
a. 12.6
b. 15.3
c. 12.9
d. 180.68
e. 473.3

.....

Use this information for the next 5 questions.
Mr. Allen can drive to work along four different routes, and the number of minutes taken on five different occasions for each route is

	Route 1	Route 2	Route 3	Route 4
	22	25	26	26
	26	27	29	28
	25	28	33	27
	25	26	30	30
	31	29	33	30
Total	129	135	151	141

The Minitab analysis follows:

One-way ANOVA: Route 1, Route 2, Route 3, Route 4

```
Source  DF      SS     MS     F      P
Factor   3   52.80  17.60  2.80   *****
Error   16    ****   ****
Total   19    ****

S = 2.505   R-Sq = 34.46%   R-Sq(adj) = 22.18%


                         Individual 90% CIs For Mean Based on
                         Pooled StDev
Level  N    Mean  StDev  -----+---------+---------+---------+----
C1     5  25.800  3.271  (-------*-------)
C2     5  27.000  1.581       (-------*-------)
C3     5  30.200  2.950                 (-------*-------)
C4     5  28.200  1.789            (-------*-------)
                         -----+---------+---------+---------+----
                           25.0      27.5      30.0      32.5
Pooled StDev = 2.505
```

35. The alternate hypothesis for the ANOVA is
a) The mean times are all different.
b) At least 2 of the mean times are different from each other.
c) The mean times are all equal.
d) The mean time for Route 1 is the shortest.
e) None of the above.

36. The sum of squares within is
a) 52.80
b) 100.4
c) 153.2
d) 17.6
e) 6.28

37. Which is a true statement about the P-value?
a) 0.1> P-value > 0.05
b) 0.05 > P-value > 0.025
c) 0.025 > P-value > 0.01
d) 0.01 > P-value
e) P-value cannot be determined from the information given.

38. At $\alpha = 0.1$, the conclusion of the test is
a) At least 2 of means are different from each other.
b) All means are the same.
c) The mean of the third population is larger than the other 3 population means.
d) The mean of the third population is significantly different than the mean of the other populations.
e) None of the above.

39. Using the Minitab confidence intervals and the answer to the previous question, it is implied that :

a. All the routes have the same population mean.

b. Route 1 has a lower population mean time than Route 3.

c. Route 1 and 2 have different population means than Route 3 and 4.

d. All the routes have different population means.

e. none of the above

……..

At a fitness club, an analysis is done of the time (hours/week) a member spends on fitness classes compared to the time the member spends on equipment. A sample of 7 members was used and the resulting Minitab shown below. Assume both x and y form normal distributions. Use this information for the next 13 questions.

Regression Analysis: equip(y) versus class(x)

```
The regression equation is
equip(y) = 3.78 - 0.797 class(x)


Predictor     Coef  SE Coef      T      P
Constant    3.7774   0.5879   6.43  0.001
class(x)   -0.7968   0.1944    **** ****

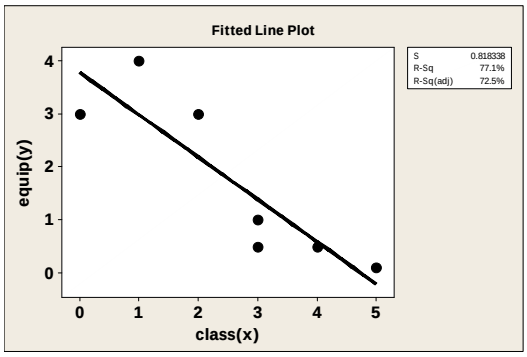
S = 0.818338   R-Sq = 77.1%   R-Sq(adj) = 72.5%

Analysis of Variance
Source          DF      SS      MS      F      P
Regression       1  11.246  11.246  16.79  0.009
Residual Error   5   3.348   0.670
Total            6  14.594

Predicted Values for New Observations
New Obs    Fit  SE Fit      90% CI          90% PI
      1  1.785   0.310  (1.162, 2.409)  (0.022, 3.549)

Values of Predictors for New Observations
New Obs  class(x)
      1      2.50

class(x)     equipment(y)
3            1.0
4            0.5
5            0.1
1            4.0
2            3.0
0            3.0
3            0.5
```



40. The slope of the regression line is
a. -0.797
b. 3.78
c. 0.1944
d.1.785
e. -0.771

41. The correlation coefficient is
a. 0.878
b. 0.771
c. 0.851
d. 0.725
e. none of the above

42. The percent of the variation that is predicted by the regression line is
a. 79.7%
b. 3.78%
c. 72.5%
d. 77.1%
e. none of the above

43. Calculate $\sum x^2 - \frac{1}{n}\left(\sum x\right)^2$
a. -567
b. 17.7
c. 14.3
d. 281.4
e. none of the above

A hypothesis test is done to determine whether the slope is significant, that is different from zero. Answer the following 5 questions about this hypothesis test.

