NGEE ANN
P O L Y T E C H N I C

Databases
Year 1 Semester 2

SCHOOL OF INFOCOMM TECHNOLOGY
Diploma in Information Technology
Diploma in Data Science
Diploma in Cybersecurity & Digital Forensics

ER Modelling Exercise
(10% of Module Assessment)

Practice Paper

INSTRUCTIONS TO CANDIDATES:

1. Write your Student Number, Name, Module Group and Seat Number <u>CLEARLY</u> in the boxes provided above.

2. This paper consists of **5** pages including this cover page. Check carefully to make sure your set is complete.

3. Answer **ALL** questions in the spaces provided.

4. **DO NOT** detach any pages from this booklet.

5. This is an open book test. **NO** electronic devices and programmable calculators are permitted.

Grade	

QUESTION 1: 70 marks

RenoVa is a renovation company that prides itself in providing innovative and corrective solutions to its customers in breathing life into new and ageing buildings.

The company now has a team of salesmen and evaluators among others. They do not play overlapping roles. Information of the company staff includes the unique identifier, name, date of birth, gender, educational qualifications.
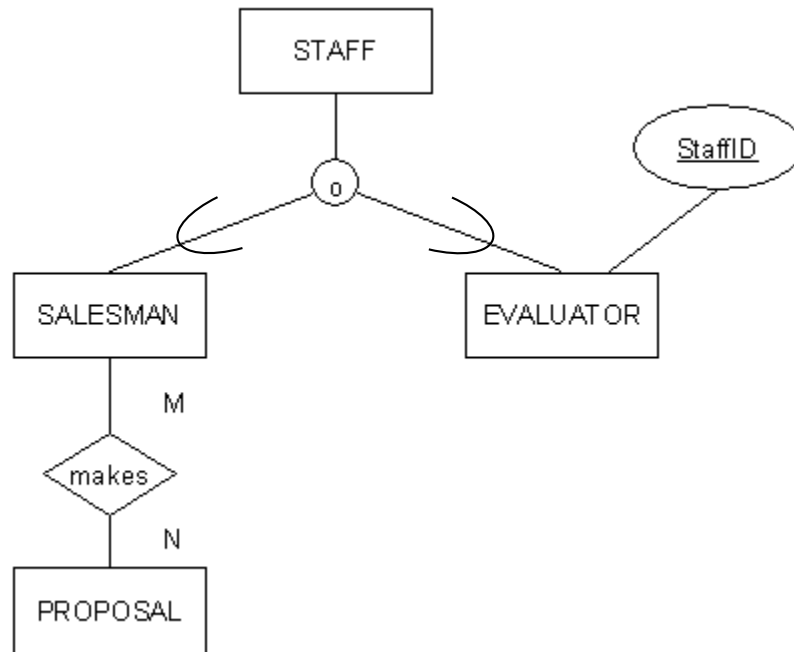
Salesmen will make proposals to clients who want to either repair or renovate their homes. Each proposal is undertaken by only one salesman. Information of it will include the unique identifier and date of the proposal. Each proposal is then being submitted to one of the company's evaluators who will examine it for its profitability. Upon approval, a job will then be negotiated and confirmed for the client of each proposal. The job will have a unique identifier, date of the job and completion date. Tasks are identified for the job. Each task will include a description, the cost, start and end dates. It will also be given a serial number unique only within the job. Not all proposals are converted to jobs.

The job is then tendered to an external contractor. Information kept of this contractor includes a unique identifier, name and contact person.

