



CONFIDENTIALITY AGREEMENT – STUDENT

Unit Name: DATABASE SYSTEMS

Unit Number: ISYS1001/ISYS5008

Date & Time of Examination: Thursday September 16th, 2021, 10:00am – 11:30am

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Student Number: 20169321

Student Lab Group: TUESDAY, 12:00 PM

Student Signature: TC

**Question 1 ER Diagrams****[30 Marks]**Part 1**[6 Marks]**

Complete Part 1 Answer in the table below

Entity Sets	Keys	Other Attributes
Tour	name, duration	destination, cost, startingPlace
Attraction	attractionName, regionName	ticketPrice
Category	attractionName	category
Region	regionName	
Tourist	contactNumber	name, address, birthDate, age



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Part 2

[6 Marks]

Complete Part 2 Answer in the table below.

Relationship sets	Between which entity sets	Attributes of relationship set if any
Books	Tourist, Tour	date, time
Covers	Tour, Attraction	
Falls-under	Attraction, Category	
Managed-by	Tour, Region	



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Part 3

[6 Marks]

Complete Part 3 Answer in the two tables below.

Relationship sets	Cardinality Constraints
Books	Many-many
Covers	Many-many
Falls-under	Many-many
Managed-by	One-many

Relationship sets	Participation Constraints
Books	Tourist-total, Tour-partial (Tourists may book one or many tours; Tours may not be booked by any tourist)
Covers	Tour-total, Attraction-partial (Tours may cover one or more attractions; Attractions may not be covered by any tour)
Falls-under	Attraction-total, Category-partial (Attractions may fall under one or more categories; Categories may not have any attraction falling under it)
Managed-by	Tour-total, Region-partial (A Tour is managed by one region; A region may not manage any tours)



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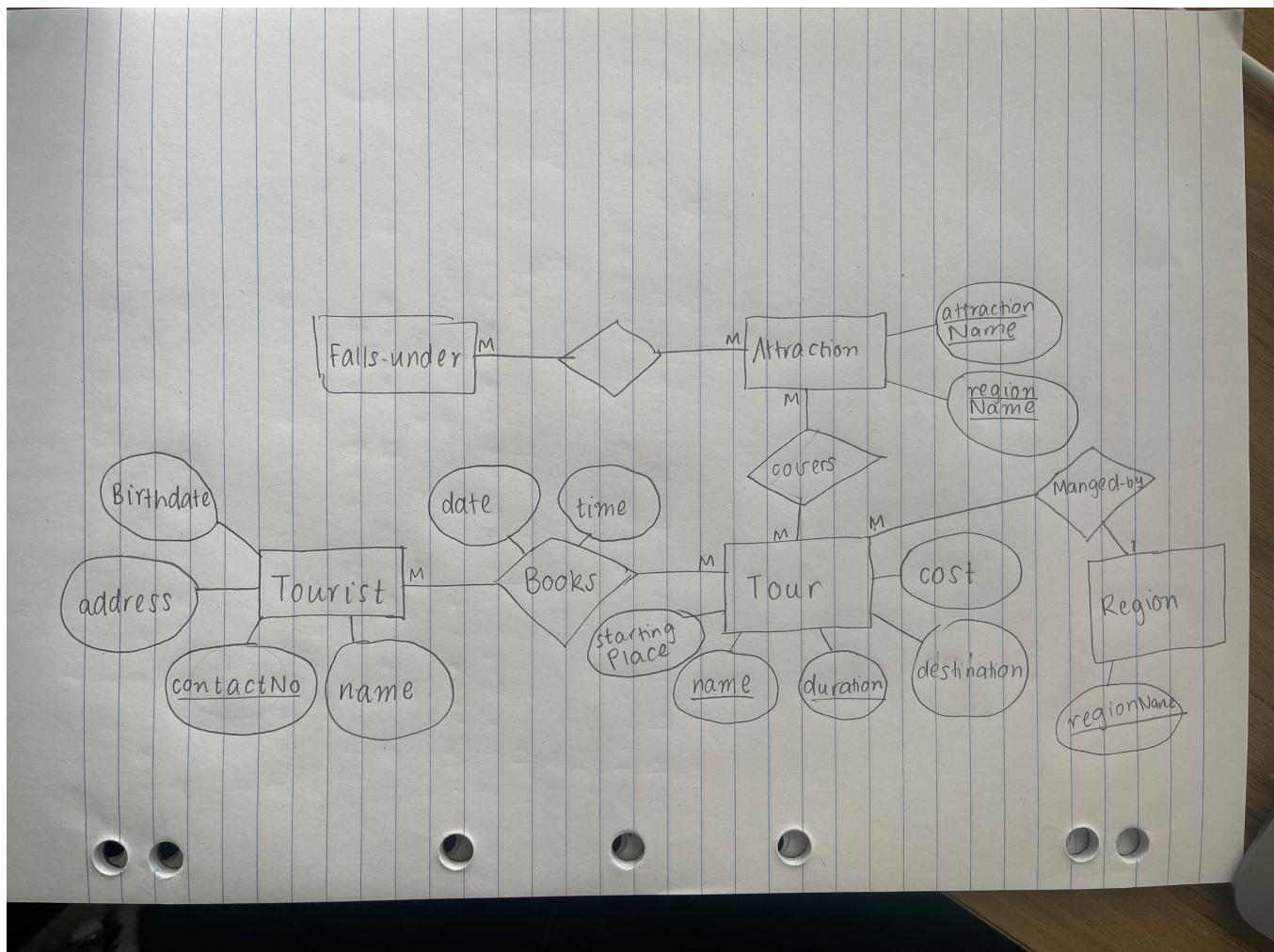
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Part 4