44. The alternate hypothesis is:
a. $H_1 : \mu = 0$
b. $H_1 : \rho \neq 0$
c. $H_1 : \beta = 0$
d. $H_1 : \rho = 0$
e. $H_1 : \beta \neq 0$

45. The distribution used for this hypothesis test is
a. normal
b. t
c. F
d. chi square
e. geometric

46. The test statistic is
a. -2.382
b. -1.856
c. -4.097
d. 6.431
e. none of the above

47. The degrees of freedom are:
a. 7
b. 6
c. 5
d. 4
e. 3

48. The P value is
a. $0.01 > P > 0.001$
b. $0.005 > P > 0.0005$
c. $P < 0.001$
d. $0.01 > P > 0.005$
e. $0.05 > P > 0.02$

49. At the 1% significance level it can be concluded
a. The slope is negative.
b. The slope is significant.
c. The slope is zero.
d. The slope is positive.
e. The slope is varying.

50. What is the 90% margin of error of the confidence interval for the slope?
a. 0.320
b. 1.786
c. 0.0221
d. 0.378
e. 0.392

51. Under 'Fit' the number 1.785 represents
a. the mean fitness level
b. the number of hours of class when there are 2.5 hours of equipment use
c. the standard error of fit of the regression line
d. the mean of y, that is $\bar{y}$
e. none of the above

52. If a vertical line was drawn on the plot to represent the 90% confidence interval for the prediction made by Minitab, how many hours would be represented by the length of this vertical line.
a. 1.785
b. 3.549
c. 2.409
d. 1.247
e. 3.527

……
Consider the following Minitab output of the mean hours of movies watched on a day flight and a night flight across the Atlantic. Use this information for the next 5 questions.

Two-Sample T-Test and CI: day flight, night flight

```
Two-sample T for day flight vs night flight

               N   Mean  StDev  SE Mean
day flight    16   2.81   1.47     0.37
night flight  13  2.255  0.440     0.12

Difference = mu (day flight) - mu (night flight)
Estimate for difference:  0.557
T-Test of difference = 0 (vs >): T-Value = 1.44  P-Value = ****
```

53. The formula used to calculate the test statistic is:

a. $z = \dfrac{\bar{x}_1 - \bar{x}_2}{\sqrt{\dfrac{\sigma_1^2}{n_1} + \dfrac{\sigma_2^2}{n_2}}}$

b. $E = \dfrac{t_c s_d}{\sqrt{n}}$

c. $E = t_c \sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}$

d. $t = \dfrac{\bar{x}_1 - \bar{x}_2}{\sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}}$

e. $E = z_c \sqrt{\dfrac{\hat{p}\hat{q}}{n}}$

54. The number of degrees of freedom is
a. 12
b. 13
c. 14
d. 15
e. 16

55. The P value is :
a. 0.0749
b. 0.20 >P > 0.15
c. 0.9251
d. 0.1 > P > 0.075
e. none of the above

56. It can be concluded at the 5% significance level :
a. there is a difference in hours of movies watched between day flight and a night flight
b. there are not more hours of movies watched during the night
c. there are not more hours of movies watched during the day
d. there is not a difference in hours of movies watched between a day and a night flight
e. none of the above

57. The margin of error of the 95% confidence interval is calculated to be 0.844 hours. What is the confidence interval for this difference in means.
a. (0.186, 1.874) hours
b. (0.596, 2.284) hours
c. (1.966, 3.654) hours
d. (1.411, 3.099) hours
e. (-0.287, 1.401) hours
……..

