جامعة الملك سعود	الاختبار النهائي
كلية العلوم	الفصل الأول ١٤٣٤ / ١٤٣٥
قسم الإحصاء وبحوث العمليات	مقرر: ٥٠٠ حين

الأحد: ٢٦ / ٢ / ١٤٣٥ هـ **الوقت: ٩-١٢**

اســم الطـــالبة:----------

رقم الشـــــعبة:----------

الرقم المتسلسل:----------

مـــدرس المادة: ----------

Choose one answer for each question, then write the letter of the chooses answer in the box below

Question	1	2	3	4	5	6	7	8	9	10
Answer										

Question	11	12	13	14	15	16	17	18	19	20
Answer										

Question	21	22	23	24	25	26	27	28	29	30
Answer										

Question	31	32	33	34	35	36	37	38	39	40
Answer										

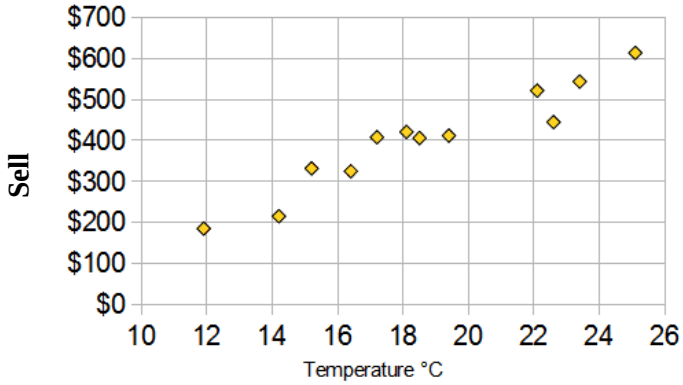
Question	41	42	43	44	45	46	47	48	49	50
Answer										

Good Luck

Dr. Saba Alwan

Question (1)

The local ice cream shop keeps track of how much ice cream they sell versus the temperature on a day . They collected data for the last 12 days and here is the data as a Scatter Plot.



1- The relation between these two variables are

(a) Perfect positive correlation (b) low negative correlation (c) No correlation.
(d) High positive correlation (e) Perfect negative correlation

2- If we draw the line of the linear regression, what is the best equation for this line

(a) $\boldsymbol{Sell} = \textbf{temperature} + 180$ (b) $\boldsymbol{Sell} = -0.80 * \textbf{temperature} + 180$

(c) $\boldsymbol{Sell} = 0.95 * \textbf{temperature} - 180$ (d) $\boldsymbol{Sell} = 0.95 * \textbf{temperature} + 180$ (e) None of these

Question (2)

Let **X** represents the **daily times of eating a specific type of chocolate which takes the values =(0,1,2,5,6)** and **Y** represents the **daily weight (in kg)** of a sample of **15** children. If you regress **Y** on **X** and get the following regression equation: $\hat{\boldsymbol{Y}} = \boldsymbol{0.5X + 25.3}$, **then**

3- The relation between X and Y is

(a) Linear positive (b) Linear negative (c) No linear relation

4- If the number of times of eating the chocolate decreases by 2, then the expected daily weight will

(a) Decreased by 0.5 kg. (b)Increased by 0.5 kg.
(c) Decreased by one kg (c) Increased by one kg (e) None of these

5- If there is <u>no</u> eating the specific chocolate in a day , then the daily weight of a children will be

(a) Increased by **0.5 kg.** (b) Decreased by **0.5 kg**. (c) **25.3 kg**
(c) Decreased by **25.3 kg** (e) None of these

6- What the expected daily weight of a children if he eat the chocolate 4 times in a day

(a) 30.3 kg. (b) 25.3 kg. (c) 25.8 kg (c) 27.3 kg (e) None of these

7- What the expected daily weight of a children if he eat the chocolate 10 times in a day

