SEMEN KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS
Educational level: first (bachelor)
Term 1
Educational discipline: Higher Mathematics in International Business

Examination paper (EXAMPLE)

Task 1 (6 points)
The depositor paid UAH 20,000 to the bank. The annual interest charged by the bank is 5%. Calculate the total profit the depositor will have if you save money in the bank for 5 years in the following cases: a) the depositor annually withdraws funds that are accrued by interest; b) the depositor does not withdraw money within 5 years, i.e. interest capitalization occurs.

Task 2 (8 points)
Find the solution of the system of linear algebraic equations by the Gauss method:
$$-4x_2 - x_3 = -9,$$
$$2x_1 - x_2 + 3x_3 = -1,$$
$$-3x_1 - x_2 + 4x_3 = 5.$$

Task 3 (8 points)
Investigate the function at the extremum.
$$y = \frac{x^2 - 3}{x^2 + 1}$$
Determine the largest and smallest value of this function on the interval $x \quad [-1; 2]$

Task 4 (8 points)
Three employees of the department fill out the reports and put them in a common folder. The probability of making a mistake for the first employee is 0.2, for the second – 0.1, for the third – 0.05. During the day, the first employee filled out 15 reports, the second – 20, the third – 15. At the end of the day, a document was taken from the folder at random. It turned out to contain an error. Determine the probability that this document was prepared by a second employee.

Task 5 (10 points)
20 students took part in training on writing business plans. During the check, it was found that the number of errors is, respectively: 4, 2, 1, 3, 5, 4, 1, 4, 1, 2, 4, 3, 4, 5, 1, 4, 1, 2, 4, 4. Construct a discrete variational series of the distribution of this random variable and its polygon. Calculate numerical characteristics of the sample: the sample mean; the standard deviation of the sample and sample coefficient of skewness. Draw a conclusion about the law of distribution of such errors in the general population.