# REVIEW & EXAMPLES OF THEORETICAL EXAM

Sorana D. Bolboacă

### **OUTLINE**

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- About theoretical exam
- About the final mark
- About the second theoretical assignment
- Topics on theoretical exam
- Example of theoretical exam

Article 78. Students are allowed to attend the examination for a specific discipline only once per each examination session.

- Article 79. (1) Students are allowed to attend the examination for a specific discipline no more than three times during an academic year.
  - (2) The curriculum includes four examinations sessions for the linear tuition program: the winter session, the summer session and two reexamination sessions.
  - (3) In case of linear tuition program, students can attend the exam as follows:
    - the first submission in the examination session occurring at the end of the course;
    - the second submission in the next examination session: the summer session if there will be an exam in that academic subject (for subjects with examination in the winter session) or the first reexamination session.
    - the third submission in the second reexamination session.

- (6) In this regard, absence from an exam scheduled for that series, without duly justified reasons approved by the Council Board of the Faculty, results in the loss of one opportunity of taking that exam, therefore diminishing the number of possible submissions.
- (8) Students who have an excuse for their absence from the examination, approved by the Council Board of the Faculty, benefit from all the possibilities to submit that examination.

Article 100. Students come to the exam with their student report card (or temporary certificate from the Dean's Office) and their ID (or passport). On entering the examination classroom, the examiners identify the students based on these documents.

- Article 102. (1) Bags, outdoor clothes and mobile phones are stored in the locations specified by the supervising teachers and not near to the students.
  - (2) Cell phones must be turned off when entering the examination classroom and stay that way throughout the examination; they can only be turned on again after leaving the examination classroom.
  - (3) During the exam, students are not allowed to carry cell phones or other electronic devices enabling interpersonal communication and information access.

- Article 103. (1) Students must carry a pen or pencil and other admissive stationery necessary for exam submission.
  - (2) Any request or question can only be addressed with a loud voice only to the supervising teachers.

Article 105. During the examination, communication between students is forbidden.

- Article 108. (1) On leaving the classroom, students must hand the written papers and all their signed sheets.
  - (2) Upon completion of the written exam, students must sign for the delivering of their written paper.

### **EXAM SCHEDULING**

01. Februarie 2016 - 07. Februarie 2016

01. Februarie 2016 - 07. Februarie 2016

08:30am - 12:30pm EXAM Info MG EN S1de catre Andrada Urda :: Examene

02. Februarie

09:00am - 11:00am Examen Info MG FRde catre Daniel Leucuta :: Examene

04. Februarie

08:30am - 12:30pm Exam Info MG Eng S2de catre Sorana Bolboaca :: Examene

05. Februarie

09:00am - 01:00pm Examen Biochimie RO2de catre Tudor Drugan :: Examene

#### EXAM Info MG EN S1

Luni, 1. Februarie 2016, 08:30am - 12:30pm

8.30-10.30: gr. 5, 6, 7, 8

10.30-12.30: gr. 1, 2, 3, 4

#### Exam Info MG Eng S2

Joi, 4. Februarie 2016, 08:30am - 12:30pm

8:30-10:30: group 9, 10, 11, 12

10:30-12:30: group 13, 14, 15, 16

### FINAL MARK

- Your course grade will be based on a weighted average of your marks as indicated bellow:
  - Practical exam (30%) & Theoretical exam (70%)
- Article 116. (1) Student knowledge assessment is noted from 1-10.
  - (2) A discipline is promoted when the final mark, from both theoretical and practical exam, is at least 5.
  - (3) Marks below 5 bring about the student's reexamination in the exam task he/she did not promote, in a future session.

Practical		Written score	Written mark	Mean	Final
	3.75	23.5	7.04	4	4
	3.75	20.25	6.21	4	4
	3.25	17.25	5.44	4	4
	8.25	20.25	6.21	6.82	7

### LECTURES AND PRACTICAL ACTIVITY EVALUATION

- Personal: on my webpage
  - When? After the theoretical exam
- University: <a href="https://eval.umfcluj.ro/">https://eval.umfcluj.ro/</a>
  - When? Until January 24, 2014

Monday, 04 January 2016 15:16

The evaluation of the didactic activity by the students - sem I

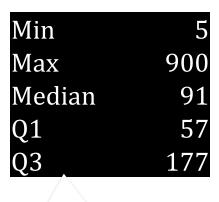
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THE EVALUATION PROCESS FOR THE CURRENT SEMESTER WILL TAKE PLACE FOLLOWING THE SPECIFIED DEADLINES: 04 – 24 JANUARY 2016 (available for all students)

