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

**Autonomous Institute Affiliated to VTU**

## August 2024 Supplementary Examinations

**Programme: B.E.** **Semester: VII**
**Branch: Computer Science and Engineering** **Duration: 3 hrs.**
**Course Code: 21CS7PENSD** **Max Marks: 100**
**Course: NoSQL Database**

**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) Define NoSQL. Discuss the challenges associated with RDBMS. **6**

b) Consider the following Apache web server request and response attributes stored in a Collection named logdata. **6**
IP address of the client, Identity of the client, User name as identified during authentication, Time when the request was received, the request itself, Status code, Size of the object returned, Referrer, User-agent.
Write the code to Persist the data in the MongoDB by applying appropriate utility function to create dictionaries

c) Demonstrate different types of NoSQL databases and categorize them in terms of their features and attributes. **8**

### UNIT - II

2 a) Demonstrate with an example the need and method of representing Column Databases as Nested Maps of Key/Value Pairs **6**

b) Write queries in Hbase to do the following **6**

a. Create and maintain a catalog of different types of products, where the amounts of information on the type, category, characteristics, price, and source of the product could vary widely.

b. To create a record with the following fields
type:category = “coffee beans”
type:name = “arabica”
type:genus = “Coffea”
characteristics: cultivation_method = “organic”
characteristics: acidity = “low”
source: country = “yemen”
source: terrain = “mountainous

c. Store “beans” instead of its original value of “coffee beans” a second time

d. To look at the last four versions of the type: category field

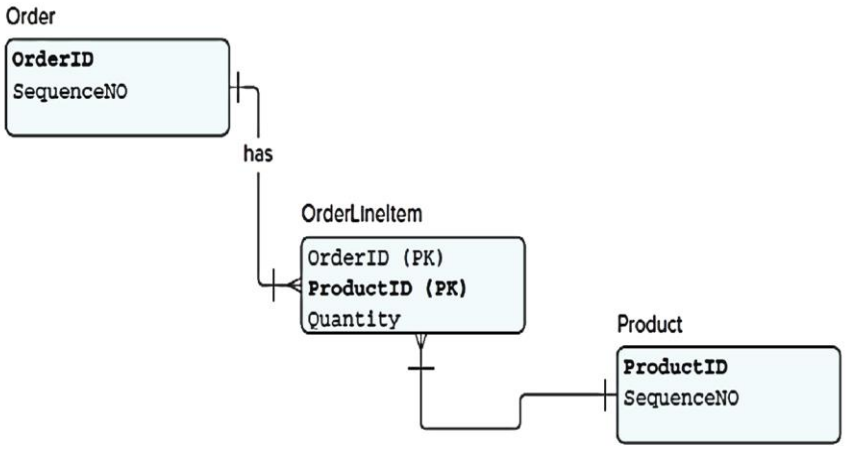
c) Demonstrate how Disaster Recovery and Scaling are handled by MongoDB. **8**

**OR**

3 a) Differentiate between the following Redis commands. **6**

1. SMEMBERS, sadd and zadd 2. HGET, HGETALL and HMGET

b) Consider the following retail system --which creates and manages order records. Each person's purchase at this fictitious store is an order. An order consists of a bunch of line items. Each order line item includes a product (an item) and number of units of that product purchased. A line item also has a price attribute, which is calculated by multiplying the unit price of the product by the number of units purchased **6**




Write queries in mongodb to

1. Create and save Order and Product Collections with unit price stored in Product collection
2. Get all the documents in the orders collection
3. Get all the orders after October 25, 2010, that is, with order_date greater than October 25, 2010.
4. Get all documents from the orders collection where line item name is latte

c) Demonstrate the need of indexes in Mongodb. List and explain the various operations that could be performed using indexes in MongoDB **8**

**UNIT - III**

4 a) Write queries in GQL for the following by identifying appropriate Model class **6**

1.Create a Class called Book with properties title, author, Copyright_year, author_birthdate.

2. Create two objects of the class Book with key name Book1 and Book2. Book2 do not have a birthdate

3. Display key of Book2

4. Retrieve four Books entities with copy right year 1997 and print the title of the same in ascending order

5. Traverse through the entire result set obtained in (2)

b) Consider a collection called User with the following fields: **6**
UserID, Gender, Age, Occupation, Zip-code
Write map reduce functions to find the total number of males and females in User collection. Call the function to display the same.

c) List the main parts of taste-web recommender application. Design a recommendation system on a simple file, named ratings.csv to get the top 5 recommendations. Each line of this file has user_id, item_id, ratings. **8**

**UNIT - IV**

5 a) Examine the various features that supports Cassandra's core architecture. **6**

b) Write queries for the following when Mongodb is used with Rails. **6**

- Create a simple Model class that leverages mongo_mapper
- Persist the model object using a controller
- Invoke this action using a REST-style URL

c) List the drawbacks of Using Memcached with MySQL. Demonstrate how HandlerSocket plugin for MySQL is beneficial over Memcached with MySQL **8**

**UNIT - V**

6 a) Demonstrate with an example how to create links between two different documents stored in different locations with and without using DBRef in Mongodb with PHP driver. **10**

b) 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. You use DBRef to query this information.
Assuming that the collections are populated with appropriate data, write code to demonstrate the following concept: Paging with PHP and MongoDB

**OR**

7 a) Illustrate the steps to be followed in the process of taking backup of all the databases present in the MongoDB server and restoring the same. Write a backup script that creates archives in a specified directory. **10**

b) Demonstrate with an example how the following command works in MongoDB connected through Python **10**
a. Finding multiple documents
b. Sort
c. Count
d. Slice
e. Push

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