

# **Quantitative methods**

**Final exam for group MBA6**

Name\_\_\_\_\_

Date\_\_\_\_\_

**Task 1. (4 points)**

There are six men and seven women in a ballroom dancing class. If four men and four women are chosen and paired off, how many pairings are possible?

**Task 2. (4 points)**

Suppose you pick two cards from a deck of 52 playing cards. What is the probability that they are both queens?

**Task 3. (4 points)**

Suppose you are taking a multiple-choice test with 5 choices for each question. In answering a question on this test, the probability that you know the answer is 0.6. If you don't know the answer, you choose one at random. What is the probability that you knew the answer to a question, given that you answered it correctly?

**Task 4. (4 points)**

Directly from the definitions of expected value and variance, compute  $E(X)$  and  $\text{Var}(X)$  when  $X$  has probability mass function given by the following table:

X	-2	-1	0	1	2
p(X)	1/15	2/15	3/15	4/15	5/15

**Task 5. (4 points)**

A Magazine wants to launch an online version, but only if more than 20% of its subscribers would subscribe to it. A random survey of 400 subscribers indicated that 90 would be interested. Test the hypothesis that online version be successful ( $\alpha=0.05$ )?

**Task 6. (20 points)**

Workfile: *exam\_mba6.wf1*

The file contains the following variables:

- *CS - PERSONAL CONSUMPTION EXPENDITURES (BIL. 1987\$)*
- *GDP - GROSS DOMESTIC PRODUCT (BIL. 1987\$)*
- *GOV\_NET - FED GOV'T RECEIPTS & EXPEND: SURPLUS OR DEFICIT*
- *INV - USE OF GROSS SAVINGS: GROSS INVESTMENT*
- *P\_GDP - GROSS DOMESTIC PRODUCT: IMPLICIT PRICE DEFLATOR (INDEX, 87=100)*

For all tests use level of confidence 95%. Critical values and final answers must be given.

1. Estimate a model  $cs_t = \beta_0 + \beta_1 gdp_t + \beta_2 cs_{t-1} + \varepsilon_t$
2. Test the model for significance.
3. Check coefficients for significance.
4. If the model is stable in 1973:1?
5. If there is a heteroscedasticity of residuals?
6. If there is an autocorrelation of residuals?
7. Forecast CS for all quarters of 1992 based on data with 1991:4 last observation. Calculate the forecasting error.
8. Explain how GDP influences the CS.
9. Propose other model, using all data provided. Is your model better than the first one?
10. Give economic explanation and policy recommendations based on the best model.

Task	Answer
1.	
2.	
3.	
4.	
5.	
6.	
7.	

8.	
9.	

10.	
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