58. How many people need to be surveyed to be 90% sure of being within 2% of the population proportion who put their car in a garage overnight?
a. 1692
b. 609
c. 723
d. 1856
e. none of the above

59. A two tailed hypothesis test is done and the test statistic z found to be 1.32. The corresponding P value is:
a. 1.32
b. 0.0934
c. 0.132
d. 0.9066
e. none of the above

60. As the confidence level increases for a given set of data,
a. the length of the confidence interval decreases and the critical value decreases
b. the length of the confidence interval increases and the critical value increases
c. the length of the confidence interval increases and the critical value decreases
d. the length of the confidence interval decreases and the critical value increases
e. an increase of decrease would depend on the distribution used.

A sample of 70 people in a sushi restaurant showed that 25 did not choose the raw fish items on the menu, instead they ate the cooked items. Consider the calculation for the margin of error of the 95% confidence interval for the population proportion avoiding the raw fish items. Use this information for the next two questions

61. The critical value used in this calculation is
a. 2.060
b.2.326
c. 1.645
d. 0.3571
e. 1.96

62. The upper limit of the 95% confidence interval for the proportion is
a. 0.1122
b. 0.3472
c. 0.469
d. 0.713
e. 1.062

……
For a cleaning and check up at a dentist, the mean time spent with the actual dentist after the dental hygienist is finished is thought to be 2.5 minutes. The time forms an approximately normal distribution. A hypothesis test is done and the results shown below. Use this information for the next 4 questions .

One-Sample T

```
Test of mu = 2.5 vs not = 2.5

 N    Mean   StDev  SE Mean       95% CI           T      P
23  2.4200  0.1500   0.0313  (2.3551, 2.4849)  -2.56  0.018
```

63. The alternate hypothesis is :
a. the mean time is greater than 2.5 minutes
b. the mean time is not greater than 2.5 minutes
c. the mean time is less than 2 min
d. the mean time is not less than 2.5 min
e. none of the above

64. When drawing a critical value diagram at the 5% significance level , the critical value found in the tables is
a. 1.645
b. 1.717
c. 1.96
d. 2.074
e. 2.069

65 . (continuing from the previous question) On this critical value diagram ,
a. the test statistic is in the shaded rejection region
b. the test statistic is to the right of the critical value
c. the P-value area is shaded to represent the rejection region
d. the area to the left of the test statistic corresponds to alpha.
e. none of the above

66. The formula for the margin of error for the 95% confidence interval is :

a. $z = \dfrac{\overline{x}_1 - \overline{x}_2}{\sqrt{\dfrac{\sigma_1^2}{n_1} + \dfrac{\sigma_2^2}{n_2}}}$

b. $E = \dfrac{t_c s}{\sqrt{n}}$

c. $E = t_c \sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}$

d. $t = \dfrac{\overline{x}_1 - \overline{x}_2}{\sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}}$

e. $E = z_c \sqrt{\dfrac{\hat{p}\hat{q}}{n}}$

. . . . . .

The manager of a fleet of automobiles is testing two brands of radial tires. One tire of each brand is placed on the two rear wheels of eight cars. The cars are run until the tires wear out. The data are shown below (in thousands of kilometers). Use this information for the next 6 questions.

	Car 1	Car 2	Car 3	Car 4	Car 5	Car 6	Car 7	Car 8
Brand 1	36.9	45.3	36.2	32.1	37.2	48.4	38.2	33.5
Brand 2	34.1	42.3	35.5	32.0	38.0	47.8	37.8	33.2

Do a complete hypothesis test at 5% significance level to determine whether there is a difference between the mean life of Brand 1 and Brand 2. Use the order Brand 1-Brand 2.

67. The sample standard deviation of the differences is
a. 0.4684
b. 1.3250
c. 1.2394
d. 0.8875
e. 5.6040

68. The alternate hypothesis is:

a. $H_1 : \mu_1 \neq \mu_2$

b. $H_1 : \mu_1 > \mu_2$

c. $H_1 : \mu_d > 0$

d. $H_1 : \mu_d \neq 0$

e. none of the above

69. The test statistic is

a. 0.3266

b. 1.895

c. 1.542

d. 2.693

e. none of the above

70. The degrees of freedom are

a. 8

b. 9

c. 7

d. 14

e. 13

71. Given that the P value is between 0.1 and 0.15, we can conclude, at the 5% significance level that,

a. the mean life of Brand 1 is greater than Brand 2.

b. the mean life of Brand 2 is greater than Brand 2.

c. there is a difference between the mean life of Brand 1 and Brand 2.

d. there is no difference between the mean life of Brand 1 and Brand 2.

e. the mean life of Brand 1 is not greater than the mean life of Brand 2.

