



**UNIVERSITY OF NEW YORK TIRANA**

EXAMINATION PAPER: ACADEMIC SESSION 2017/2018

DEPARTMENT: Computer Science Department

COURSE: M.Sc. in Computer Science

TITLE OF PAPER: Distributed Systems

Date: June 25, 2018

Duration: 2 hours

Start Time: 6 PM

**YOU MUST ANSWER THE QUESTION IN SECTION-A WHICH IS WORTH 40 MARKS.**

**ANSWER TWO QUESTIONS FROM THE REMAINING THREE QUESTIONS IN SECTION-B, WHICH  
ARE WORTH 30 MARKS EACH.**

**CALCULATORS AND OTHER ELECTRONIC DEVICES ARE NOT PERMITTED**

### Section-A

Question 1 (40 points)

- a) Discuss where the middleware is positioned in the reference model and the services offered by a middleware. [20 points]
- b) Describe and discuss consistency protocols. [20 points]

### Section-B

Question 2 (30 points)

- a) Discuss how a nested transaction is handled in a distributed system. Sketch the schema of a Transaction Processing Monitor. [15 points]
- b) Describe and discuss the Reliable-Multicasting schemes. [15 points]

Question 3 (30 points)

- a) Discuss iterative and recursive look-ups. What is the difference between them? [18 points]
- b) What is the goal of the bully algorithm? Describe this algorithm. [12 points]

Question 4 (30 points)

- a) Describe and critically discuss the overall approach of a publish-subscribe system. [18 points]
- b)
- c) Discuss the security approach for a publish-subscribe system. [12 points]