



DUBLIN INSTITUTE OF TECHNOLOGY

DT228 BSc. (Honours) Degree in Computer Science

Year 3

WINTER EXAMINATIONS 2017/2018

CLOUD COMPUTING [CMPU3007]

DR. BASEL MAGABLEH
DR. DEIRDRE LILLIS
DR. MARTIN CRANE

TUESDAY 16TH JANUARY

2.00 P.M. – 4.00 P.M.

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) Define the following terms:

- I. Docker Swarm
- II. Docker Services
- III. Docker Stack
- IV. Docker Images
- V. Docker Containers

(15 marks)

(b) Give a definition of *Scalability*, describe four key benefits of scaling a service in a cloud infrastructure.

(11 marks)

(c) Describe and distinguish between the *continuous deployment* and *continuous integration* models.

(5 marks)

(d) Distinguish between *IaaS*, *PaaS*, and *SaaS* cloud infrastructure models, give an example for each in your answer.

(9 marks)

(e) Explain your understanding of cloud databases and identify three main features of NOSQL.

(10 marks)

2. (a) Define and distinguish between *full virtualisation* and *para virtualisation*.

(8 marks)

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

- I. `docker run -d --name uploader1 --volumes-from datastore1 base-img`
- II. `docker service create --replicas 2 -p 80:5000 --name web alpine:3.4`
- III. `docker create -v /data --name mydata lab6 /bin/true`

(9 marks)

(c) Describe four key benefits of service availability and reliability in the context of cloud computing.

(8 marks)

3. (a) Describe four key features of Docker Swarm. Give an example of how Docker Swarm can be used to solve the problem of service discovery.

(8 marks)

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

(8 marks)

- (c) Identify four architecture constraints for RESTFUL APIs.

(9 marks)

4. (a) Identify and describe the security Implications of Cloud Computing.

(8 marks)

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

(8 marks)

(c) Define AWS Simple Queue Service (SQS) and describe four benefits from employing AWS SQS in a software solution.

(9 marks)