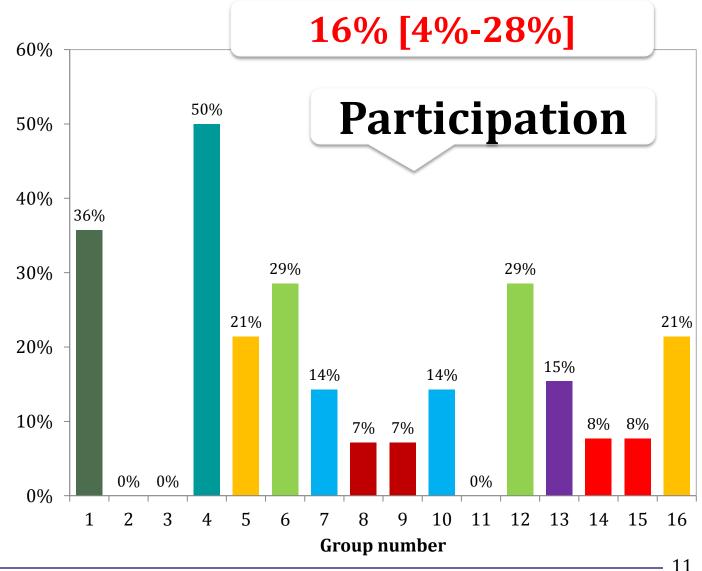
We invite you to fill out the Lecture Evaluation Forms and the Practical Work Evaluation Forms which can be accessed at the following address: https://eval.umfcluj.ro. To access your own account you should take the following steps:

- Information: storage upload download & operation (binary: memories, optical disc, etc. vs. decimal: HDD, memory stick, etc.)
- Descriptive statistics: statistical series & graphical representation & calculation of centrality parameters, coefficient of variation (+ interpretation) & recognition of normal distribution
- Probabilities: operations and probabilities & calculation of conditional probabilities & conditional probabilities for diagnosis (Se, Sp, PPV, NPV) and risk factors (RR, OR + interpretation) & construction of contingency table based on enunciation
- Probability distributions: problems
- Confidence intervals: calculation for mean, difference between two means, frequency and difference between frequencies + interpretation
- Statistical tests: statistical hypotheses & computation of the test statistic & computation of degrees of freedom & interpretation of Z-test, t-test for independent samples (independent samples choose based on the results of variance tests Levene or Barlett), paired t-test
- Statistical test: statistical hypotheses & interpretation for test of normality, ANOVA, Mann-Whitney, Wilcoxon, Kruskal-Wallis
- Correlation and regression analysis: choosing the proper correlation coefficient (Pearson vs. Spearman), interpretation of correlation coefficient (Colton rules and statistical test of significance)

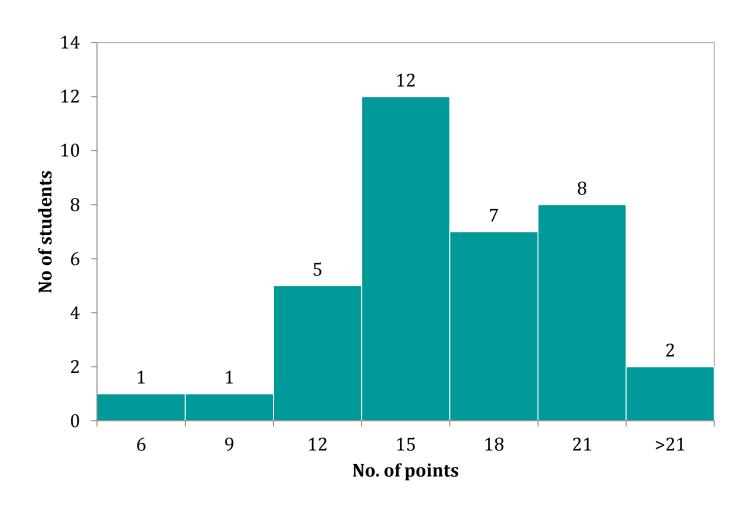
## **Second Theoretical Assignment**



**Timing** 



# **Second Theoretical Assignment**



# **Second Theoretical Assignment**

- A sample of 15 cervical cancer-cases and 12 controls, aged between 35 and 45 years old was investigated. 11 of the cervical cancer-cases and 5 of the controls had at least one Chlamydia infection (considered as risk factor for cervical cancer). What are the values of TP(True Positive)-FP(False Positive)-FN(False Negative)-TN(True Negative) in the theoretical table!
- A study was conducted to measure the effect of mother alcohol consumption upon the birth weight of a baby. The following variables were measured for each woman included in the study: alcohol consumption status (yes/no), baby birth weight (g), and APGAR score. The scales of these variables are!

