

1. In a shop it has been sold 17 of 20 cameras of three types available in quantities of 6, 9 and 5 units. Assuming that probability to be sold for a camera of each type is the same, find the probability that there were unsold cameras of two types.

2. Find by the method of maximal plausibility on a sample  $x_1, x_2, \dots, x_n$  the pointwise estimator of parameter  $a$  of the following distribution (parameter  $\sigma$  is known) of which density is  $f(x) = \frac{1}{3\sqrt{\sigma}} e^{-[2g(x)-3a]^2 / \sigma^2}$ , where  $g(x)$  is a differentiable function.

3. A continuous random variable  $X$  is given by the integral function (function of distribution)  $F(x)$ . Find:

- a) the probability of hit of the random variable  $X$  into the interval  $(a, b)$ ;
- b) the differential function (function of probability density)  $f(x)$ ;
- c) mathematical expectation, dispersion and mean square deviation of the random variable  $X$ .

$$F(x) = \begin{cases} 0 & \text{if } x \leq \sqrt{2} \\ \frac{x^6 - x^4 - 4}{96} & \text{if } \sqrt{2} < x \leq \sqrt{5}; \quad a = 1,5; b = 2. \\ 1 & \text{if } x > \sqrt{5} \end{cases}$$

4. There are 300 white and 200 black balls in an urn. 100 balls have been taken out (with returning). Give a lower bound for the probability that the amount of white balls from the taken out balls satisfies to the double inequality:  $40 < m < 80$ .

5. At inspecting 60 fish packs of a given batch the following data on weight of a separate pack (in grams) have been obtained:

248	239	263	242	279	246	265	242	263	255
273	249	209	252	266	278	247	248	202	252
259	235	249	264	246	275	274	296	232	217
292	294	223	265	267	258	213	277	275	266
248	286	268	288	232	262	244	246	252	259
258	254	231	251	229	258	267	249	253	249

- a) Compose the interval variation series taking the beginning of the first interval equal 200, and the width of each interval equal 10.
- b) Find the cumulative and relative frequencies.
- c) Find the mode and the median.

Lecturer

Mukash N.K.

Head of School of Applied Mathematics

Issakhov A.A.