Exam questions MEVIT 4800

*Read the following questions carefully, and answer them according to the instructions. You will not need to calculate anything, but you will have to explain some key theoretical concepts and (statistical) methods we have discussed throughout the course. Whereas most questions ask for short explanations and descriptions, questions 4, 5 and 6 require a longer answer.*

**Open questions**

1. You want to compare the average number of tacos consumed annually, by Norwegian and Swedish students.

a) Formulate a null hypothesis, a directional H1 and a non-directional H1.

b) We now want to test whether we can find a statistically significant difference between the average amount of tacos consumed annually by Norwegian and Swedish students, based on your <u>non-directional H1.</u>

Does that mean we need to use a <u>one-tailed</u> or a <u>two-tailed</u> statistical test? Explain your answer.

2. You want to explore whether a relationship exists between age and average weekly use of Tik Tok (in minutes). There is very little theoretical evidence on which you can base your research.

a) Formulate an appropriate research question.

b) You run a Pearson's correlation between age and average weekly use of Tik Tok (in minutes). Your results are:

r= -0.76, p=0.04

Explain what these results indicate. Make sure to mention <u>statistical significance, strength</u> and <u>directionality </u>of the relationship.

3. Define and explain the following concepts:

a) Ordinal variables (and give one example of an ordinal variable)

b) The mean

c) The standard deviation

d) Z-scores

e) Inferential statistics

f) Probability sampling

4. Imagine you are going to study student motivation to learn statistics among first year Bachelor students at UiO. You want to collect your data through distributing online surveys.

a) Define 'content validity'. Illustrate by using this particular example study.

b) Define 'reliability'. Illustrate by using this particular example study.

c) Explain two ways in which you can enhance the reliability of your survey data using this particular example study.


5. Explain why a qualitative research method might be more suitable for a research project compared to a quantitative method. In your explanation, critically reflect on the respective strengths and weaknesses of quantitative and qualitative methods.


6. Explain what a document is and what is the difference between analyzing a document as a source and as a text. Use examples.


7. Explain what you would need to take into consideration to design a good set of interview questions. Make sure you cover both the design of the questions and how these fit within the practical execution of the interview.


8. You want to explore whether students from different study programmes have different average starting salaries. Your independent variable is 'study programme', and has three categories: 1) medicine, 2) accounting and 3) media and communication. Your dependent variable is 'starting salary' measured in Norwegian kroner. Explain which of the following statistics tests is appropriate to use, by mentioning the level of measurement of both variables, and whether you are essentially exploring a relationship between variables, or differences between groups.

- An independent samples t-test
- Pearson's correlation
- Chi square
- ANOVA


9. You are creating a sample of respondents for a survey. Your population is students from all elementary schools in Norway. You randomly select a number of elementary schools from the total list of schools, after which you randomly select a number of students from each selected school.,

a) Explain what kind of sampling procedure this is.

b) Explain why this is either probability or non-probability sampling.


10. The central limit theorem is one of the main theoretical assumptions in inferential statistics. Define the central limit theorem, and briefly explain what it means. Make sure to refer to the difference between the distribution of a sample, and the distribution of sample means.

| Question | |
|---|---|
| 1 | a 6 (two per each correct hypothesis)<br>b 3 |
| 2 | a 2<br>b 6 (2 per each correct use of term) |
| 3 | a 3<br>b 3<br>c 3<br>d 3<br>e 3<br>f 3　　　　total: 18 |
| 4 | A 2 (one for correct definition, one for use of example)<br>B 2 (one for correct definition, one for use of example)<br>C 4 (two for each correct argument) |
| 5 | 15 |
| 6 | 15 |
| 7 | 15 |
| 8 | 4 |
| 9 | A 2<br>B 2 |
| 10 | 4 |
| Total | 100 |

A: 90-100 points

B: 80-90 points

C: 70-80 points

D: 60-70 points

E: 50-60 points

F: 50 points or lower.