[12 Marks]

Please insert the diagram in the space provided below.





Indicate your assumptions and any other relevant information leads to design decisions below.

There is no need to have a separate ChildTourist entity set as every non-applicable field can be made null. Same with an AdultTourist, as every non-applicable field can be made null. There are not too many attributes to be concerned with so this solution is viable here.



Question 2 ER-Relational Mapping

[20 Marks]

Please provide answer in the space provided below.

Singer(singerNo (partial key), birthDate, name, telephone, teamName (foreign key))
Team(name, tagLine, city, singerName (foreign key), trainerName (foreign key))
Competes(day, venue, time)
Competition(season, year, title)
Trainer(trainerName, teamName (foreign key))
Performance(duration, pname, song)



Question 3 Normalisation

[15 Marks]

Part 1

[3 Marks]

Please provide answer in the space provided below

- The number of beds is an attribute of the patient, it should be an attribute of the ward
- A patient can have many illnesses but illness is listed as an attribute for the patient. There should be a separate entity set linking pid to illness
- mainDr is the name of the chief doctor of the ward, not the mainDr of the patient themselves.

Part 2

[12 Marks]

Please provide answers in space provided below. If you create any diagrams, please insert as an image (please ensure all diagrams are legible).

a)

No since a patient can have multiple illnesses but illness is listed as a field on the Patient. Therefore, it's likely that it is a list of multiple illnesses. The proposed decomposition is as follows:

Patient(pid, DOB, name, address, cward, mainDr, noBeds)
Illness(pid, illnessName)



b)

Yes, as there are no *relations* with composite primary keys. Illness is merely used to query information from other sets and doesn't store any information of its own

c)

Yes, as there is no set of attributes which transitively depend on one another (i.e., $a \rightarrow b$ and $b \rightarrow c$).



Please add any workings of the question 3 below

**Question 4****[15 Marks]**Part 1**[3 Mark]**

Please provide answer in the space provided below

It is a key which consists of two or more attributes that together uniquely identify an entity. For example
Consider the entity set
Employee(name, number, dept, salary)

Part 2**[3 Marks]**

Please provide answer in space provided below

A super key is a set of attributes that uniquely identifies each tuple of a relation. Whereas, a key is a super key with the property that removing any attributes from the key will result in the key condition not being satisfied.

Part 3**[3 Marks]**

Please provide answer in space provided below



Part 4

[6 Marks]

Please provide answer in space provided below

Please add any other workings for question 4 here

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Question 5

Part 1

[9 Marks]

Please provide answer in spaces provided below

a)

The purpose would be to display the name, full address and registration year of all students enrolled in engineering courses in WA

b)

Ivana Brown | 77, William Street, Woodland. | 2019

c)

INSERT INTO Students VALUES ('20169321', 'Tanaka Chitete', '72', 'Clontarf Lane', 'Bentley', 'WA', 'BComp', 'Computer Science', 2020);



Part 2

[11 Marks]

Please provide answer in spaces provided below

a)

No, as Relation names are case-sensitive. Staff and staff are considered to be different, unlike keywords such as WHERE and where which evaluate to the same thing.

b)

Yes as using '>' and '<' in this query is equivalent to using BETWEEN



No, as INNER JOIN and LEFT OUTER JOIN result in different results. INNER JOIN returns the union of the venn diagram and LEFT OUTER JOIN returns the UNION and what is exclusively on the left side of the venn diagram.

Please add any other workings here

END OF ASSESSMENT



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