



Personal Data

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| Family Name: |
| Given Name: |
| Signature: |
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Registration Number

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In this section **no** changes or modifications must be made!

Scrambling

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Type

005

Exam ID

20101500003

Please mark the boxes carefully: ☒ Not marked: ☐ or ☐

This document is scanned automatically. Please keep clean and do not bend or fold. For filling in the document please use a **blue or black pen**.

Only clearly marked and positionally accurate crosses will be processed!

Answers 1 - 4

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| | a | b | c | d | e |
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| 4 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | a | b | c | d | e |



1. (2.5 points) Which of the following cities are the capital of the corresponding country?
 - (a) Zurich (Switzerland)
 - (b) Auckland (New Zealand)
 - (c) Riyadh (Saudi Arabia)
 - (d) Tokyo (Japan)
 - (e) Sao Paulo (Brazil)
2. (2.5 points) The waiting time (in minutes) at the cashier of two supermarket chains with different cashier systems is compared. The following statistical test was performed:

Two Sample t-test

```
data: Waiting by Supermarket
t = 1.905, df = 147, p-value = 0.9706
alternative hypothesis: true difference in means is less than 0
95 percent confidence interval:
    -Inf 2.023231
sample estimates:
mean in group Sparag mean in group Consumo
      7.261352          6.178791
```

Which of the following statements are correct? (Significance level 5%)

- (a) The absolute value of the test statistic is larger than 1.96.
 - (b) A one-sided alternative was tested.
 - (c) The p-value is larger than 0.05.
 - (d) The test shows that the waiting time is longer at Sparag than at Consumo.
 - (e) The test shows that the waiting time is shorter at Sparag than at Consumo.
3. (2.5 points) In a small city the satisfaction with the local public transportation is evaluated. One question of interest is whether inhabitants of the city centre are more satisfied with public transportation compared to those living in the suburbs.
A survey with 250 respondents gave the following contingency table:

| | Location | |
|------------|-------------|---------|
| Evaluation | city centre | suburbs |
| very good | 22 | 7 |
| good | 40 | 36 |
| bad | 31 | 59 |
| very bad | 7 | 48 |

The following table of percentages was constructed:

| | Location | |
|------------|-------------|---------|
| Evaluation | city centre | suburbs |
| very good | 75.9 | 24.1 |
| good | 52.6 | 47.4 |
| bad | 34.4 | 65.6 |
| very bad | 12.7 | 87.3 |

Which of the following statements are correct?

- (a) The percentage table gives the satisfaction distribution for each location type.
 - (b) The value in row 2 and column 2 in the percentage table indicates: 47.4 percentage of those, who evaluated the public transportation as good live in the suburbs.

- (c) The percentage table contains total percentages.
 - (d) The value in row 1 and column 1 in the percentage table indicates: 75.9 percent of those, who evaluated the public transportation as very good, live in the city centre.
 - (e) The percentage table can be easily constructed from the original contingency table: percentages are calculated for each row.
4. (2.5 points) A machine fills milk into 125ml packages. It is suspected that the machine is not working correctly and that the amount of milk filled differs from the setpoint $\mu_0 = 125$. A sample of 168 packages filled by the machine are collected. The sample mean \bar{y} is equal to 131.7 and the sample variance s_{n-1}^2 is equal to 58.91.
- Test the hypothesis that the amount filled corresponds on average to the setpoint. What is the value of the t test statistic?
- (a) 21.682
 - (b) 19.611
 - (c) -11.497
 - (d) -1.121
 - (e) 11.314

