Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 30144

M.C.A. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Second Semester

MC 4202 — ADVANCED DATABASE TECHNOLOGY

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How do you control concurrency in a distributed database?

2. Why does obtaining indexes on a table can increase concurrency, as well as decrease IC the time needed to access the table?

3. What is a multimedia database? Give example

4. How deductive database rules are generated?

5. How CAP theorem is used in outlining the desirable properties of a database?

6. What is meant by sharding?

7. A type appropriate for the letter grades that students receive on completion of a course is A, A–, B+, B, B–, C+, C, C–, D, and F. Express this type in XML schema using pattern attribute.

8. What is well formed XML document?

9. List the methods of information retrieval.

10. What is search analytics in web?

how you will add a...
the process in...

PART B — (5 × 13 = 65 marks)

11. (a) Exemplify in detail about distributed query processing in database.

Or

(b) (i) Give examples of schedules that have the following properties.

- The schedule is serializable, but not in commit order
- The schedule is serializable, but has a dirty read
- The schedule is not serializable, but does not have a dirty read, a non-repeatable read, or a lost update
- The schedule would be permitted at the READ COMMITTED isolation level, but is serializable (6)

(ii) Illustrate in detail about distributed database management systems. (7)

12. (a) (i) Describe about temporal Data and temporal Consistency. (6)

(ii) Discuss in detail about mobile transaction model. (7)

Or

(b) Explain in detail about spatial database, its data types. operators, and queries techniques with examples.

13. (a) Explain in detail about MongoDB features, operations and indexing with relevant examples.

Or

(b) Discuss in depth about HIVE database features, operations and partitioning with relevant examples.

14. (a) (i) Consider the below XML document,

```
<?xml version="1.0" encoding="UTF-8"?>
<student>
<firstName>Luca</firstName>
<lastName>Rossi</lastName>
<id>281283</id>
<plan>
<courses year="3">
<course>
<name> Programmazione Orientata agli Oggetti </name>
<shortName>POO</shortName>
<record>
<grade>30</grade>
<date>13/06/11</date>
</record>
</course>
<course>
<name>Analisi e progettazione del software</name>
<shortName>APS</shortName>
</course>
</courses>
</plan>
</student>
```

Create a DTD for the above document. (7)

(ii) Illustrate in detail about XQuery FLWOR Expressions with example. (6)

Or

(b) Consider the below XML

```
<?xml version="1 .0" encoding="UTF-8"?>
<email>
<from> luca.rossi.917@gmail.com </from>
<to> atzeni@dia.uniroma3.it </to>
<content>
Dear <person> Paolo </person>,
here are some very hard exercises for the upcoming assignment of
<course> Basi di Dati 2 </course>:
<exercises>
<exercise>
<topic> DTD </topic>
<description> From Instance to DTD </description>
</exercise>
<exercise>
<topic> XPath </topic>
<description> Find students with average grade better than 26
</description>
</exercise>
</exercises>
Best Regards,
<person> Luca </person>
</content>
</email>
```

Create a XML schema for the document.

15. (a) Describe in detail about information retrieval models with examples.

Or

(b) (i) Explain about types of queries in IR system with example. (7)

(ii) Illustrate about text preprocessing techniques in IR system. (6)

PART C — (1 × 15 = 15 marks)

16. (a) Exemplify in detail about Cassandra database model and its features. Design and model a database for Music Play list application.

Or

(b) Formulate the following XPath queries for the document of the form

<Classes>

<Class CrsCode="C6308" Semester="F1997">

<CrsName>Software Engineering</CrsName>

<Instructor>Adrian Jones</Instructor>

</Class>

<Class CrsCode="EE101" Semester="F1995">

<CrsName>Electronic Circuits</CrsName>

<Instructor>David Jones</Instructor>

< /Class>

....

....

</Classes>

(i) Find the names of all courses taught by Mary Doe in fall 1995.

(ii) Find the set of all document nodes that correspond to the course names taught in fall 1996 or all instructors who taught MATI 23 1997.

(iii) Find the set of all course codes taught by John Smyth in spring