Information about clients includes a unique identifier for each client, his name and address.
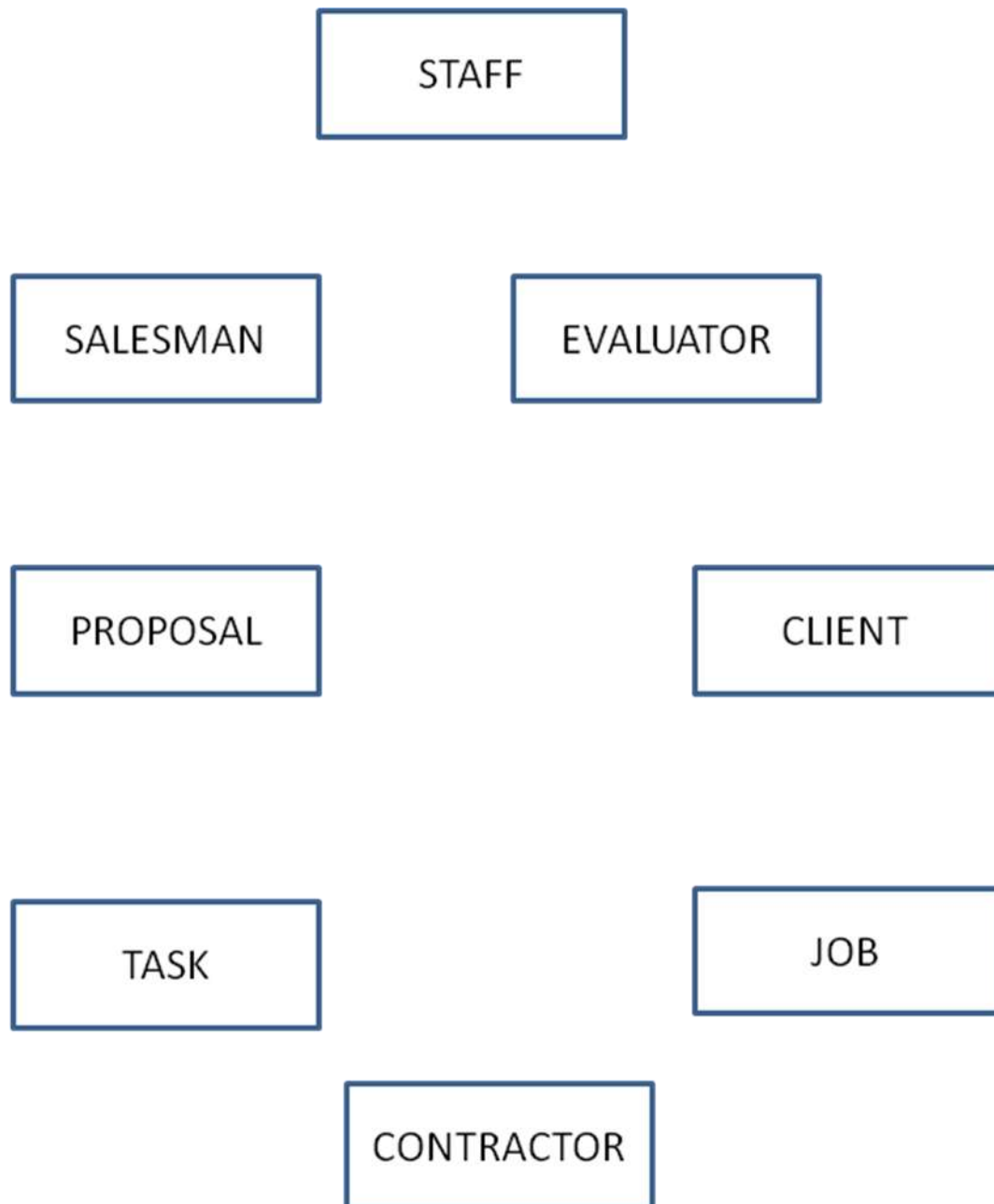
a) The diagram below shows a partial ER model of the case above. There are three errors in the diagram. (Ignore all other primary keys, attributes and relationship not shown in the diagram). Identify and explain why they are errors. Hence correct them by redrawing the model.

(20 marks)

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b) Complete the ER model by drawing in the missing relationship (cardinality ratio, participation type), primary and partial keys and attributes.

