

## Practice 6

6.1. There are 6 motors in a shop. For each motor the probability that it is turned (switched) on at present time is equal to 0,8. Find the probability that at present:

a) 4 motors are turned on;

b) all motors are turned on;

c) all motors are turned off (a shop – цех). The answer: a) 0,246; b) 0,26; c) 0,000064.

6.2. Find the probability that an event A will appear in five independent trials no less than two times if the probability of occurrence of the event A for each trial is equal to 0,3.

The answer: 0,472.

6.3. A coin is tossed 6 times. Find the probability that the coin lands on heads: a) less than two times;

b) no less than two times.

The answer: a)  $7/64$ ; b)  $57/64$ .

6.4. Find approximately the probability that an event will happen exactly 104 times at 400 trials if in each trial the probability of its occurrence is equal to 0,2.

The answer: 0,0006.

6.5. The probability of striking a target by a shooter at one shot is equal to 0,75. Find the probability that at 100 shots the target will be struck:

a) no less than 70 and no more 80 times; b) no more than 70 times.

The answer: a) 0,7498; b) 0,1251.

6.6. The probability that an event A will appear at least once at two independent trials is equal to 0,75. Find the probability of appearance of the event in one trial (it is supposed that the probability of appearance of the event in both trials is the same).

The answer: 0,5.

6.7. A coming up a potato is equal to 80 %. How many is it necessary to plant potatoes that the most probable number of came up potatoes of them was equal to 100 (to come up – всходить (о растении))?

The answer: 124 or 125.

6.8. There are 4000 bees in a bee family. The probability of illness within a day is equal to 0,002 for each bee. Find the probability that more than one bee will be ill within a day (a bee – пчела).

The answer: 0,99.

6.9. A coming up a grain stored in a warehouse is equal to 80%. What is the probability that the number of came up grains among 100 ones will make from 68 up to 90 pieces (a grain – зерно)?

The answer: 0,992.

6.10. The probability of receiving an excellent mark at an exam is equal to 0,2. Find the most probable number of excellent marks and the probability of this number if 50 students pass the exam.

The answer:  $k_0 = 10$  and  $P_n(k_0) = 0,141$ .

6.11. 7 out of 100 batteries fail during a year of storage. 5 batteries are chosen at random. Determine the probability that there are 3 serviceable ones among them.

6.12. The device, consisting of five independently operating elements, is switched on in time T. The probability of fail of each of them during this time is 0.2. Find the probability that they will fail:

a) three elements;

b) at least four elements;

c) at least one element.

6.13. The probability of born a boy is 0.51. Find the probability that among 100 newborns there will be 50 boys.

6.14. The conveyor receives 300 products per shift. The probability that the part delivered to the conveyor is standard is 0.75. Find the probability that the standard parts on the conveyor for the shift received exactly 240.

6.15. The probability of making a good part is 0.8. Produced 500 parts. What number of suitable parts is more probably to get: a) less than 390; b) from 390 to 410?

6.16. Find the probability that if you roll a coin 200 times, heads will fall from 90 to 110 times.