King Fahd University of Petroleum & Minerals
Department of Math and Stat
Math 131 Semester 172 * Final Exam

Name_____ ID No._____ Sec. No. _____

1) Suppose six people apply for two identical managerial positions at a company — two men and four women. Because the candidates are all considered equally qualified for the position, the company decides to randomly select the two candidates who will get the positions. How many different ways can two people be selected from the six applicants? 1) _____

A) 360 ways B) 30 ways C) 720 ways D) 15 ways E) 8 ways

2) The table displays the probabilities for each of the six outcomes when rolling a particular unfair die. Suppose that the die is rolled once. 2) _____

Outcome	1	2	3	4	5	6
Probability	.1	.1	.1	.2	.2	.3

Events X, Y, Z, and W are defined as follows.

X: {The number is even}
Y: {The number is less than 4}
Z: {The number is less than or equal to 5}
W: {The number is greater than or equal to 5}

Identify one pair of independent events.

A) Y and W B) Y and Z C) X and Y D) X and W E) Z and W

3) The probability that house sales will increase in the next 6 months is estimated to be 0.25. The probability that the interest rates on housing loans will go up in the same period is estimated to be 0.74. The probability that house sales or interest rates will go up during the next 6 months is estimated to be 0.89. What is the probability that house sales will increase but interest rates will not during the next 6 months? 3) _____

A) 0.15 B) 0.51 C) 0.89 D) 0.065 E) 0.10

4) An urn contains 3 green, 2 yellow, and 6 red marbles. If two marbles are randomly drawn without replacement, find the probability the second one is yellow, given that the first marble drawn is red. 4) _____

A) $\frac{2}{7}$ B) $\frac{2}{11}$ C) $\frac{1}{5}$ D) $\frac{1}{10}$ E) $\frac{4}{5}$

5) A lab orders a shipment of 100 frogs each week. Prices for the weekly shipments of frogs follow the distribution below: 5) _____

Price	$10.00	$12.50	$15.00
Probability	0.25	0.4	0.35

How much should the lab budget for next year's frog orders be assuming this distribution does not change? (Assume 52 weeks per year.)

A) $ 1950 B) $ 663 C) $ 575 D) $ 1275 E) $ 3447600

6) We know that 95% of the population of all Business students consider statistics to be an exciting subject. Suppose we randomly and independently selected 30 students from the population. Find the probability of observing 29 or more students who consider statistics to be an exciting subject. Round to six decimal places. 6) _____

A) 0.446458 B) 0.553542 C) 0.214639 D) 0.338903 E) 0.656321

7) The probability that an individual is left–handed is 0.12. In a class of 10 students, the mean and standard deviation of the number of left–handed students rounded to the nearest hundredth are respectively, 7) _____

A) 10 , 1.03 B) 1.2 , 1.1 C) 1.2 , 1.03 D) 10 , 1.1 E) 1.1 , 1.03

8) We know that the length of time it takes a student to find a parking spot in a certain parking lot follows a normal distribution with a mean of 3.5 minutes and a standard deviation of 1 minute. Find the probability that a randomly selected student will take between 2 and 4.5 minutes to find a parking spot in that parking lot. 8) _____

A) 0.7745 B) 0.0919 C) 0.4938 D) 0.2255 E) 0.8062

9) The amount spent on textbooks in a semester was recorded for a sample of six students $400, $350, $600, $525, $420, and $450 . The sample median for the data is 9) _____

A) $400 B) $465 C) $450 D) $600 E) $435

10) Given the sample: 4, 3, 8, 9, 7, 10 10) _____
The sample standard deviation is

A) 2.787 B) 2.145 C) 3.012 D) 2.993 E) 1.734

11) For some value of $Z > 1$, the probability that a standard normal variable is between 1 and Z is 0.0357. What is the value of Z? 11) _____

A) 1.47 B) 0.81 C) 0.18 D) 1.30 E) 1.16

12) Suppose consumers purchase q units of a manufacturer's product when the price per unit (in dollars) is $60 - 0.5q$. If no more than 75 units can be sold, then the number of units that must be sold in order that sales revenue be $1000 is 12) _____

A) 40. B) 50. C) 20. D) 25. E) 75.

13) A company will manufacture a total of 5000 units of its product at plants A and B. At plan A the unit cost for labor and material combined is $2.50, while at plant B it is $3.00. The fixed costs at plant A are $6000 and at plant B they are $8000. Between the two plants the company has decided to allot no more than $28,000 for total costs. The minimum number of units that must be produced at plant A is 13) _____

A) 2000. B) 2546. C) 1871. D) 2545. E) 2500.

14) The supply and demand equations for a product are $p = \frac{3}{100}q + 6$ and $p = -\frac{1}{50}q + 14$, respectively, 14) _____

where q represents number of units and p represents price per unit in dollars. If a tax of $1.00 per unit is imposed on the manufacturer, determine the new equilibrium price.

A) $11.4 B) $11.8 C) $10.8 D) $11.2 E) $10.4

15) A debt of $12,000, which is due 10 years from now, is instead to be paid off by four payments: $3000 now, $2000 in 3 years, $2000 in 6 years, and a final payment at the end of 8 years. What would this payment be if an interest rate of 5.5% compounded semiannually is assumed? 15) _____

A) $ 5000.0 B) $ 8112.7 C) $ 3273.1 D) $ 3237.0 E) $1282.9

16) Determine the effective rate equivalent to an annual rate of 7 % compounded continuously. 16) _____

A) 8.33 % B) 7.25 % C) 7.00 % D) 6.33 % E) 5.11 %

17) After graduating and gaining employment, you open an account to help save for retirement. If the account earns 6.15% compounded monthly and you deposit $250 into this account at the end of each month, what will the amount be when you retire 43 years later? 17) _____

A) $ 11,993 B) $ 48,856 C) $ 19,6335 D) $ 129,000 E) $ 633,252

18) A company has two different locations to assemble three different models of PCs. The table below summarizes the daily production capacity, the minimum number of each type needed, and the daily operating costs for each location. Find the number of days that location 2 needs to operate in order to fill the orders at minimum cost. 18) _____

	Location 1	Location 2	Minimum Number
Model 1	60/day	60/day	2400
Model 2	40/day	80/day	2000
Model 3	60/day	40/day	1800
Daily Cost	$16,000	$12,000	

A) 15 B) 10 C) 20 D) 30 E) 25

19) Using the simplex method to maximize 19) _____

$$Z = x_1 + 4x_2 + x_3$$

subject to

$$x_1 + x_2 + x_3 \le 6$$
$$x_1 - x_2 - 2x_3 \le 2$$
$$x_1, x_2, x_3 \ge 0 ,$$

the maximum value of Z is

A) 2 B) 24 C) 20 D) 16 E) 9

20) If the odds in favor of an event E are 2:7, find $P(E')$. 20) _____

A) $\frac{2}{9}$ B) $\frac{5}{7}$ C) $\frac{7}{9}$ D) $\frac{2}{7}$ E) $\frac{3}{5}$