USAL جامعة العلوم والآداب اللبنانية UNIVERSITY OF SCIENCES & ARTS IN LEBANON	**Computer Sciences Dept.** **Makeup-Midterm Exam (Fall/2023)** **Math 204 – Probability and Statistics I**	**Code: EXM-FR 01/1** **ED:2.1**

Stu. Name: **ID Number:**	**Inst. Name: Dr. Soukaina Zayat** **Section: A**	**Booklet Needed: None** **Exam Date: 15/12/2023**
Exam Time: 1h 30 min	**Grade: ……../100**	

Exercise 1: **(18 pts)**

A random sample of 200 adults are classified below by sex and their level of education attained

Education	Male	Female
Elementary	38	45
Secondary	28	50
College	22	17

If a person is picked at random from this group, find the probability that

(a) the person is a male, given that the person has a secondary education

(b) the person does not have a college degree, given that the person is a female

(c) the person is a female.

Exercise 2: **(22 pts)**

(a) In how many ways can 6 people be lined up to get on a bus?

(b) If 3 specific persons, among 6, insist on following each other, how many ways are possible?

(c) If 2 specific persons, among 6, refuse to follow each other, how many ways are possible?

(d) Assume that these 6 people are grouped into three groups according to their ages. In how many ways they can be lined up so that no two of the same age are following each other?

Exercise 3: **(10 pts)**

I toss a coin 10 times. What is the probability that head appears at least 3 times.

Exercise 4: **(18 pts)**

I choose 3 cards from the standard deck of cards.

a) What is the probability that these cards contain at least one ace?
b) What is the probability that these cards are red cards?
c) What is the probability that these cards contain at most one heart?

Exercise 5: **(22 pts)**

Let A, B, and C be three events in the sample space S. Suppose we know $A \cup B \cup C = S$, $P(A)=1/2$, $P(B)=2/3$, $P(A \cup B)=5/6$.

a) Find $P(A \cap B)$.
b) Do A, B, and C form a partition of S?
c) Find $P(C-(A \cup B))$.
d) If $P(C \cap (A \cup B))=5/12$, find $P(C)$.

Exercise 6: **(10 pts)**

Let A and B be two finite sets, with |A|= m and |B|= n. How many distinct functions (mappings) can you define from set A to set B, f: A→B?

Good Luck!!