(a) 30.3 kg. (b) 25.3 kg. (c) 25.8 kg (c) 27.3 kg (e) None of these

Question (3)

To test whether the mean of a population is significantly differs from **50**, we take a sample of **40** person, then

8- The hypothesis that will be tested can be written as

(a) $H_0: \mu = 50 \quad V.s \quad H_1: \mu > 50$ (b) $H_0: \mu = 50 \quad V.s \quad H_1: \mu < 50$

(c) $H_0: \mu = 50 \quad V.s \quad H_1: \mu \neq 50$ (d) $H_0: \mu > 50 \quad V.s \quad H_1: \mu < 50$

9- The appropriate test is

(a) One way analysis of variance (b) Two way analysis of variance
(b) One sample t test (c) Tow paired sample t test (d) Significance of regression

If the result of the appropriate test by SPSS package is given below

	Test Value = 50					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
writing score	4.140	199	.000	2.7750	1.4533	4.0967

10- The statistical decision is: (a)Reject H_0 (b) Accept H_0

11- Do you need to test the normality of the given data?

(a) yes (b) No

12- In order to dispense the normality condition, we can apply procedure

(a) Take two paired samples than compare (b) Take a sample size more than 30.
(b) Take two independent samples than compare. (e) Put the homogeneity condition rather than the normality condition. (e) None of these.

Question (4)

Suppose that we want to determine if the patients in two departments in a hospital having a different mean of hemoglobin level.

We will follow our customary steps: (α =0 .05)

13- The null and alternative hypotheses are

(a) H_0: $\mu_{Hospital\ 1} = \mu_{Hospital\ 2}$ v.s H_1: $\mu_{Hospital\ 1} \neq \mu_{Hospital\ 2}$

(b) H_0: $\mu_{Hospital\ 1} = \mu_{Hospital\ 2}$ v.s H_1: $\mu_{Hospital\ 1} > \mu_{Hospital\ 2}$

(c) H_0: $\mu_{Hospital\ 1} = \mu_{Hospital2}$ v.s H_1: $\mu_{Hospital\ 1} < \mu_{Hospital\ 2}$

(d) H_0: $\mu_{Hospital\ 1} > \mu_{Hospital\ 2}$ v.s H_1: $\mu_{Hospital\ 1} < \mu_{Hospital\ 2}$

(e) None of these

14- The appropriate statistical test procedure is

(a) One way analysis of variance (b) Independent samples T test
(c) Two way analysis of variance (d) One sample T test (e) Tow paired sample T test

If the SPSS result of the appropriate test is given by the table below, then

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Score	Equal variances assumed	.006	.942	2.514	10	.031	3.5000	1.39244	.3975	6.603
	Equal variances not assumed			2.514	9.941	.031	3.5000	1.39244	.3949	6.605

15- If the data is homogeneous, then the significance level (P-value) is

(a) 0.776 (b) 0.942 (c) -1.180 (d) 0.031 (e) None of these

16- The statistical decision is

(a)Reject H_0 (Accept H_1) (b) Accept H_0 (Reject H_1)

If we want to test the **homogeneity** of the two samples (i.e. H_0: $\sigma^2_{Hospital\ 1} = \sigma^2_{Hospital\ 2}$ $v.s$ $\sigma^2_{Hospital\ 1} \neq \sigma^2_{Hospital\ 2}$), for this test **and** according the result by SPSS that be given above:

17- The significance level (P-value) is

(a) 0.776 (b) 0.942 (c) -1.180 (d) 0.031 (e) None of these

18- The decision at our level significance is

(a)Reject H_0 (Accept H_1) (b) Accept H_0 (Reject H_1)

Question (5)

Suppose that we want to determine if the students have different numbers of younger and older siblings.

