KUMARAGURU
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B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2023
(Regulation 2018)
Fifth Semester
COMPUTER SCIENCE & ENGINEERING
U18CSI5203-NOSQL Databases

COURSE OUTCOMES
CO1: Outline fundamental concepts in the context of a number of different NOSQL products.
CO2: Construct refined logical database model with consideration of data semantics and dependency.
CO3: Build a database system and demonstrate competence with the fundamental tasks involved with its modeling, designing, and implementation.
CO4: Examine MongoDB tools to develop and deploy various applications.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1. List the merits of NOSQL databases over RDBMS	CO1	[K_1]
2. Outline the principle of Horizontal scaling and Vertical scaling to achieve scalability.	CO1	[K_2]
3. What is the unique identification number of every document in MongoDB? Illustrate it's structure	CO2	[K_1]
4. Recall the significance of shell mode and strict mode.	CO2	[K_2]
5. Why aggregation framework is preferred over single purpose methods?	CO2	[K_1]
6. Brief about the Gossip protocol in Cassandra	CO3	[K_2]
7. What is full stack web framework? List few full stack web frameworks	CO3	[K_3]
8. Build PHP code to connect and create a database	CO4	[K_2]
9. Express the syntax for creating user with roles and display the list of users in the database	CO4	[K_2]
10. Recall the ways to migrate the database from MySQL to NOSQL database.	CO4	[K_2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Illustrate and explain about the graph and document oriented databases and it use cases	8	CO1	[K_2]
	b)	State the CAP theorem and identify the properties that are assured by MongoDB database	8	CO1	[K_2]
12.	a)	Illustrate the MongoDB architecture and its components.	8	CO2	[K_2]
	b)	Explain the architecture of HBASE database	8	CO2	[K_2]
13		Consider the following faculty collection with documents given below	16	CO3	[K_3]

{ "name":"Krish", "age":35,"gender":"M","exp":10,subjects:["DS","C","OS"],"type":"Full Time","qualification":"M.Tech" },
{ "name":"Manoj", "age":38,"gender":"M","exp":12,subjects:["JAVA","DBMS"],"type":"Full Time", "qualification":"Ph.D"},
{ "name":"Anush", "age":32,"gender":"F","exp":8,subjects:["C","CPP"],"type":"Part Time","qualification":"M.Tech" },

{ "name":"Suresh",
"age":40,"gender":"M","exp":9,subjects:["JAVA","DBMS","NETWORKING"],"type":"Full Time", "qualification":"Ph.D"},
{ "name":"Rajesh", "age":35,"gender":"M","exp":7,subjects:["DS","C","OS"],"type":"Full Time","qualification":"M.Tech" },
{ "name":"Mani",
"age":38,"gender":"F","exp":10,subjects:["JAVA","DBMS","OS"],"type":"Part Time", "qualification":"Ph.D"},
{ "name":"Sivani",
"age":32,"gender":"F","exp":8,subjects:["C","CPP","MATHS"],"type":"Part Time","qualification":"M.Tech" },
{ "name":"Nagesh",
"age":39,"gender":"M","exp":11,subjects:["JAVA","DBMS","NETWORKING"],"type":"Full Time", "qualification":"Ph.D"},
{ "name":"Nagesh",
"age":35,"gender":"M","exp":9,subjects:["JAVA",".Net","NETWORKING"],"type":"Full Time", "qualification":"Ph.D"},
{ "name":"Latha", "age":40,"gender":"F","exp":13,subjects:["MATHS"],"type":"Full Time", "qualification":"Ph.D"}

Construct MongoDB queries for the following:
  i.   Get all the faculty members whose qualification is "Ph.D".
  ii.   Get all the faculty members whose experience is between 8 to 12 years.
  iii. Get all the faculty members who teach "JAVA" or "NETWORKING".
  iv.   Get all the faculty members who teach "MATHS" and whose age is more than 30 years and qualification must be "Ph.D".
  v.   Get all the faculty members who are working part-time or who teach "JAVA".
  vi.   Update the data of all faculty members by incrementing their age and experience by one year.
  vii. Update the faculty "Sivani" with the following data: update qualification to "Ph.D" and type to "Full Time".
  viii. Sort the faculty details by their age (descending order) and get the details of the first five faculty members only.

14.	a)	Recall the syntax of MongoDB utility commands for importing and exporting data to /from csv,Json,Json array	8	CO4	[K$_2$]
	b)	Summarize the internals of Berkeley DB and explain about any one storage configuration.	8	CO4	[K$_2$]
15.	a)	Outline the features of Django Framework with its MVT architecture and components	8	CO3	[K$_2$]
	b)	Make use of Pymongo for MongoDB server connection and perform CRUD operation.	8	CO3	[K$_3$]
16.	a)	Discuss about the aggregation pipeline and the stage operators with its syntax	8	CO2	[K$_2$]
	b)	Relate the significance of MongoDB indexing and syntactically outline the various types of MongoDB indexes	8	CO2	[K$_2$]

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