INSTITUTE OF TECHNOLOGY TRALEE

WINTER EXAMINATION AY 2016- 2017

Advanced Database Programming

Module Code DBMS 81001
CRN 48064

External Examiner: Mr Sean McHugh

Internal Examiner: Mr. P 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.

Question 1:

i) Compare and contrast CouchDB with PostgreSQL. **(14 marks)**

ii) Describe the features of CouchDB which make it a good fit in asynchronous environments. **(9 marks)**

iii) Write a note on the use of JSON and _rev in CouchDB. **(10 marks)**

Question 2:

i) Explain how Map-Reduce works in MongoDB, giving examples to support your answer. **(13 marks)**

ii) Write a note on a) server side commands and b) gridFS in MongoDB, giving examples to support your answer. **(10 marks)**

iii) Explain the CAP theorem and describe how MongoDB keeps its CAP theorem guarantees. **(10 marks)**

Question 3:

i) Discuss the strengths and weaknesses of Redis. **(10 marks)**

ii) Write a note on a) the durability model in Redis and b) publish subscribe in Redis. **(10 marks)**

iii) Discuss, using an example, the architecture of HBase tables and discuss the advantage of using column families in HBase. **(13 marks)**

Question 4:

i) Discuss the strengths and weaknesses of RIAK. **(12 marks)**

ii) Describe how Riak controls reads and writes to the cluster and compare consistency by read and consistency by write in Riak. **(12 marks)**

iii) Using and example, discuss how and why RIAK uses vector clocks. **(9 marks)**