

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS  
DEPARTMENT OF MATHEMATICS

CODE 001

STAT 211 BUSINESS STATISTICS I  
Semester 231, Major Exam 2  
Thursday November 9, 2023

CODE 001

Time allowed 100 minutes.

Name: \_\_\_\_\_ ID #: \_\_\_\_\_

Section #: \_\_\_\_\_ Serial #: \_\_\_\_\_

**Important Notes:**

- You are not allowed to bring formula sheet or any other printed/written paper.
- Make sure you have 11 pages of exam paper (including this title page) and 20 questions.
- Students are not allowed to enter the exam hall without either KFUPM ID or Saudi ID/Iqama ID.
- Students must take the exam in the place assigned to them.
- Students are not allowed to carry mobiles, smart watches, or electronic devices to the exam halls/rooms.
- Violations of these rules will result in a penalty decided by the chairman of Math Department.

A Gallup poll reports that the percentage of U.S. workers engaged with their workplace is more than twice as high as the percentage of German workers. The results of the poll are summarized in the following table:

ENGAGEMENT	COUNTRY		Total
	United States	Germany	
Engaged	550	246	796
Not engaged	<u>1,345</u>	<u>1,649</u>	<u>2,994</u>
Total	1,895	1,895	3,790

Source: Data extracted from M. Nink, "Employee Disengagement Plagues Germany," *Gallup Management Journal*, [gmj.gallup.com](http://gmj.gallup.com), April 9, 2009.

Based on the above results answer the following 3 questions:

1. If an employee is selected at random, what is the probability that he or she is engaged with his or her workplace *or* is a U.S. worker?
  - A. 0.8549
  - B. 0.4351
  - C. 0.1451
  - D. 0.5649
  - E. 0.2987
  
2. If an employee is selected at random, what is the probability that he or she is not engaged with his or her workplace and is not a U. S. worker?
  - A. 0.5649
  - B. 0.3549
  - C. 0.1451
  - D. 0.8549
  - E. 0.4351

3. Given that a worker is from Germany, what is the probability that the worker is not engaged?
- A. 0.1298
  - B. 0.2902
  - C. 0.7098
  - D. 0.8702
  - E. 0.5649
4. A sample of 500 respondents in a large metropolitan area was selected to study consumer behavior. Among the questions asked was “Do you enjoy shopping for clothing?” Of 240 males, 136 answered yes. Of 260 females, 224 answered yes. If the person selected enjoys shopping, what is the probability that person is a male?
- A. 0.272
  - B. 0.378
  - C. 0.257
  - D. 0.289
  - E. 0.743

5. A survey of 1,895 workers in Germany found that 13% of the workers were engaged, 67% were not engaged, and 20% were actively disengaged. The survey also noted that 48% of engaged workers strongly agreed with the statement "My current job brings out my most creative ideas." Only 20% of the not engaged workers and 3% of the actively disengaged workers agreed with this statement. If a worker is randomly selected, what is the probability that he/she is strongly agree with the statement "My current job brings out my most creative ideas,".

- A. 0.2024
- B. 0.3083
- C. 0.6621
- D. 0.3379
- E. 0.0296

6. If  $P(B) = 0.3$ ,  $P(A|B) = 0.6$  and  $P(A|\bar{B}) = 0.5$ , then  $P(B|A) =$

- A. 0.51
- B. 0.18
- C. 0.53
- D. 0.34
- E. 0.82

The following table contains the probability distribution for the number of traffic accidents daily in a small city:

Number of Accidents Daily ( $X$ )	$P(X = x_i)$
0	0.10
1	0.20
2	0.45
3	0.15
4	0.05
5	0.05

Based on the above information, answer the following two questions:

7. Compute the mean number of accidents per day.

- A. 2
- B. 4
- C. 0.20
- D. 3
- E. 0.17

8. Compute the standard deviation.

- A. 1.02
- B. 1.40
- C. 0.20
- D. 1.18
- E. 0.17

When a customer places an order with Rudy's On-Line Office Supplies, a computerized accounting information system (AIS) automatically checks to see if the customer has exceeded his or her credit limit. Past records indicate that the probability of customers exceeding their credit limit is 0.05. Suppose that, on a given day, 20 customers place orders. Assume that the number of customers that the AIS detects as having exceeded their credit limit are independent from each other.

