

# B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

## February / March 2023 Semester End Main Examinations

**Programme: B.E.**

**Branch: Computer Science and Engineering**

**Course Code: 21CS7PENSD**

**Course: NoSQL Database**

**Semester: VII**

**Duration: 3 hrs.**

**Max Marks: 100**

**Date: 28.02.2023**

**Instructions:** 1. Answer any FIVE full questions, choosing one full question from each unit.  
2. Missing data, if any, may be suitably assumed.

### UNIT - I

- 1 a) Describe the Hadoop architecture with major elements of the Hadoop and HBase datastore. **10**
- b) Differentiate between the storage architecture of RDBMS and Column Oriented databases with necessary tables. **10**

### UNIT - II

- 2 a) Explain MongoDB Architecture with suitable diagram. **10**
- b) Write queries in Hive for the following **5**
  1. Create a database Emp with Name, ID, Age, Gender and Dept\_ID as the fields
  2. Load the data into EMP from a local csv file Emp\_details.csv
  3. Select employees whose age is 40 and name is 'Akash'
  4. Print the name of the employees in descending order
  5. Print Number of Employees working in each department

- c) Consider a collection score that contains the following documents: **5**

```
{ "_id" : 1, "userid" : "newbie" }
{ "_id" : 2 "userid" : "abby", "score" : 82 }
{ "_id" : 3 "userid" : "nina", "score" : 90 }
```

The collection has a sparse and unique index on the field score

```
db.scores.createIndex( { score: 1 } , { sparse: true, unique: true } )
```

Indicate the output of the following queries applied on score collection above.

Justify your answer

1. `db.scores.find().sort( { score: -1 } )`
2. `db.scores.find().sort( { score: -1 } ).hint( { score: 1 } )`
3. `db.scores.insertMany( [`  

```
{ "userid": "AAAAAAA", "score": 82 },
{ "userid": "AAAAAAA", "score": 82 } ] )
```

**OR**

- 3 a) Demonstrate the Apache Cassandra Indexing commands for the below given requirement. Design a database to store student feedback details like USN, course, sem and rating. Maintain Index to retrieve data based on course and Ratings. **10**
- b) With a suitable example explain the different types of user-defined Indexing in MongoDB. **10**

**UNIT - III**

- 4 a) Mention the advantage of Google App Engine and write a sample code to connect it with python datastore API. **10**
- b) Design map and reducer function to upload Stock dataset into a HBase database. Consider the below columns in the dataset: **10**  
\_id, date, Open\_stock\_price, Closed\_Stack\_Price, High\_stock\_price, Low\_stock\_price, stock\_volume.

**UNIT - IV**

- 5 a) Explain the MongoDB Wire Protocol with inserting and querying a collection example. **10**
- b) Demonstrate with a sample code to use the Django web framework in connecting NoSQL **10**

**UNIT - V**

- 6 a) Consider a blog application that will contain the following pair of collections: **10**  
• posts: Contains the posts added to the database. Each post will contain a title, date, and author info that is accessed through DBRef. Each post can also contain a range of comments added by people who view the posts.  
• authors: Contains any information related to the posts' authors, assuming there is more than one author.  
Assuming that the collections are populated with appropriate data, write code to demonstrate the following concept: Paging with PHP and MongoDB.
- b) Write queries for the following using PHP driver for MongoDB database. **10**  
i. Connect to a database and create a collection of your choice.  
ii. Insert the data into the created collection.  
iii. Query the collection to list all the records.  
iv. Perform sort operation.  
v. Get last three records.

**OR**

- 7 a) Demonstrate with an example how to create links between two different documents stored in different locations with and without using DBRef in Mongoddb with Pymongo driver. **10**
- b) Demonstrate the administration tools available to backup and restore the MongoDB system. **10**

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