INSTITUTE OF TECHNOLOGY TRALEE

AUTUMN EXAMINATION AY 2016- 2017

Advanced Database Programming

Module Code DBMS 81001
CRN 48065

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)   Explain how Map-Reduce works in CouchDB, giving an examples where appropriate.   **(13 marks)**
ii)   Discuss the strengths and weaknesses of CouchDB.   **(10 marks)**
iii)   Write a note on conflict resolution in CouchDB.   **(10 marks)**

Question 2:

i)   Compare and contrast MongoDB with relational databases.   **(12 marks)**
ii)   Write a note on the use of 1) Javascript and the MongoDB shell and 2) indexing in Mongo.   **(10 marks)**
iii)   Discuss the concept of sharding in MongoDB, giving an example and briefly describe the steps to build a sharded dataset with two servers.   **(11 marks)**

Question 3:
i)   Compare and contrast Redis with HBase showing examples where appropriate.
                                                                    (10 marks)
ii)   Describe, using an example, how the Redis Publish Subscribe model works.
                                                                    (10 marks)
iii)   Discuss the following aspects of durability in Redis; no durability, snapshotting, append-only file and discuss the advantages and disadvantages of each.

                                                                    (13 marks)

Question 4

i) Discuss the architecture of the Riak ring and discuss the advantage this ring gives to Riak. **(12 marks)**

ii) Describe Riak's use of N,W,R parameters and compare 1) consistency by quorum and 2) eventual consistency in Riak. **(12 marks)**

iii) Write a note on 1) hinted handoff and 2) conflict resolution in RIAK. **(9 marks)**