

UNIVERSITY OF FORT HARE
EAST LONDON AND ALICE CAMPUS

IFS223E/IFS221/IFS221E

EXAMINATION

June 2019

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<u>Time:</u>	3 HOURS	Marks: 100
<u>Subject:</u>	Databases	
<u>Lecturer</u>	Prof L Cilliers	
	Mr E Chindenga	
<u>Moderator</u>	Prof R Piderit	

This paper consists of 5 pages including the cover page.

GENERAL INSTRUCTIONS TO CANDIDATES

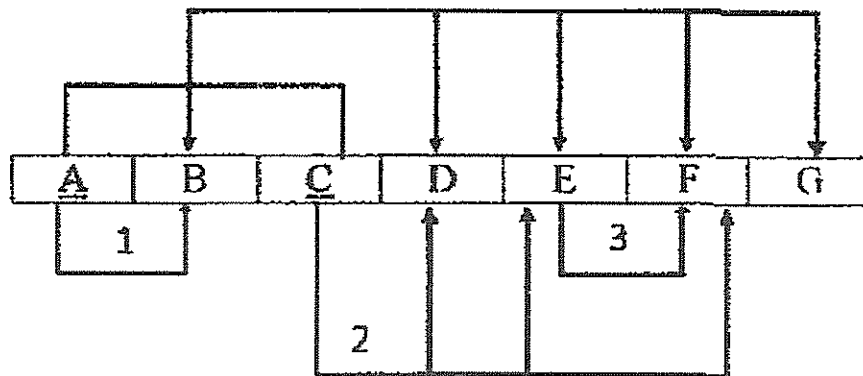
1. Answer **ALL** of the questions in Section A, B, C and D.
2. Time management is very important. The value of the marks for each question should be used as a rough guide to the amount of time allocated to answer the question.
3. It is in your interest to write legibly.

ANSWER ALL THE QUESTIONS IN THIS SECTION

1. The Database Lifecycle (DBLC) traces the history of a database system from its inception to its obsolescence. Identify the SIX phases of the DBLC. (6)
2. Making use of a table format, explain the differences between the FOUR levels of data abstraction? The headings of the table should include: model and focus. (4)
3. Identify the FOUR transaction properties that a good database should exhibit? (4)
4. Discuss what information the transaction log of a database should contain? (5)
5. Discuss the FIVE transparency features of a distributed database? (10)

The following questions are based on Diagram 1 below

DIAGRAM 1



6. Which dependencies are depicted by the following 3 relationships (respectively)? (1)
 - A → B (1)
 - C → D, E, F (2)
 - E → F (3)
 - A) Transitive dependency, transitive dependency and partial dependency
 - B) Transitive dependency, partial dependency and transitive dependency
 - C) Partial dependency, transitive dependency and partial dependency
 - D) Partial dependency, partial dependency and transitive dependency
7. Draw the dependency diagram for each table in the database. The tables should be at least in the 3NF. Indicate the primary keys and foreign keys (if any) for each table. (4)

