



Department of Statistics
& Operations Research
College of Science, King Saud University



STAT 324

Second midterm Examination

Second Semester

1430 – 1431 H

Student Name			
Student No.		Group No.	
Attendance No		Teacher's Name	

- Mobile Telephones are not allowed in the classrooms.
- Time allowed is **90 minutes**.
- Answer all questions.
- Choose the nearest number to your answer.
- **WARNING:** Do not copy answers from your neighbors. They have different question forms.
- For each question, put the code of the correct answer in the following table beneath the question number.

1	2	3	4	5	6	7	8	9	10
A	A	D	B	C	D	A	C	C	D

11	12	13	14	15	16	17	18	19	20
B	D	A	D	C	A	B	A	D	B

21	22	23	24	25
C	A	B	C	B

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① In testing a certain kind of truck tire over a rugged terrain, it was found that 75% of the trucks completed the test without a blowout. If five trucks are selected at random, then:

- 1) The probability that no truck will complete the test without a blowout is :
(A) **0.0010** (B) 0.9990 (C) 0.2373 (D) 0.7627
 - 2) The probability that at least four of them will complete the test without a blowout is:
(A) **0.6328** (B) 0.3627 (C) 0.3955 (D) 0.2763
 - 3) The expected number of trucks that will complete the test without a blowout is equals to :
(A) 1.00 (B) 0.00 (C) 3.00 (D) **3.75**
-

② Suppose that on average 0.6 persons out of 1000 make a numerical error in preparing his or her income tax return. Assuming that the number of persons making numerical errors follows Poisson distribution, then:

- 4) The probability that at most one person out of 1000 will make a numerical error is:
(A) 0.8601 (B) **0.8781** (C) 0.9769 (D) 0.2351
- 5) The probability that two persons out of 500 make a numerical error is:
(A) 0.0988 (B) 0.0451 (C) **0.0333** (D) 0.5000

③ From a lot of 20 missiles, five missiles will not fire. If 10 are selected at random, then:

- 6) The probability that two missiles will not fire is:
(A) 0.2140 (B) 0.9314 (C) 0.6517 (D) **0.3483**
 - 7) The probability that at most one missile will not fire is:
(A) **0.1571** (B) 0.2614 (C) 0.8483 (D) 0.9998
 - 8) The expected number of missiles that will not fire is:
(A) 1.00 (B) 2.00 (C) **2.50** (D) 3.50
-

④ The lifetime of an HP laserprinter model (in months) is assumed to have an exponential distribution with mean lifetime equal to 70 months, then

- 9) The probability that a randomly selected HP laserprinter model will last more than 150 months is:
(A) 0.8827 (B) 0.2788 (C) **0.1173** (D) 0.7212

- 10) The probability that a randomly selected HP laserprinter model will last exactly 150 months is:
(A) 0.8827 (B) 0.2788 (C) 0.1173 (D) **0.0000**
- 11) The variance lifetime of HP laserprinters model in months is:
(A) 1/70 (B) **4900** (C) 140 (D) 35
-

5 A controlled satellite is known to have an error (distance from target) that is normally distributed with average error distance equals to 40 cm and a standard deviation equals to 4 cm, then:

- 12) The probability that the error distance from the target is greater than 42 cm is:
(A) 0.1269 (B) 0.2167 (C) 0.4257 (D) **0.3085**
- 13) The probability that the error distance from the target is greater than 42 cm and less than 44 cm is
(A) **0.1498** (B) 0.2599 (C) 0.3599 (D) 0.4599
- 14) If the probability that the error distance from the target is greater than the distance C is equal to 0.9732, then the distance C is equal to:
(A) 4.50 cm (B) 10.20 cm (C) 20.50 cm (D) **32.28 cm**
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6 A certain machine makes electrical resistors that have an average resistance of 100 ohms and a standard deviation of 36 ohms. If a random sample of size, 36 resistors are drawn from the product of this machine, then:

- 15) The probability that the average resistance of the 36 resistors will be less than 91 ohms is:
(A) 0.1549 (B) 0.0753 (C) **0.0668** (D) 0.0875
- 16) The probability that the average resistance of the 36 resistors will be between 95 and 105 ohms is:
(A) **0.5934** (B) 0.6174 (C) 0.8432 (D) 0.7647
-

7 A random sample of 10 automobile owners shows that in a small village an automobile is driven on average 7.575 km in one hour with a standard deviation of 1.724 km. If μ is the average distance automobiles is driven in the village in one hour, assuming that the population follows a normal distribution, then:

- 17) The point estimate for μ is
(A) 1.233 (B) **7.575** (C) 0.9772 (D) 0.5793
- 18) The maximum error of estimating μ with a 95% confidence is:
(A) **1.233** (B) 12.33 (C) 0.9772 (D) 0.5793
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19) The lower bound of the 95% confidence interval for estimating μ is

- (A) 0.5793 (B) 12.33 (C) 0.9772 (D) **6.342**
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8) Students may choose between a 3-semester hour course on physics without labs and a 4-semester hour course with labs. The final examination is the same for each section. If 10 students in the section with labs made an average grade of 70 with standard deviation 5, and 8 students in the section without labs made an average grade of 65 with standard deviation 3. Assuming that two populations to be normally distributed with equal variances, then:

20) The point estimate of the difference between the true grade means ($\mu_1 - \mu_2$) is:

- (A) 4 (B) **5** (C) 6 (D) 7

21) The maximum value of the error of estimating a 95% confidence interval of the difference between the true grade means ($\mu_1 - \mu_2$) is:

- (A) 1.2584 (B) 2.2536 (C) **4.2664** (D) -4.1258

22) The lower bound of the 95% confidence interval for the difference between the true grade means ($\mu_1 - \mu_2$) is equal to:

- (A) **0.7334** (B) 7.65 (C) 2.35 (D) 7.02

23) the upper bound of the 95% confidence interval for the difference between the true grade means ($\mu_1 - \mu_2$) is equal to:

- (A) 2.99 (B) **9.2665** (C) 2.35 (D) 7.02
-

9) A random sample of 1000 voters is selected and 250 are found to be in favor of the Republicans, then:

24) The point estimate for the true proportion of the voters who are in favor of the Republicans is:

- (A) 0.96 (B) 0.75 (C) **0.25** (D) 0.42

25) The lower bound of the 95% confidence interval for the true proportion of the voters who are in favor of the Republicans is:

- (A) 0.217 (B) **0.223** (C) 0.285 (D) 0.567

Good Luck....