Student: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Group: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lecturer: A.S. Eremenko

**Homework 6**

1. What is a random variable:

1

a) a possible outcome;

b) the numerical value;

c) the experimental value;

d) a real-valued function of the experimental outcome?

 2. A random variable is called discrete if:

1

a) it can be conditioned on another random variable;

b) its range is finite or at most countably infinite;

c) the set of values that it can take is uncountably infinite;

d) it can be independent from an event of from another random variable.

 3. A discrete random variable has an associated:

1

a) PMF;

b) PDF;

c) function of random variable;

d) real-valued function.

 4. If is any possible value of , the probability of the event , consisting of all outcomes that give rise to a value of equal to , is:

1

a) the probability density;

b) the probability mass of ;

c) ;

d) the variance of .

 5. Which from the listed below properties are true for a probability density functions:

a) for any subset of the real line ;

1

b) ;

c) ;

d) ?

 6. What can be interpreted as the area under the graph of the PDF:

a) ;

1

b) the probability that the value of falls within an interval;

c) ;

d) entire area under the graph of the PDF must be equal to 1?

 7. What provides cumulative distribution function :

1

a) the probability ;

b) the probability ;

c) probability mass per unit length;

d) area under the graph of the PDF.

 8. Indicate -axis on graphs and corresponded RV (continuous or discrete):



3



**Problem 1**. Show graphically PMF and corresponding CDF of discrete random variable of number of failures of the router during the day, if:

, , , , .

5

*Solution*:

**Problem 2.** No failure operating time of some device has an exponential PDF:

, , where – time in .

Find the probability that device will operate without failures during .

*Solution*:

5

20