

Advance Database Management (315324)

MSBTE Diploma · K-Scheme · Model Question Paper — Set A

Time: 3 Hours**Max. Marks: 70****Instructions:**

1. All questions are compulsory.
2. Answer each next main question on a new page.
3. Illustrate your answers with neat sketches wherever necessary.
4. Figures to the right indicate full marks.
5. Assume suitable data, if necessary.
6. Mobile phone, pager and any other electronic communication devices are not permissible in the examination hall.

Q.1 Attempt any FIVE of the following:**10**

- a) Define concurrency control. List any two concurrency control protocols.
- b) Define shared lock and exclusive lock.
- c) State any four advantages of a distributed database system.
- d) Define FLWOR expression. Write its general form.
- e) Write the syntax to create a subtable using table inheritance in SQL.
- f) List any four types of NoSQL databases with one example of each.
- g) Define data warehouse. State any two of its characteristics.

Q.2 Attempt any THREE of the following:**12**

- a) Explain the architecture of a centralized database system with a neat diagram.
- b) Explain shared-memory and shared-disk architectures of parallel database systems with neat diagrams.
- c) Explain table inheritance in SQL with a suitable example.
- d) Explain the basic CRUD operations performed in the MongoDB shell with an example of each.

Q.3 Attempt any THREE of the following:**12**

- a) Explain the Two-Phase Locking (2PL) protocol with an example.
- b) Compare SQL and NoSQL databases. (Any four points)
- c) Explain the structure of XML data with a suitable example.
- d) Draw and explain the components of a data warehouse.

Q.4 Attempt any THREE of the following:**12**

- a) Define speedup and scaleup. A query takes 48 seconds on a single-processor system and 15 seconds on a parallel system with 4 processors. Calculate the speedup and state whether it is linear or sublinear.

- b) Consider the following XML document *college.xml*:

```
<college> <student roll="1" branch="IF">
<name>Asha</name><marks>82</marks></student> ...
</college>
```

 (five students, assume data).
Write XPath expressions to: i) select names of all students ii) select the student whose roll is 3 iii) select names of students having marks greater than 75 iv) count the students of IF branch.
- c) Consider the collection *students* with fields name, branch, marks, city. Write MongoDB queries using find() to display:
i) students having marks greater than 70 ii) students of branch "IF" or "AN" iii) only name and marks of all students (without _id) iv) students from "Pune" having marks less than 60.
- d) Explain any four applications of data mining.
- e) Explain homogeneous and heterogeneous distributed databases.

Q.5 Attempt any TWO of the following:

12

- a) Explain Array and Multiset types in SQL with a suitable example.
- b) Explain any three advantages and any three disadvantages of distributed database systems.
- c) Consider XML documents *books.xml* (book: isbn, title, pub_id, price) and *publishers.xml* (publisher: pub_id, name, city). Write XQuery to:
i) list titles of books having price more than 500, sorted on price ii) display each book title with the city of its publisher (join) iii) for every publisher, display the publisher name with the titles of its books (nested query).

Q.6 Attempt any TWO of the following:

12

- a) Explain the process structure of a transaction-server system with a neat diagram.
- b) Write MongoDB shell commands to: i) create/use database *shop* ii) insert five documents into collection *products* (name, price, qty) using insertMany() iii) display all documents iv) change the price of 'Mouse' to 550 v) delete products whose qty is 0 vi) display the remaining products.
- c) Explain classification and clustering in data mining with a suitable example of each.

Note: This is a **model question paper prepared by Ananda Technologies** only for practice and exam preparation, based on the pattern of previous MSBTE question papers and the K-scheme syllabus. It is **not an official MSBTE paper**, and it does **not** mean that these questions will come in the exam. Answers follow standard textbook points; marks shown are indicative. Free for students — anandatechnologies.in