

NOTE: There are 9 Questions in all.

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. Structured data may include which of the following?

- | | |
|-----------------|-----------------------|
| (A) Photo image | (B) Video clip |
| (C) Dates | (D) None of the above |

b. Metadata enables database designers and users to do all of the following except:

- (A) sample data
- (B) understands what data exist
- (C) what the fine distinctions are between similar data items
- (D) what the data mean

c. In enterprise data modelling, which is incorrect?

- (A) You review current systems
- (B) You implement the new database
- (C) You describe the data needed at a very high level of abstraction
- (D) You plan one or more database development projects

d. Which is not a relevant feature of CASE tools?

- (A) The ability to help draw data models using entity-relationship notations
- (B) The ability to generate code
- (C) An information repository
- (D) Access to a DB via the Internet

e. A subtype entity name should be which of the following?

- | | |
|---------------------|----------------------------------|
| (A) A singular noun | (B) Specific to the organization |
| (C) Concise | (D) All of the above |

- f. The blocking factor is:
- (A) a group of fields stored in adjacent memory.
 - (B) the number of physical records per page.
 - (C) attributes grouped together by the same primary key.
 - (D) attributes grouped together by the same secondary key.
- g. A rectangle represents which of the following in an EER?
- (A) Attribute
 - (B) Entity
 - (C) Optional One
 - (D) Relationship
- h. An oval represents which of the following in an EER?
- (A) Attribute
 - (B) Entity
 - (C) Optional One
 - (D) Relationship
- i. Which of the following is not a factor to consider when switching from small to large block size?
- (A) The length of all of the fields in a table row
 - (B) The number of columns
 - (C) Block contention
 - (D) Random row access speed
- j. Which of the following improves a query's processing time?
- (A) Write complex queries
 - (B) Combine a table with itself.
 - (C) Query one query within another
 - (D) Use compatible data types

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

- Q.2** a. What are the different types of database end users? State the main activities of each? (8)
- b. Describe some types of database utilities and tools and their functions? (8)
- Q.3** a. Explain entity type and entity set? (4)
- b. Describe the characteristics of a relation? (6)
- c. What is meant by recursive relationship type? Give some example of recursive relationship types. (6)

- Q.4** a. How does Tuple relational calculus differ from domain relational calculus? (8)
b. Explain the mapping of weak entity for E.R. model to relational model. (8)
- Q.5** Write SQL Queries for the following:
(i) Create a database having relations
Department (DNo, DName, EMPID)
Employee (EMPID, EmpName, DNo, Sal)
Project (PID, PName, EMPID, Location)
Enforce Referential and entity integrity in above relation. (10)
(ii) Show the resulting salaries if every employee working on the '*ProductX*' project is given a 10 percent raise? (2)
(iii) Update *Employee* table of employee working in 'IT' department with salary increase by 1000. (2)
(iv) Delete *Project* table. (2)
- Q.6** a. Why should nulls in a relation is avoided as far as possible? Describe the problem of spurious Tuple and how we may prevent it? (8)
b. Discuss normalization of relations. (8)
- Q.7** a. Explain lossless join decomposition into BCNF scheme. (10)
b. Explain dependency preserving decomposition into 3NF scheme. (6)
- Q.8** a. Explain the buffering of blocks in data transfer. (8)
b. Write a note on Hashing Techniques. (8)
- Q.9** a. What do you mean by cost component of query optimization? (8)
b. Explain the implementation of aggregate operation? (8)