Department of Statistics & Operations Research
College of Science
King Saud University
STAT-324: Probability and Statistics for Engineers
Second Mid-Term Exam
Second Semester 1435 – 1436

Student's Name (In Arabic):		Section's Number:	
Student's Number:		Attendance number:	
Teacher's Name:			

Instructions:

- There are 25 multiple choice questions.
- Time allowed is 90 minutes (1.5 Hour).
- For each question, put the code of the correct answer in the following table beneath the question number.
- Please, use capital letters: A, B, C, and D.
- Do not copy answers from your neighbors; they have different question forms.
- Mobile Telephones are not allowed in the classroom.

1	2	3	4	5	6	7	8	9	10

11	12	13	14	15	16	17	18	19	20

21	22	23	24	25

Question (1-6):

Given the standard normal distribution, Z~N(0,1), find:

(1) The area under the curve between z=-1.55 and z=1.55

(A) 0.8788	(B) 0.998	(C) 1.5396	(D) 0.0864

(2) P(Z ≥2.05) =

(A) 0.1088	(B) 0.0202	(C) 0.3645	(D) 0.1875

(3) P(0.1< Z <2.05) =

(A) 0.0746	(B) 0.9950	(C) 0.4400	(D) 0.9750

(4) If P(Z < a) = 0.879, then the value of a =

(A) 2.54	(B)-1.87	(C) 1.64	(D) 1.17

(5) If P(-k < Z < k) = 0.95, then the value of k =

(A) 2.54	(B) 2.31	(C)1.96	(D) 0.5

(6) P(Z=1.89) =

(A) 0.1220	(B) 0.1660	(C) 0.1550	(D) 0.0

Question (7-9):

The weight of a large number of fat persons is nicely modeled with a normal distribution with mean of 100 kg and a standard deviation of 10 kg, find the probability that an individual picked at random from this population will have a weight

(7) at most 100 kg is:

(A) 0.75	(B) 0.125	(C) 0.0162	(D) 0.5

(8) Greater than 105 kg:

(A) 0.3085	(B) 0.4388	(C) 0. 0.0062	(D) 0.5278

(9) Between 75 and 125 kg:

(A) 0.9876	(B) 0.7135	(C) 0.6153	(D) 0.8995

Question (10-11):

Suppose that the life time of a system is a random variable T which is modeled nicely by an exponential distribution with mean of 6 years.

(10) The variance of T is:

(A) 136	(B) 36	(C) 0.514 2	(D) 0.6161

(11) The probability that the life time of the system is greater than 10 years is

(A) 0.0462	(B) 0.1889	(C) 0.4143	(D) 0.2960

Question (12-13):

Let X be a normal random variable with mean 4 and variance 9. Then

(12) $P(X \geq 10.15)$ =

(A) 0.56	(B)0.0202	(C) 0.514 2	(D) 0.6161

(13) If $P(X < a) = 0.879$, then the value of a =

(A) 8	(B)7.51	(C)8.9	(D) 6.89

Question (14-17):

It is known that 60% of mice inoculated with aserum are protected from a certain disease (does not contract the disease). If 5 mice are inoculated, the probability that

(14) none contracts the disease:

(A) 0.264	(B) 0.331	(C) 0.078	(D) 0.159

(15) fewer than 2 contract the disease:

(A) 1.005	(B) 0.337	(C) 0.932	(D) 0.085

(16) more than 2 contract the disease:

(A) 0.2842	(B) 0.7315	(C) 0.4941	(D) 0.3174

(17) the standard deviation of the number of mice that contract the disease:

(A) 1.095	(B) 0.951	(C) 1.594	(D) 0.858

Question (18-20):

A company is interested in evaluating its current inspection procedure for shipments of 10 identical items. The procedure is to take a sample of 5, without replacement. The defective proportion of shipments is 20%. The probability that in the sample

(18) none found to be defective:

(A)0.222	(B) 0.526	(C) 0.123	(D) 0.628

(19) no more than 1 found to be defective:

(A) 0.361	(B) 0.518	(C) 0.471	(D) 0.778

(20) the mean number found to be defective:

(A) 2	(B) 0.5	(C) 1	(D) 7

Question (21-23):

On average, a textbook author makes two word-processing errors per page on the first draft of his textbook. Assuming that the number of errors follows Poisson distribution, the probability that:

(21) on the next page he will make no errors:

(A) 0.076	(B) 0.305	(C)0.135	(D) 0.215

(22) on the next page he will make 2 or more errors:

(A) 0.723	(B) 0.594	(C) 0.151	(D) 0.807

(23) The probability that on the next two pages he will make 1 or more errors:

(A) 0.982	(B) 0.678	(C) 0.265	(D) 0.781

Question (24-25):

Suppose that X has the following uniform distribution:

$$f(x) = \begin{cases} \frac{1}{3}, & x = 1, 3, 4 \\ 0, & otherwise \end{cases}$$

(24) $P(X \geq 2) =$

(A) 0.282	(B) 0.667	(C) 0.155	(D) 0.437

(25) The mean of X is:

(A) 3.275	(B) 1.888	(C) 5.234	(D) 2.667