

MAT 2377 Mi-term II

Wednesday November 9 2016	Professor Mayer Alvo
Time: 70 minutes	
Student Number:	_
Name:	

This is an open book test. Standard calculators are permitted. Answer all questions. Place your answers in the table below and remit the entire exam.

Question	1	2	3	4	5	6	7	8	9	10
Answer	C	C	A	В	A	D	A or E	E	C	В

- If the probability that a fluorescent light has a useful life of at least 800 hours is 0.7, find the probability that among 15 such lights, at least 10 will have a useful life of at least 800 hours.
 (A) 0.2784 (B) 0.4845 (C)* 0.7216 (D) 0.5155 (E) 0.7000
- 2. A box contains 10 iphones of which 3 are defective. What is the probability that in a sample of 3 phones chosen without replacement from this box, at most one will be defective?
 - (A) 0.2917 (B) 0.3792 (C)* 0.8167 (D) 0.6208 (E) 0.4667
- 3. Printing errors occur on an average of one in 500 characters. What is the probability that there will be at least 11 and at most 15 errors among 8000 characters?
 (A)* 0.3893 (B) 0.4667 (C) 0.0774 (D) 0.3397 (E) 0.8730
- 4. A die with probability 0.10 of getting a "6" is tossed repeatedly until we get the first "6". How many tosses will there be on average?
 (A) 0 (B)* 10 (C) 100 (D) 6 (E) 9
- 5. Five numbers are picked at random and independently on the interval (0,1). What is the probability that at most 2 of them are less than 0.3? (A)* 0.8369 (B) 0.3000 (C) $\frac{2}{5}$ (D) 0.1631 (E) 0.5282
- 6. In a manufacturing process, the probability of producing a defective bolt is 0.01. What is the probability that at least 8 defective bolts will be produced in a batch of 500?
 (A) 0.93 (B) 0.87 (C) 0.01 (D)* 0.13 (E) 0.96
- 7. Suppose that a random sample of 36 is chosen from a distribution with density

$$f_X(x) = 2(1-x), 0 < x < 1$$

= 0, otherwise.

Calculate approximately to two decimals, the probability $P\left(10 \leq \sum_{i=1}^{36} X_i \leq 14\right)$.

(A)* 0.84 (B) 0.68 (C) 0.08 (D) 0.92 (E)* 0.84

8. Measurements of the heat-producing capacity of the coal produced by two coal mines (in millions of calories per ton) is given in the table below. Calculate $P(\bar{X} > \bar{Y} + 141)$ when the population means are the same.

Coal mine	sample means	population variances	sample size
Х	8230	15750	5
Y	7940	10920	6

les mesures de la capacité produisant de la chaleur du charbon produit par deux mines de charbon (en millions de calories par tonne) sont données dans le tableau ci-dessus. Calculer $P(\bar{X} > \bar{Y} + 141)$ si les moyennes des deux populations sont les mêmes. . (A) 1.00 (B) 0.5000 (C) 0.9772 (D) 0 (E)* 0.0228

9. The lifetime of a light bulb follows and exponential distribution with mean 1000 hours. What is the probability that such a light bulb will last at most 1500 hours given that it has lasted 1200 hours?
(A) 0.000 (B) 0.800 (C)* 0.259 (D)0.200 (E) 0.741

10. What is the probability that an exponential random variable falls between two standard deviations of its mean?

(A) 0.0498	(B)*0.9502	(C)0.095	(D) 0.498	(E)0.905
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