#### Directions:

- This exam contains 35 multiple choice questions, each worth 1 point.
- Each question is followed by five possible answers. You should choose the best answer from the stated alternatives and fill it properly
  on the answer sheet. Please use a marker or a pencil (black or blue) to fill the answer sheet.
- You may use a non-programmable calculator if you wish. However, cell phones, iPhones, lped, tablet, etc. are not permitted for use in any way.
- Any discussion or otherwise inappropriate communication between students, as well as the appearance of any unnecessary material
  or cell-phone usage, will be considered fraud (cheating). Violations may result in an exclusion from the test.
- Please print your full name in CAPITALS on both answer sheet and question booklet.
- All papers must be handed in on the completion of this examination. This includes answer sheet, question booklet, formula sheet, and all other provided sheets.

Total Time (including reading): 75 minutes

#### Good Luck!!!

Varianta 1

- The cholesterol level on a sample of 600 patients was tested for normality. Chi-Square goodness of fit test was used and a p-value of 0.0004 was obtained. The following is correct:
- a) The comparison of the sample mean among a population mean is proper
- b) Data are not normally distributed
- c) Kolmogorov-Smirnov is the proper test
- d) The Chi-Square goodness of fit is not the proper test to be used
- e) Data are normally distributed

- 4) The values of systolic blood pressure measured in mmHg for a sample of 10 patients are as follows: 120, 100, 110, 120, 130, 160, 130, 120, 140, and 160. The arithmetic mean is equal to:
- a) 110
- b) 130
- c) 129
- d) 135
- e) 120

. . . . .

Universitatea de Medicină și Farmacie "Iuliu Haţieganu" Cluj-Napoca

### Catedra de Informatică Medicală

Facultate, an, grupă:\_\_\_\_\_\_

Numele:\_\_\_\_

Prenumele:\_\_\_\_\_

Data examenului:\_\_\_\_\_\_(completati cu majuscule)

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14	00000	6
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Varianta chestionar de examinare	
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2 O 3 O 4 O	

- 3. It is seeks to estimate the prevalence of smoking among students from "Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca. A random sample of students was selected and each student was asking to complete an anonymous questionnaire. In this study, the answer of Yes/No type give by each student to the question "Do you smoke?" represent:
  - A. Data
  - B. Statistics
  - C. Variable
  - D. Parameter
  - E. Sample

- The following variables are of qualitative type on nominal scale, EXCEPT:
  - A. Gender (F = female, M = male)
  - County of residence (e.g.: Cluj, Sălaj, Maramureş, Bistriţa-Năsăud, Alba, Mureş, Bihor, etc.)
  - Marital status (married, unmarried, divorced, widowed)
  - The frequency with which relies on a certain health care services (never, very rarely, rarely, often, very often)
  - E. Blood type (0, A, B, AB)

- 6) \* If the value of a variable are in the form of counts such as number of episodes of a disease per patient during one year, such a variable is:
- a) Discrete
- b) Ordinal
- c) Interval
- d) Nominal
- e) Continuous
- 4) Which of the following examples are constants?
- a) Number of days in August
- b) The age of patients hospitalized in the Department of Traumatology
- c) Number of consultations per week of a specialized ambulatory health care service
- d) Maximum value of Apgar score
- e) The highest value of Glasgow score

- 4. A survey of a popular seaside community (population = 1,225) found the local inhabitants to have usually elevated blood pressures. In this survey, just over 95% of the population has systolic between 110 and 190. Assuming a normal distribution for blood pressure values, the standard deviation for systolic blood pressure in this seaside community is most likely
  - A. 10
  - B. 20
  - C. 30
  - D. 40
  - E. 50
- 10. On evaluating a new diagnosis test, given that a positive result is obtained through the new test, the probability that the tested patient will be truly diseases is given by?
  - A. Sensitivity
  - B. Specificity
  - C. Positive predictive value
  - Negative predictive value
  - E. None

