American University of Beirut Math 204 Quiz II – (Fall 2017)

Time 70 minutes.

Name:	ID#:		
Circle your problem solving s	ection number below:		
• Instructor: <u>Ms Joumana</u>	<u> Fannous</u>		
Section 1 @ 1:00 M	Section 2 @ 11:00 M	Section 3 @ 4:00 M	
Instructor: <u>Mrs Maha Itani-Hatab</u>			
Section 4 @ 11:00 Tu	Section 5 @ 8:00 Tu	Section 6 @ 12:30 Tu	
• Instructor: <u>Ms. Michella Bou Eid</u>			
Section 7 @ 3:30 Th	Section 8 @ 2:00 Th	Section 9 @ 5:00 Th	
• Instructor: <u>Ms Najwa Ful</u>	leihan		

Section 10 @ 8:00 Tu Section 11 @ 2:00 Tu Section 12 @ 11:00 Tu

Question	Grade
1	/ 16
2	/ 4
3	/ 11
4	/ 15
5	/ 18
6	/ 11
7,8	/12
9	/ 13
Total	/ 100

- 1. Every day I go to the university by car or by bus. The probability that I go by car is 0.25. If I go by car, the probability that I will be in class on time is 0.2, whereas if go by bus the probability that I will not be in class on time is 0.6
 - **a.** Plot a tree diagram to illustrate the given.

(3 pts)

b. Find the probability that I will be in class on time

(3 pts)

c. If I will be in class on time, what is the probability that I go by car?

(3 pts)

d. Find the probability that I go by car or I will be in class on time

(4 pts)

e. Are the events "I go by bus" and "I will be in class on time " mutually exclusive?(3 pts)

2. If z is a standard normal variable, find $P(-2.03 < z \le 1.74)$

(4 pts)

- **3.** Let *X* be a continuous random variable that follows a normal distribution with a mean of 200 and a standard deviation of 20.
 - **a.** What data value from the distribution corresponds to z = -1.27

(2 pts)

b. Find P(X < 225)

(4 pts)

c. Find the value of *X* so that the area under the normal curve to the left of *X* is 0.0934.

(5 pts)

4. The probability that a student is accepted to a prestigious college is 0.3. If 5 students from the

- same school apply, what is the probability that:
 - **a.** exactly 3 students are accepted?

(2 pts)

b. more than 4 are not accepted?

(3 pts)

c. no more than 2 students are accepted?

(3 pts)

d. at most 3 students are accepted given that at least one student is accepted?

(5 pts)

e. what is the expected number of students that are not accepted among 20 students?

(2 pts)

	5. In a box containing 50 pens and markers, there are 18 pens. Eight pens are blue and 12
	markers are not blue. An item is selected at random.:
	a. Plot a table to illustrate the given information
(4	
(4 pts)	
	b. what is the probability that this item is
	i. a blue marker ?
(2 pts)	
	ii. a marker or blue ?
(3 pts)	
	iii. blue given that it is a marker ?
(3 pts)	
	c. It is known that a blue item is selected what is the probability that it is a marker?
(3 pts)	
	d are the events "is blue" and "is not a blue marker" collectively exhaustive?
	u. are the events is blue and is not a blue marker concentively exhaustive?
(3 pts)	

- 6. Of 28 patients investigated on their susceptibility on two genes A and B , it was found that 7 carry the gene A, 12 carry the gene B, and 12 carry neither. A patient is selected at random
 - **a.** What is the probability that the selected patient carries both the two genes?

(4 pts)

b. Given that the patient carries gene A, what is the probability that he carries gene B?

(3 pts)

c. Are the events "carrying gene A" and "carrying gene B" independent?

(4 pts)

- You and your friend are among several candidates running for class representative. You estimate that there is a 45% chance you will win and a 25% chance your best friend will win. What is the probability that either you or your best friend but not both will win the election?
 - 8. There are 7 novels, 5 romans and 2 poetry books on a shelf. If 6 books are picked at random, what is the probability that:
 - **a.** no poetry book is selected?

(4 pts)

(4 pts) **b.** exactly 2 novels and 3 romans are selected?

9. Find the derivative of each of the following functions (do not simplify your answer):

(4 pts) **a.**
$$f(x) = xe^{5x^2} + \log_3(3x - 8) + \ln 6$$

(4 pts)
b.
$$f(x) = \frac{3x + 2^{7x}}{\left(x^2 - 5\sqrt{x} + 4\right)}$$

c.
$$f(x) = (x^{3}e^{2x} \ln x)^{x}$$

(5 pts)