72. When calculating the margin of error for the 90% confidence interval for the mean of the differences, the formula and critical value are:

a. $z = \dfrac{\overline{x}_1 - \overline{x}_2}{\sqrt{\dfrac{\sigma_1^2}{n_1} + \dfrac{\sigma_2^2}{n_2}}}, \quad z_c = 1.645$

b. $E = \dfrac{t_c s_d}{\sqrt{n}}, \quad t_c = 1.645$

c. $E = t_c \sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}, \quad t_c = 1.895$

d. $t = \dfrac{\overline{x}_1 - \overline{x}_2}{\sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}}, \quad t_c = 1.895$

e. none of the above

……

73. A lavender shrub produces a mean of 450 grams of flowers , with population standard deviation 51 grams. A sample of 22 of these shrubs were given an organic fertilizer and produced a mean of 489 grams of flowers. A hypothesis test is done to determine whether this is an increase. The formula used for the test statistic is

a. $z = \dfrac{\overline{x}_1 - \overline{x}_2}{\sqrt{\dfrac{\sigma_1^2}{n_1} + \dfrac{\sigma_2^2}{n_2}}}$

b. $z = \dfrac{\overline{x} - \mu}{\dfrac{\sigma}{\sqrt{n}}}$

c. $t = \dfrac{\overline{x}_1 - \overline{x}_2}{\sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}}$

d. $t = \dfrac{\overline{x} - \mu}{\dfrac{\sigma}{\sqrt{n}}}$

e. none of the above

……

A company has to choose among three pension plans. Management wishes to know whether the preference for plans is independent of job classification. The opinion for a random sample of 500 employees showed the following counts for each Plan and Job Classification. Consider the hypothesis test represented by this Minitab output, in which some numbers have been deleted.

```
Expected counts are printed below observed counts
Chi-Square contributions are printed below expected counts

                    Pension Plan   Pension Plan   Pension Plan    Total
                               1              2              3
Salaried Workers             160            140             40      340
                          136.00            136          68.00
                            ****          0.118           ****

Hourly Workers                40             60             60      160
                            ****          64.00          32.00
                           9.000          0.250         24.500

Total                        200            200            100      500

Chi-Sq =****, DF =****, P-Value =****
```

74. The alternate hypothesis states the following.

a. The Job Classification fits the distribution of the preferred Pension Plan.
b. The Job Classification does not fit the distribution of the preferred Pension Plan.
c. The preferred Pension Plan and Job Classification are independent.
d. The preferred Pension Plan and Job Classification are not independent.
e. The preferred Pension Plan and Job Classification have normal distribution.

75. The expected number of Hourly Workers preferring Plan 1 is

a. 40
b. 64
c. 9
d. 200
e. 160

76. The total contribution to the chi-square test statistic from Salaried Workers who prefer Pension Plans 1 and 3 is

a. 204.00
b. 200.00
c. 4.235
d. 15.764
e. 0.118

77. The number of degrees of freedom is

a. 2
b. 3
c. 1
d. 4
e. 6

78. The χ^2 test statistic is:

a. 33.868
b. 49.633
c. 0.680
d. 500
e. Cannot be calculated from the information provided.

79. The P-value is

a. P-Value < 0.005
b. P-Value > 0.995
c. 0.950 < P-Value < 0.975
d. 0.005 < P-Value < 0.01
e. Cannot be determined because the alternate hypothesis is not known.

80. At 1% level of significance,

a. the null hypothesis is not rejected. Therefore, Pension Plan preference and Job Classification are independent.
b. the null hypothesis is rejected. Therefore, Pension Plan preference and Job Classification are independent.
c. the null hypothesis is rejected. Therefore, Pension Plan preference and Job Classification are not independent.
d. the null hypothesis is not rejected. Therefore, Pension Plan preference and Job Classification are not independent.
e. both null and alternate hypotheses are rejected.

……

Have you shaded in the circles correctly for your student number? (That is the only way your mark can be assigned to you.)
Have you used pencil ? (Pen is invisible to the scantron reader)
Is your name on both this exam paper and on the scantron?