

APOLLO

A3 Databases

HL

Computer Science

First assessment 2027

1 questions | mark schemes

3. (a) Award [3] max

Award [1] for SELECT DISTINCT or GROUP BY

Award [1] for using LIKE

Award [1] for using the wildcard (any wildcard accepted) and therapy

```
SELECT DISTINCT PatientName FROM VISITS
WHERE Treatment LIKE '%therapy%';
```

Alternative solution using group by:

```
SELECT PatientName FROM VISITS
WHERE Treatment LIKE '%therapy%'
GROUP BY PatientName
```

Alternative solution using a subquery and group by:

```
SELECT PatientName
FROM (
    SELECT PatientName
    FROM VISITS
    WHERE Treatment LIKE '%therapy%'
) AS subquery
GROUP BY PatientName;
```

(b) Award [5] max

Award [1] for the PATIENT table with correct Primary Key

Award [1] for the DOCTOR table with correct Primary Key

Award [1] for PatID foreign key in the VISIT table

Award [1] for DocID foreign key in the VISIT table

Award [1] for VisitID or PatID/DocID/VisitDate composite key in the VISIT table

```
PATIENT(PatID, PatientName, PatientDOB)
DOCTOR(DocID, Doctor)
VISIT(VisitID, PatID, DocID, VistDate, Treatment)
```

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(c) *Award [3] max*

Award [1] per point

Atomicity assures that a transaction is treated as a single, indivisible unit;

A transaction must either be fully completed on all nodes or not at all;

Transaction failure on one node triggers a rollback of the entire transaction across all nodes;

A commit will make sure that the updates which happened on one node because of the transaction are persisted in all nodes.

(d) *Award [3] max*

Award [1] per point

Spatial DBs are designed to store geographic data such as addresses;

Spatial DBs can be queried to identify clusters of virus patients;

Spatial DBs can create visual representations (maps) to see patterns;

Spatial DBs can support advanced spatial analysis, calculating distances between patient addresses and hospitals or identifying the cause e.g. nearby research lab;

Enables resource allocation (medical teams can be dispatched to the region);

Stored address data enables location-based contact tracing/highlights the area to quarantine/notify neighbours of the outbreak;