



DUBLIN INSTITUTE OF TECHNOLOGY

DT228 BSc. (Honours) Degree in Computer Science

Year 3

WINTER EXAMINATIONS 2016/2017

Cloud Computing [CMPU3007]

INTERNAL EXAMINER
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WEDNESDAY 11TH JANUARY 1.00 P.M. – 3.00 P.M.

Two Hours

Question 1 is **compulsory**.
Answer question 1 **and** two of the other three questions.

- 1 (a) Briefly explain each of the following *deployment modes* of cloud computing, as proposed by the US National Institute of Standards and Technology (NIST):
- Public
 - Private
 - Community
 - Hybrid
- (12 marks)
- (b) Compare and contrast the business model advantages of cloud computing with traditional hosting models. Mention three.
- (10 marks)
- (c) Describe two examples of virtualised computing in the cloud.
- (10 marks)
- (d) Briefly describe three examples of cloud infrastructure services with reference to services you have previously used or researched.
- (9 marks)
- (e) Briefly describe three advantages of architecting distributed applications in the cloud.
- (9 marks)

2. (a) What is meant by a *trustworthy* encryption system?

(5 marks)

(b) Distinguish between symmetric encryption and asymmetric encryptions systems.

(8 marks)

(c) Describe how docker can be used to solve the increasing interoperability issues associated with a growing number of software products and versions used in a cloud services.

(12 marks)

3. (a) What is meant by *platform-as-a-service* model in the context of cloud computing?

(5 marks)

(b) Describe a platform-as-a-service offering that you have used or studied. Give an example of how it can be used and how it could be deployed to a large scale application.

(10 marks)

(c) Describe the core features of the AWS SQS service. Give an example of how it could be used.

(10 marks)

4. (a) Why must distributed, columnar databases settle for *eventual consistency* rather than full ACID properties available in relational databases?

(5 marks)

- (b) What has motivated the recent development of NoSQL database architectures? Give an example of an application that would be well suited to this kind of data storage model.

(10 marks)

- (c) Discuss the use of the PAXOS Algorithm.

(10 marks)