We will follow our customary steps:

19- The null and alternative hypotheses are

(a) H_0: $\mu_{older} = \mu_{younger}$ v.s H_1: $\mu_{older} \neq \mu_{younger}$

(b) H_0: H_0: $\mu_{older} = \mu_{younger}$ v.s H_1: $\mu_{older} > \mu_{younger}$

(c) H_0: H_0: $\mu_{older} = \mu_{younger}$ v.s H_1: $\mu_{older} < \mu_{younger}$

(d) H_0: $\mu_{older} > \mu_{younger}$ v.s H_1: $\mu_{older} < \mu_{younger}$

(e) None of these

20- the appropriate statistical test is

(a) One way analysis of variance (b) Two way analysis of variance
(b) One sample t test (c) Tow paired sample t test (d) Independent samples t test

If the result of the **appropriate** test is given by the table below, then

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Number of Older Siblings - Number of Younger Siblings	.111	1.980	.295	-.484	.706	.377	44	.708

21- The significance level (P-value) =

(a) 0.111 (b) 0.295 (c) 0.708 (d) 0.377 (e) None of these

22- The statistical decision is

(a) Reject H_0 (Accept H_1) (b) Accept H_0 (Reject H_1)

23- For each of the following examples, you would use a paired t-test.

I- Comparing the average height of men and women.

II- Comparing the weight of group before and after a diet**.**

III- Comparing patients given drug-A with those given drug-B**.**

IV- Comparing patients given a drug with those not given.

(a) I and II (b) III and IV (c) I only (d) II only (e) III only

24- For testing whether a specific drug has a good effect in reducing the mortality of a specific type of insects, after a month of drug use , we measure the difference means of number of deaths for a sample that is taking the drug and for a control sample and get the following result:

$\mu_{drug} - \mu_{No.drug} = -6$	**P-value = 0.4**

What can you conclude from this fact.

(a) The drug has a good effect in reducing the mortality.

(b) The drug has not a good effect in reducing the mortality.

(c) The drug has a good effect in reducing the mortality, but this effect is not significance.

(d) The drug has not a good effect in reducing the mortality, but this not effect is not significance.

Question (6)

A researcher wants to study whether there is a significant effect of changing the concentration of a drug on recovering from a specific disease. He count the days that are taken to recovering from the disease for each patient and under the effect of the concentration. **3** patient are in each group. The result is given below:

Concentrations	**days that are taken to recovering from the disease**		
CON10%	**48**	**47**	**55**
CON20%	**64**	**64**	**55**
CON30%	**52**	**49**	**55**
CON40%	**41**	**44**	**50**

25- To test if there is a significant effect of changing the concentration, we can use

(a) Tow ways analysis of variance (b) One way analysis of variance
(c) Simple regression (d) One sample t test (e) Tow paired sample t test

26- Before make the appropriate test, we must test

(a) Normality of the data (b) Homogeneity of the data
(c) Normality and Homogeneity of the data (d) Significance of the regression (d) One sample t test

If the result of the appropriate test by SPSS is given bellow

ANOVA

NO.OFDAYS

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	402.000	3	134.000	7.053	.012
Within Groups	152.000	8	19.000		
Total	554.000	11			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: NO.OFDAYS

Tukey HSD

(I) CONS	(J) CONS	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
CON10%	CON20%	-11.000-	3.559	.059	-22.40-	.40
	CON30%	-2.000-	3.559	.941	-13.40-	9.40
	CON40%	5.000	3.559	.530	-6.40-	16.40
CON20%	CON10%	11.000	3.559	.059	-.40-	22.40
	CON30%	9.000	3.559	.129	-2.40-	20.40
	CON40%	16.000*	3.559	.009	4.60	27.40
CON30%	CON10%	2.000	3.559	.941	-9.40-	13.40
	CON20%	-9.000-	3.559	.129	-20.40-	2.40
	CON40%	7.000	3.559	.276	-4.40-	18.40
CON40%	CON10%	-5.000-	3.559	.530	-16.40-	6.40
	CON20%	-16.000-*	3.559	.009	-27.40-	-4.60-
	CON30%	-7.000-	3.559	.276	-18.40-	4.40

*. The mean difference is significant at the 0.05 level.

