



DUBLIN INSTITUTE OF TECHNOLOGY

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## BSc. (Honours) Degree in Computer Science

Year 3

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SUPPLEMENTAL EXAMINATIONS 2016/17

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### Cloud Computing [CMPU3007]

INTERNAL EXAMINER  
DR. BASEL MAGABLEH  
DR. DEIRDRE LILLIS  
EXTERNAL EXAMINER  
Mr. Paul Collins

DURATION

2 Hours

ANSWER QUESTION 1 **AND** TWO OF THE OTHER THREE QUESTIONS.  
QUESTION 1 IS **COMPULSORY** & CARRIES 50 MARKS.  
ALL OTHER QUESTIONS CARRY 25 MARKS.

- 1 (a) Give a definition of *Distributed Systems*, identifying and describing 4 key characteristics.  
(11 marks)
- (b) Identify and discuss 5 challenges of storing data in cloud computing infrastructure.  
(10 marks)
- (c) Distinguish between *IaaS*, *PaaS*, and *SaaS* cloud infrastructure models, give an example for each in your answer.  
(9 marks)
- (d) Identify 5 architectural constraints of *RESTful APIs*, and clearly explain the difference between *client-server* and *RESTful APIs* models in term of those constraints.  
(10 marks)
- (e) Explain your understanding of *NOSQL* databases and identify 3 main features of *NOSQL*.  
(10 marks)

2. (a) Discuss in detail 4 Security implications of cloud computing

(8 marks)

(b) Describe the function of the following *Docker* commands and briefly explain the purpose of each of the parameters.

- `curl -s -X GET -H 'Accept: application/json' http://localhost:8080/containers | python -m json.tool`
- `docker run -d -p 8080:5000 lab6`
- `docker create -v /data --name photos lab6 /bin/true`

(9 marks)

(c) Describe the concept of Grid Computing, and discuss **four** benefits of Grid Computing.

(8 marks)

3. (a) Describe 4 key features of Docker containers. Give an example of how Docker can be used to solve software interoperability.

(8 marks)

(b) Discuss what is meant by the term *Metadata*, and explain 4 advantages of having *Metadata* in cloud-based storage.

(8 marks)

(c) Identify the Properties of ACID transactions, and describe three challenges facing RDBMS in cloud-based storage.

(9 marks)

4. (a) Identify and describe three examples of cloud computing infrastructures.

(9 marks)

(b) Discuss the immediate impact of Cloud Computing on business innovation.

(8 marks)

(c) Discuss in detail 4 key features of AWS SQS.

(8 marks)

SAMPLE