Figure 1-1 ER Diagram for Question 1 (b)

STAFF

SALESMAN

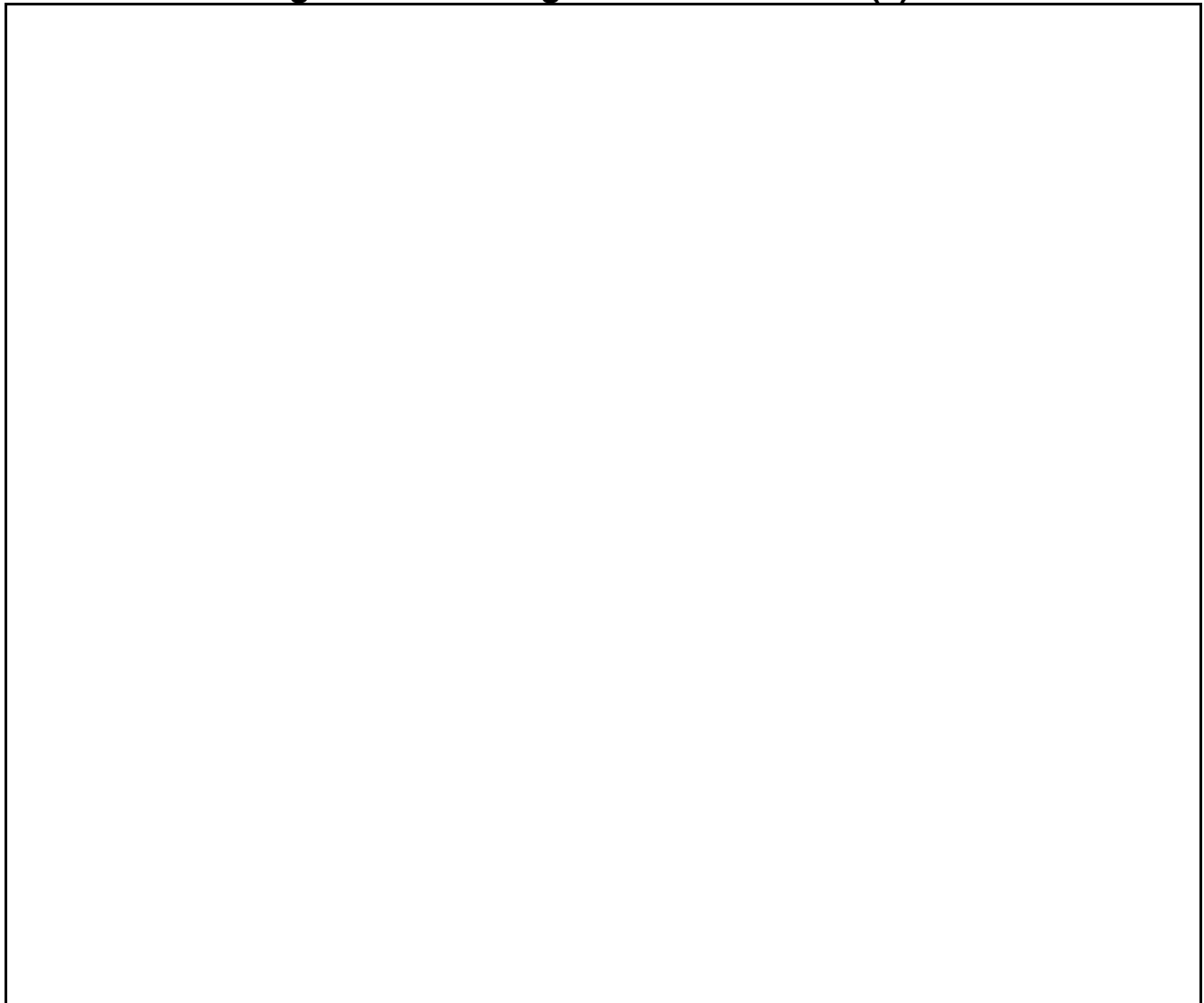EVALUATOR

PROPOSAL

CLIENT

TASK

JOB

CONTRACTOR

(30 marks)

c) If instead of the job being carried out totally by one contractor, it will be given to different contractors to work on different tasks of the job and a staff within the company is being appointed as project manager to supervise the job. This change will involve CONTRACTOR, JOB, TASK, and one more new entity, PROJECT MANAGER.

On a **separate diagram (**in the space provided **Figure 1-2**), draw an ER model to show the:
- any new entity/entities and attributes you identify
- all primary keys, including new ones, if identified
- the relationship(s) between the new entity/entities and the existing entity/entities affected, including the cardinality ratios and the participation constraints.
- You may leave out the non-key attributes of the existing entities tha tare affected.

(20 marks)

Figure 1-2 ER Diagram for Question 1 (c)

---- END OF PAPER ----