

University of Damascus
Faculty of Sciences/4th Year - Department of Statistics
English for Statisticians

ملاحظة للسادة المراقبين: مسموح استعمال الآلات الحاسبة

Time: 1.30 hours, Four questions, Date: February – 2025

D) Choose the best answer for each question: (5 marks each)

- 1) D: The serum is effective
- 2) D: is not legitimate
- 3) B
- 4) C
- 5) D: $x=20$
- 6) D: scatter
- 7) D: $\bar{x}=\bar{x}'+h, \bar{y}=\bar{y}'+k$
- 8) B
- 9) D
- 10) A

II) Translate into Arabic

- 1) (5 marks) Third moment of a random variable.
العزم الثالث لمتحول (متغير) عشوائي
- 2) (10 marks) We test the hypothesis that a coin is fair.
نختبر فرضية كون قطعة النقد عادلة

III) Translate into English

- 1) (5 marks)
تعتبر نظرية المعاينة (أخذ العينات) أن جميع العينات مستقلة عن بعضها البعض.
Sampling Theory considers all the samples are independent amidst themselves.
- 2) (10 marks)
يمكن تعميم أفكار تحليل التباين الخاصة بتجارب العامل الواحد
The ideas of analysis of variance for one-factor experiments can be generalized

IV) Solve the following. (20 marks, 5 for each question)

The following Table shows the observed frequencies in tossing a die 120 times. We would like to test the hypothesis that the die is fair, using a significance level of 0.05.

Face	1	2	3	4	5	6
Observed Frequency	25	17	15	23	24	16
Expected Frequency if die is fair	x	x	x	x	x	x

1) What is the sum of all expected frequencies?

120

2) What is the value of χ^2 test?

$\chi^2 = 5$

3) What is the number of degrees of freedom ν in the χ^2 test?

$\nu = k - 1 = 6 - 1 = 5$

4) Knowing that the χ^2 critical value, at the 5% significance level, for the corresponding number of degrees of freedom is 11.1, give the conclusion of testing the hypothesis of fairness of die.

$5 < 11.1 \rightarrow$ hypothesis is not rejected

Nidal CHAMOUN & Lilas ALHAMOUI