Based on the above information answer the following two questions:

9. What are the mean and standard deviation of the number of customers **not exceeding** their credit limits, respectively, are?

- A. 1 and 0.9747
- B. 19 and 0.95
- C. 20 and 0.95
- D. 20 and 0.9747
- E. 19 and 0.9747

10. What is the probability that two or more customers will exceed their limits?

- A. 0.9747
- B. 0.2642
- C. 0.3774
- D. 0.7358
- E. 0.0253

11. A toll-free phone number is available from 9 A.M. to 9 P.M. for your customers to register complaints about a product purchased from your company. Past history indicates that an average of 0.8 calls is received per minute. What is the probability that in a one-minute period three or more phone calls will be received?

- A. 0.0383
- B. 0.9909
- C. 0.0474
- D. 0.0091
- E. 0.9526

12. Given a standardized normal distribution (with a mean of 0 and a standard deviation of 1). What is the probability that  $Z$  is less than -1.57 or greater than 1.84?

- A. 0.9671
- B. 0.0911
- C. 0.0582
- D. 0.9089
- E. 0.0329

The dean of a business school wishes to form an executive committee of 5 from among the 40 tenured faculty members at the school. The selection is to be random, and at the school there are 8 tenured faculty members in accounting.

Based on the above information answer the following two questions:

13. What is the probability that the committee will contain not more than 1 tenured faculty member in accounting?

- A. 0.3060
- B. 0.4372
- C. 0.7432
- D. 0.6940
- E. 0.5628

14. What is the mean for the tenured non accounting faculty members?

- A. 4
- B. 2.40
- C. 5.74
- D. 1
- E. 2.53



15. Given a standardized normal distribution (with a mean of 0 and a standard deviation of 1). What is the value of  $Z$  if only 2.5% of all possible  $Z$  values are larger?
- A. 1.65
  - B.  $-1.96$
  - C. 1.96
  - D.  $-1.65$
  - E. 2.57
16. Consumers spend an average of \$21 per week in cash without being aware of where it goes. Assume that the amount of cash spent without being aware of where it goes is normally distributed and that the standard deviation is \$5. What is the probability that a randomly selected person will spend maximum \$20?
- A. 0.5793
  - B. 0.0139
  - C. 0.9861
  - D. 0.4068
  - E. 0.4207

17. A statistical analysis of 1,000 long-distance telephone calls made from the headquarters of the Bricks and Clicks Computer Corporation indicates that the length of these calls is normally distributed, with mean 240 seconds and standard deviation 40 seconds. 2.5% of all calls will last less than how many seconds?
- A. 161.6 seconds
  - B. 318.4 seconds
  - C. 2.33 seconds
  - D. 240 seconds
  - E. 97.5 seconds
18. A study of the time spent shopping in a supermarket for a market basket of 20 specific items showed an approximately uniform distribution between 20 minutes and 40 minutes. What is the probability that the shopping time will be between 25 and 30 minutes?
- A. 0.30
  - B. 0.25
  - C. 0.15
  - D. 0.35
  - E. 0.40

19. Autos arrive at a toll plaza located at the entrance to a bridge at a rate of 50 per minute during the 5:00-to-6:00 P.M. hour. If an auto has just arrived, what is the probability that the next auto will arrive within 3 seconds?

- A. 0.6329
- B. 0.5661
- C. 0.9179
- D. 0.9502
- E. 0.4671

20. The time between unplanned shutdowns of a power plant has an exponential distribution with a mean of 20 days. Find the probability that the time between two unplanned shutdowns is more than 21 days.

- A. 0.6501
- B. 0.5034
- C. 0.2953
- D. 0.7047
- E. 0.3499