Study the query provided below and answer the questions that follow:

```

1. create table City
2.
3. City_Code char(5) PRIMARY KEY,
4. City_Name char(20) NOT NULL,
5. City_Province varchar(30),
6. City_Country varchar(30);

7. Insert into city values ('CPT','Cape Town','Gauteng','ZA');
8. Insert into city values ('JNB','Johannesburg','Gauteng','ZA');
9. Insert into city values ('BLM','Bloemfontein','Orange Free
State','ZA')
10.      Insert into city values ('ESL','East London','Eastern
Cape','ZA');
11.      Insert into city values ('PTA','Pretoria','Gauteng','ZA');

12.      CREATE UNIQUE INDEX classcity_index
13.      ON Classcity
14.      city_CODE, city_Name);

15.      DELETE FROM Customer WHERE CityCode = BLM ;

16.      select * from classCity where City_name = 'East London' or
City_name = 'Bloemfontein';

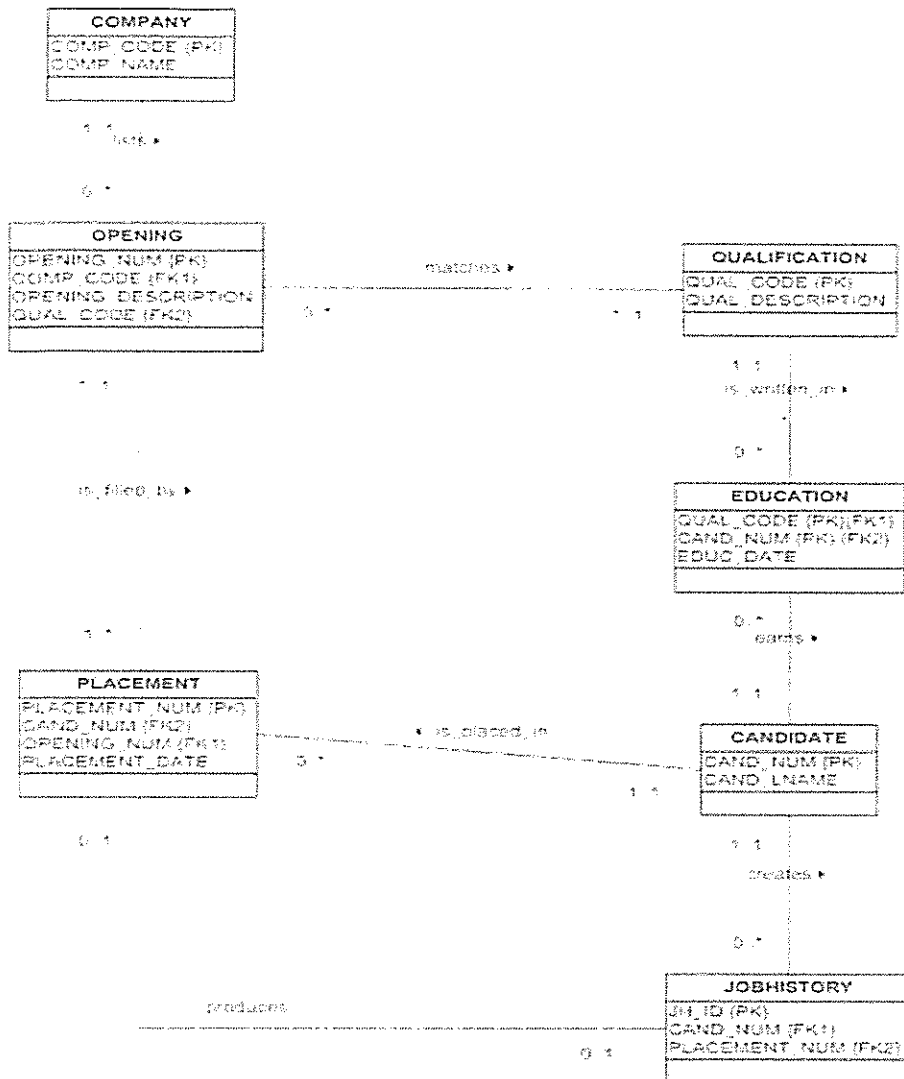
17.      select * from classCity where City_name = 'East London' and
City_name = 'Eloemfontein';

18.      SELECT COUNT (Distinct City_Code) FROM City;

```

8. Identify the constraint found in Lines 1-6 and provide an explanation for the purpose of this constraint? (2)
9. Identify the 2 data types found in Line 1-6 and provide a brief definition for each? (4)
10. In line 8, instead of entering 'Western Cape', the province was (incorrectly) captured as 'Gauteng'. How would you solve this problem? (3)
11. Identify the three mistakes that were made in the SQL statement found in Line 15? (3)
12. Write the SQL code to display the city name that start with the letter P? (3)
13. Explain how the results for the two queries in line 16-17 will differ? (2)
14. Explain the difference between 'count' and 'distinct' in line 18? (2)

The following questions are based on the diagram below.



15. Identify the business rules between the COMPANY and OPENING entities? (2)
16. Identify the primary key(s) of the EDUCATION entity? (2)
17. Identify FIVE of the characteristics of a good primary key? (5)
18. Discuss and provide an example of a multi-valued attribute in the diagram? (2)
19. Is CAND_LNAME an example of a simple or composite attribute? Motivate your answer (2)
20. What is the multiplicity between the CANDIDATE and JOBHISTORY entities? (1)
21. Identify the participation of the CANDIDATE and JOBHISTORY entities? (2)
22. Identify the cardinality of the PLACEMENT and JOBHISTORY entities? (2)
23. What is relationship degree of the CANDIDATE entity? (1)
24. What type of entity would you consider the EDUCATION entity to be? Justify your answer (3)

SECTION D – LONG QUESTIONS

(25)

25. Inmon & Kelley (1994) formulated 12 rules that define a data warehouse. Provide a discussion of what a data warehouse is, the architectural style of a data warehouse, the 12 rules that define a data warehouse and what data mining tools can be used in a data warehouse.

Your answer should include any relevant information that you think may be important.

Note that this question must be answered in a report format. The factual content will contribute 20 marks to the final mark, while the presentation of the report will contribute 5 marks. The report should make use of headings to familiarise the reader with the content. Answers in the form of bulleted lists, answers using incomplete sentences, and answers that are not divided into proper paragraphs will receive a low presentation score.

The end