27- Your conclusion is

(a) There is **an effect** of changing the concentration of a drug.

(b) There is **a significance effect** of changing the concentration of at α=0.05

(c) There is **no** effect of changing the concentration of a drug.

(d) There **is no significance effect** of changing the concentration of at α=0.05

(e) None of these

28- If there are a significance effect of changing the concentration , this effect comes from

(a) CON10% and CON20% **(b) CON10% and CON30%** **(c) CON10% and CON40%**

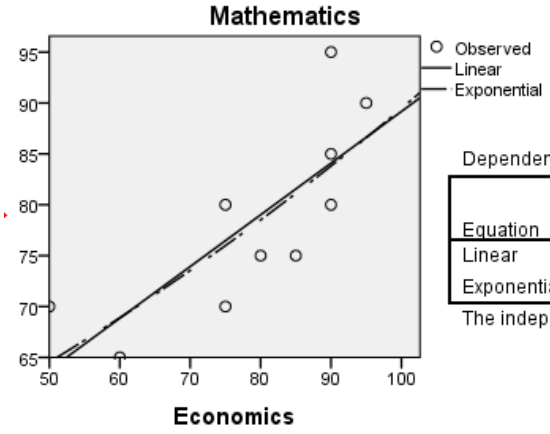
(d) CON20% and CON30% **(e) CON20% and CON40%** **(f) CON30% and CON40%**

29- The tests that are in Post Hoc table is called

(a) Tow ways analysis of variance (b) One way analysis of variance (c) Simple regression
(d) One sample t test (e) Independent sample T test. (f) None of these

Question (7)

According the following SPSS result of Regression coefficients.



Model Summary and Parameter Estimates

Dependent Variable: Mathematics

Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b1
Linear	.608	12.389	1	8	.008	38.373	.508
Exponential	.631	13.669	1	8	.006	46.563	.007

The independent variable is Economics.

30- The linear relationship between Mathematics and Economic is

(b) Economic = 38.373 + 0.508* Mathematics (a) Mathematics = 38.373 + 0.508 *Economic

(a) Mathematics = 0.508+ 38.373* Economic (b) Economic = 0.508+ 38.373* Mathematics

31- The Exponential relationship between Mathematics and Economic is

(a) $Economic = 46.563 * e^{0.007\ Mathematics}$ (b) $Mathematics = 46.563 * e^{0.007\ Economic}$

(c) *b*) $Mathematics = 0.007 * e^{46.563\ Economic}$ (d) $Economic = 0.007 * e^{46.563\ Mathematics}$

32- Which of the two models is significance at level= 0.05

(a) The linear model (b) The exponential model (c) Both models

Question (8)

Dose there is a relationship between the marks of **10** student in courses **Mathematics and Statistics**?

33- To answer this question you must used

(a) Tow ways analysis of variance (b) One way analysis of variance (c) Simple regression
(d) Correlation coefficient (e) Independent sample T test. (f) None of these

34- Before doing your procedure you must test

(a) Normality of **Stat**. data (b) Normality of **Math**. data (c) Normality of **both Stat**. and **Math**. data
(d) Homogeneity of **Stat**. data (e) Homogeneity of **Math**. data (f) Homogeneity of **both Stat**. and **Math**. data

35- If the data is normal distributed, you can use

(a) Person coefficient **(b) Kendal** coefficient (c) **Spearman** coefficient (d) **Kendal or Spearman** coefficients

36- If the data is not normal distributed, you can use

(a) Person coefficient **(b) Kendal** coefficient (c) **Spearman** coefficient (d) **Kendal or Spearman** coefficients

According the following SPSS result of correlation coefficients.

