Grade 10 Computer, Explained

Unit 2 · Database Management System

ANSWER KEY · FOR TEACHERS

Full marks 38

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Key words

1. data
2. information
3. DBMS
4. field
5. record
6. foreign key
7. constraint
8. %

K · 4

Each carries 0.5 mark.

2 Label the diagram

1. primary key no two the same, never empty
2. field name
3. field (column) one kind of fact for every student
4. record (row) all about one student

K · 2

Each carries 0.5 mark.

3 Multiple choice

i. **b.** UPDATE — K · 1

UPDATE … SET … WHERE changes existing values.

ii. **d.** DATE — K · 1

DATE stores only the date. TIME stores only a time, and DATETIME and TIMESTAMP store both.

iii. **c.** data integrity — U · 1

Data integrity means keeping the data correct by rules: here, a rule that marks are between 0 and 100. Redundancy control is about not storing the same data twice.

iv. **b.** 1,250 — A · 1

One record per book: 1,250 rows. The 4 fields are the columns. (5,000 is the number of values: 1,250 × 4.)

v. **b.** `'%ika'` — A · 1

`%` before “ika” allows anything before it, and nothing after. `'ika%'` finds names that start with “ika”; `'_ika'` only four-letter names; `'%ika%'` also finds “Mallika Shah”, where “ika” is in the middle.

4 Match the columns

1. CREATE → **d.** makes a new table or database
2. ALTER → **c.** adds, deletes or changes a column of a table
3. DROP → **e.** deletes a whole table, structure and all
4. DELETE → **b.** removes the rows that match a condition

K · 2

Each carries 0.5 mark.

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5 Short answers

a. MARKING SCHEME U · 2

- ✓ A primary key identifies each record of its own table; a foreign key refers to the primary key of another table and links the two tables.
- ✓ A primary key's values can't repeat and can't be NULL, and a table has only one; a foreign key's values can repeat (many rows can point to the same record), and a table can have several (or any other correct difference).

b. MARKING SCHEME U · 2

- ✓ i. DATE; ii. DECIMAL (money must be exact, such as DECIMAL(8,2)).
- ✓ iii. VARCHAR (or CHAR(10): nobody calculates with a phone number, and it is too big for INT); iv. BOOLEAN.

c. MARKING SCHEME U · 2

- ✓ One-to-many: one house has many students, but each student is in one house.
- ✓ The foreign key (the house's ID) goes in the students table, the "many" side.

6 What does it show?

ANSWER A · 6

i.

Name	Class
Aashish Shah	9
Aman Gurung	9

ii. `'_a%'` means any one letter, then a, then anything: names whose **second** letter is a.

ID	Name
3	Nabin Dahal
4	Aashish Shah
8	Sabin Chapagain

iii. Ashna Rimal (ID 5) moves to Class 10; Binay Adhikari and Sabin Chapagain (Thimi) are deleted. Left in Class 10: IDs 1, 3, 5, 6; in Class 9: IDs 4, 7.

Class	COUNT(*)
9	2
10	4

MARKING SCHEME

- ✓ i. Two rows, Aashish Shah and Aman Gurung, with the column headings Name and Class.
- ✓ i. Their class, 9, beside each name, and no other row (Dikshya Pokhrel lives in Bhaktapur but is in Class 10).
- ✓ ii. Nabin Dahal (3) and Sabin Chapagain (8).
- ✓ ii. Aashish Shah (4) too, since "Aa" has a as its second letter; nobody else.
- ✓ iii. Class 10: 4 (Ashna moved to Class 10, Binay deleted).
- ✓ iii. Class 9: 2 (Ashna moved out, Sabin deleted).

7 Find and fix the errors

ANSWER

- Line 4: there is a comma after the last column, so the DBMS reports a syntax error near `)`. Correct: `Price DECIMAL(6,2)`.
- Line 6: the text Muna Madan has no quotes, so it is read as names, not text: a syntax error. Correct: `INSERT INTO books VALUES (1, 'Muna Madan', 150);`

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- Line 7: without WHERE, the UPDATE changes the price of **every** book, not only book 1. Correct: `UPDATE books SET Price = 200 WHERE BookID = 1;` HA · 3

MARKING SCHEME

✓ Line 4: the comma after the last column removed.
✓ Line 6: Muna Madan put in single quotes, `'Muna Madan'`.
✓ Line 7: `WHERE BookID = 1` added, since without it every book's price changes.

8 Write SQL queries

ANSWER A · 4

```
1  CREATE TABLE members (
2    MemberID INT PRIMARY KEY,
3    Name VARCHAR(50) NOT NULL,
4    Class INT,
5    Phone VARCHAR(10)
6  );
7  INSERT INTO members VALUES (1, 'Sita Rai', 10, '9841000001');
8  SELECT Name FROM members WHERE Class = 10 ORDER BY Name;
9  DELETE FROM members WHERE MemberID = 2;
```

With Sita Rai and two more members, Hari Bista (2, Class 9) and Gita Magar (3, Class 10), query iii shows:

Name
Gita Magar
Sita Rai

Also right: `CHAR(10)` for the phone; naming the columns in the INSERT; `CHECK (Class BETWEEN 1 AND 12)` or `UNIQUE` on Phone as extra rules.

MARKING SCHEME

✓ i. CREATE TABLE members with the four fields and suitable types, MemberID PRIMARY KEY and Name NOT NULL.
✓ ii. INSERT INTO members with the four values, the name and the phone in quotes.
✓ iii. SELECT Name FROM members WHERE Class = 10 ORDER BY Name.
✓ iv. DELETE FROM members WHERE MemberID = 2.

9 Long answer

ANSWER U · 4

A **database management system** (DBMS) is software used to create a database and to store, retrieve, update, delete and protect its data in an organized way; examples are MySQL, Oracle Database and SQLite. Its advantages:

1. Any data is stored easily and found in a moment with a query.
2. Each fact is stored once and linked, so redundancy is reduced.
3. Constraints refuse wrong data, so the data stays consistent and accurate.
4. Many users can work on the same data at once; each gets only the access they need; data can be backed up and recovered.

MARKING SCHEME

✓ A correct definition: software that creates and manages a database (stores, retrieves, changes and protects its data), with an example.
✓ Any one advantage, e.g. quick storage and retrieval with queries.
✓ A second advantage, e.g. less redundancy, or consistent and accurate data through constraints.
✓ A third advantage, e.g. sharing among many users, security, or backup and recovery.

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10 Think

ANSWER HA · 2

A column holds one value in each row, so a student's row could point to only one course; adding columns course1, course2… would leave empty or missing places. Instead a third table, a **junction table** (such as Enrollments or StudentCourses), has one row for each student taking each course, with two foreign keys: the student's ID and the course's ID.

MARKING SCHEME

- ✓ One foreign key holds one value per row, so each student could be linked to only one course (it is many-to-many).
- ✓ A junction table with two foreign keys, one row for each student–course pair.

11 Activity: Queries on a real database

(not marked)

WHAT STUDENTS SHOULD FIND

On the playground's students table (twelve students): `SELECT * FROM students WHERE Class = 9;` gives 6 rows; `WHERE Address = 'Thimi'` gives 2 (Binay Adhikari, Sabin Chapagain); `WHERE Name LIKE 'A%'` gives 4 (Aashish Shah, Ashna Rimal, Avinash Thapa, Aman Gurung); `WHERE Class = 10 AND Address = 'Banepa'` gives 2 (Nabin Dahal, Muna Tamang). Text in the WHERE goes in single quotes.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	10	11	12	5	**38**

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