



**INSTITUTE OF TECHNOLOGY TRALEE**

**WINTER EXAMINATIONS AY 2018- 2019**

**Advanced Database Programming**

**Module Code DBMS81001**

**CRN 48064**

**External Examiner:** Mr. Sean McHugh

**Internal Examiner:** Mr. Peter Given

**Duration:** 2 Hours.

**Instructions to Candidates:**

- i) Answer any **three** questions.
  - ii) All questions carry equal marks. Submit all your rough-work, marks may be lost otherwise.
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**Question 1:**

- i) Compare and contrast CouchDB with the relational database PostgreSQL. **(14 marks)**
- ii) Describe a use case for an application that would benefit by using CouchDB as its database and explain why using CouchDB benefits the application. **(9 marks)**
- iii) Write a note on the use of a) **JSON** and b) the use of **\_id** in CouchDB. **(10 marks)**

**Question 2:**

- i) Describe the consistency model in both MongoDB and CouchDB and explain one strength and one weaknesses of each model. **(12 marks)**
- ii) You are asked to write a report to help in choosing between MongoDB or PostgreSQL for a project. Discuss four categories of comparison you think would be relevant in your report. **(12 marks)**
- iii) Discuss how and why MongoDB uses sharding, giving examples where appropriate. **(9 marks)**

**Question 3:**

- i) Compare and contrast Redis with Neo4J, showing examples where appropriate. (12 marks)
- ii) Describe, using an example, how the Redis's Publish Subscribe model works. (10 marks)
- iii) Discuss the CAP theorem and explain where Redis sits in relation to this theory. (11 marks)

**Question 4:**

- i) Compare and contrast HBase and MongoDB. (8 marks)
- ii) Discuss, using an example, the architecture of HBase tables and discuss one advantage of using column families in HBase. (14 marks)
- iii) Discuss HBase's use of Region Servers and the META table to manage the sharding of data. Use diagrams where appropriate. (11 marks)