Correlations

		Mathematics	Statistics
Mathematics	Pearson Correlation	1	.959**
	Sig. (2-tailed)		.000
	N	10	10
Statistics	Pearson Correlation	.959**	1
	Sig. (2-tailed)	.000	
	N	10	10

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

Control Variables			Mathematics	Statistics
Economics	Mathematics	Correlation	1.000	.905
		Significance (2-tailed)	.	.001
		df	0	7
	Statistics	Correlation	.905	1.000
		Significance (2-tailed)	.001	.
		df	7	0

37- The partial correlation between "'Mathematics" and "Statistics" is

(a) 0.487 (b) 0.959 (c) 0.905 (d) 0.185 (e) 0.184

38- Person correlation between "'Mathematics" and "Statistics" is

(a) 0.487 (b) 0.959 (c) 0.905 (d) 0.185 (e) 0.184

39- The effect of variable " Economics " on the correlation between "'Mathematics" and "Statistics" is

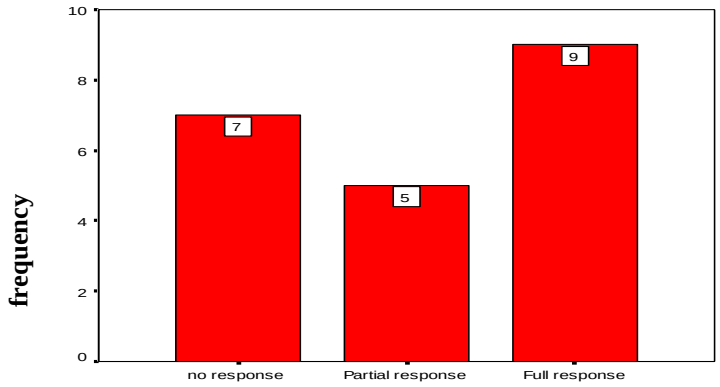
(a) Positive (b) Negative (d) No effect

40- Which of the correlation coefficients is purest and most accurate

(a) 0.487 (b) 0.959 (c) 0.905 (d) 0.185 (e) 0.184

Question (9)

For a sample of patients with a specific disease, the level of the response after the treatment is shown in the following chart



41- The **type** of variable is

(a) Quantitative discrete (b) Quantitative continuous (c) Bar chart

(d) Qualitative (e) none of these

42- The name of the chart is

(a) Bar Chart (b) Histogram (c) Polygon (d)curve (d) none of these

43- The **sample size** is

(a) 10 (b) 9 (c) 12 (d) 21 (e) none of these

44- The **mode** is

(a) 7 (b) 5 (c) 9 (d) no response (e) Partial response (f) Full response

45- The **number of patient** with **full response** after a fixed course of treatment is

(a) 14 (b) 5 (c) 0.43 (d) 9 (e) none of these

Also, according the result by SPSS Package

46- The mean of Mathematics is

(a) 78.5 (b) 82.6 (c) 78.5 (d) 82.5 (e) 70 (f) 85

47- The median of Statistics is

(a) 78.5 (b) 82.5 (c) 78.5 (d) 82.5 (e) 70 (f) 85

48- The C.V of Statistics is

(a) 8.9% (b) 6.7% (c) 50% (d) 12% (e) 7% (f) 5.9%

49- The C.V of Mathematics is

(a) 8.9% (b) 6.7% (c) 50% (d) 12% (e) 7% (f) 5.9%

Statistics

		Mathematics	Statistics
N	Valid	10	10
	Missing	0	0
Mean		78.50	82.60
Median		77.50	82.50
Mode		70[a]	85
Std. Deviation		9.443	7.412
Variance		89.167	54.933
Skewness		.416	.134
Std. Error of Skewness		.687	.687
Kurtosis		-.569-	-.086-
Std. Error of Kurtosis		1.334	1.334
Range		30	25

a. Multiple modes exist. The smallest value is shown

50- Which courses is more variation

(a) Mathematics (b) Statistics (d) The same

End The questions