- 24) \*Suppose that the p-value in a hypothesis test is 0.08. If the significance level for the test is  $\alpha = 0.05$ , which of the following is the appropriate decision?
- a) Fail to reject H<sub>0</sub>
- b) Reject H<sub>o</sub>
- c) There is not enough information given to know whether or not H<sub>0</sub> should be rejected
- d) Fail to reject H<sub>a</sub>
- e) Reject H<sub>a</sub>

- 33) \* The aim of \_\_\_\_\_\_ test is to compare the arithmetic mean of a continuous variable on a representative sample extracted with a known mean (population mean) under the assumption of equality of variance.
- a) Z
- b) T
- c) ANOVA
- d) Paired t
- e) Could not be determined based on provided data

17. The 99% confidence interval ( $Z_{\alpha}$  = 2.579) associated to systolic blood pressure for a sample of 169 persons with an arithmetic mean of 135 mg/dl and a standard deviation of 20 mg/dl is:

- A. [132 138]
- B. [132 138]
- C. [83 187]
- D. [131 139]
- E. Could not be determined based on provided data

25. Two therapeutic schemas (A and B) are widely used to treat a certain type of bacterial disease. To compare the success rates of the two procedures, a random sample from each type of schema was obtained (A with a sample size of 160 and B with a sample size of 120), and the number of patients with no reoccurrence of the disease after 1 year was recorded (106 for A schema and 104 for schema B). The number of patients with reoccurrence for B schema is:

- A. 106/160
- B. 104/120
- C. 16/120
- D. 54/160
- E. 210/280

23. A psychologist postulates that the occurrence of speech defects in elementary school children is related to their socioeconomic background. A sample of children from each of three socioeconomic groups (upper-income, middle-income, and low-income) was selected and records the number of children between ages of 6 and 12 in each group with a speech defect. In analysing the data collected in the study a chi-square test statistic of 1.1 was obtained (tabulated critical value for the significance level of 5% is 5.99). How many degrees of freedom are associated with the test statistic:

- A. 1
- B. 2
- C. 4
- D. 6
- E. Cannot be determined based on provided data

- 33. A sample of 75 ovarian cancer-cases and 120 controls, aged between 40 and 50 years old was investigated. 40 of the ovarian cancer-cases and 45 of the controls had an age at menarche (age when periods begin) of less than 11 years. What test can be used to assess if there is a significant association between early age at menarche and ovarian cancer?
  - A. Student t-test
  - B. Chi-square test
  - C. Regression analysis
  - D. ANOVA test
  - E. Kolmogorov-Smirnov test

- 3. Drinking coca cola (daily) is suspected to be associated with apparition of tooth caries. A sample of 500 persons was studied: 220 presented at least one caries and from these 100 reported to be coca-cola drinkers. A number of 210 patients without caries and no coca-cola drinkers were identified. The alternative hypothesis of the test could be:
  - A. No answer is correct
  - B. Daily coca-cola drinking and tooth caries are dependent
  - There is an association between tooth caries and daily coca-cola drinking
  - Daily coca-cola drinking and tooth caries are independent
  - E. Tooth caries and daily coca-cola dinking are not associated

26) \* Two therapeutic schemas (A and B) are widely used to treat a certain type of bacterial disease. To compare the success rates of the two procedures, a random sample from each type of schema was obtained (A with a sample size of 160 and B with a sample size of 120), and the number of patients with no reoccurrence of the disease after 1 year was recorded (106 for A schema and 104 for schema B). The failure rate when the A therapeutic schema was used is:

- a) 0.6625
- b) 0.3375
- c) 0.8667
- d) 0.1333
- e) 0.7514

- 11) Blood cholesterol level of patients between 21 and 40 years with insulin-dependent diabetes is normally distributed with a mean of 140 mg/dl and a standard deviation of 36 mg/dl. A mean of 168 mg/dl with a standard deviation of 36 mg/dl was obtained on a normally distributed sample of 81 patients aged between 21 and 40 years with insulin-dependent diabetes. The value of the applied statistical test is equal to:
- a) 14
- b) 7
- c) 0.09
- d) 167.57
- e) 0.7



'These things will become clear to you,' said the old man gently, 'at least,' he added with slight doubt in his voice, 'clearer than they are at the moment.'

**Douglas Adams** 

'Today's truths become errors tomorrow.'
Ursula K. Le Guin