NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOM CAMPUS

Requirements for this paper:/Benodigdhede vir hierdie vraestel				Resources/Hulpmiddels
Answer scripts:/ Antwoordskrifte	1	Multi-choice cards (A5):/ Multikeusekaarte (A5)		
Attendance slips (Fill-in paper):/ Presensiestrokies (Invulvraestel)		Multi-choice cards (A4):/ Multikeusekaarte (A4)		
Scrap paper:/ Rofwerkpapier	1	Graph paper:/ Grafiekpapier		

Type of Assessment/ Tipe Assessering:	**Exam 1st opportunity Eksamen 1e geleentheid Exam Paper/Vraestel 1**	**Qualification/ Kwalifikasie:**	**BSc in IT, BCom, BSc, BIng**
Module code/ Modulekode:	**ITRW321**	**Duration/ Tydsduur:**	**3 hour(s) uur/ure**
Module description/ Module beskrywing:	**Databasisse**	**Max/ Maks:**	**100**
Examiner(s)/ Eksaminator(e):	**ME L REDELINGHUYS**	**Date/ Datum:**	**28/10/2016**
		Time/ Tyd:	**9:00**
Moderator:	**DR E TAYLOR**		
Eksterne Moderator:	**DR T BEELDERS**		

Student name: ..... University number: .....

Examination Instructions

1. Students are not allowed to handle cell phones in the examination room and cell phone accessories including but not limited to earpieces, are not allowed.
2. Students bring bags to the venue at own risk, and must put them in front of the room.
3. Students may not wear caps / hats / beanies in the examination venue.
4. Students are subject to disciplinary procedures should they:
   4.1 have books or notes in their possession (except during open book examinations);
   4.2 attempt to assist another student, or attempt to obtain assistance.
5. Students are allowed into venue in the first half hour of session, but no extra time is granted.
6. No student is allowed to leave the examination venue before half an hour of the examination session has elapsed.
7. No refreshments are allowed in the examination venue.
8. No pages may be removed from the answer scripts.
9. Before students leave the examination venue, answer scripts must be handed to the invigilators.
10. The attendance slip on the back cover that also serves as an under-taking, must be completed.
11. All examination answers must be written in black or blue ink.

Eksamenvoorskrifte

1. Studente mag nie selfone in die eksamenlokaal hanteer nie en selfoontoebehore wat insluit maar nie tot oorfone beperk is nie, is nie toelaatbaar nie.
2. Studente bring sakke na lokaal op eie risiko, en moet dit voor in die lokaal neersit.
3. Studente mag nie pette / hoede / musse in die eksamenlokaal dra nie.
4. Studente stel hulle aan dissiplinêre optrede bloot indien hulle:
   4.1 enige boeke of notas by hulle sou hê (behalwe by oopboek-eksamens);
   4.2 'n ander student probeer help of probeer om hulp te kry.
5. Studente mag in eerste halfuur van sessie tot lokaal toegelaat word, maar geen ekstra tyd word toegestaan nie.
6. Geen student word toegelaat om die eksamenlokaal te verlaat binne die eerste halfuur van 'n eksamensessie nie.
7. Geen verversings word in 'n eksamenlokaal toegelaat nie.
8. Geen bladsye mag uit die antwoordskrif verwyder word nie.
9. Voordat studente die eksamenlokaal verlaat, moet die antwoordskrifte aan die toesighouers oorhandig word.
10. Die presensiestrokie op die agterblad wat ook as onderneming geld, moet voltooi word.
11. Studente moet slegs met swart of blou penne skryf.

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Afdeling A (Databasis beginsels) / *Division A (Database principles)* **[41]**

Vraag 1 (Transaksiebestuur, bestuur van gelyktydige gebruik en werkverrigting, verspreide databasisse) / *Question 1 (Transaction management, management of concurrent use and performance, distributed databases)* [20]

1.1 Noem en beskryf die eienskappe van transaksies. *Name and describe the properties of transactions.* (10)

1.2 Gee VIER algemene riglyne vir die skep en gebruik van indekse. *Give FOUR general guidelines for creating and using indexes.* (4)

1.3 Die akroniem KBP verteenwoordig drie wenslike eienskappe van 'n verspreide databasisomgewing *(CAP Theorem)*. Noem en bespreek hierdie eienskappe. *The acronym CAP represents three desirable properties of a distributed database environment (CAP Theorem). Name and discuss these properties.* (6)

Vraag 2 (Databasisse vir besluitneming ondersteuning) / *Question 2 (Databases for decision support)* [21]

2.1 Definieer 'n datapakhuis. *Define a data warehouse.* (6)

2.2 Teken 'n padkaart vir die ontwerp en implementering van 'n datapakhuis. *Draw a road map for the design and implementation of a data warehouse.* (5)

2.3 Wat is die verskil tussen data ontginning en voorspelbare ontleding (*predictive analytics*). *What is the difference between data mining and predictive analytics.* (2)

2.4 Noem VIER gebruike van data ontginningshulpmiddels. *Name FOUR uses of data mining tools.* (4)

2.5 Verduidelik wat 'n gematerialiseerde siening is. *Explain what a materialized view is.* (4)

Afdeling B (Oracle SQL) / *Division B (Oracle SQL)* **[59]**

Vraag 1 / *Question 1* [28]

Beskou die volgende tabelle wat in 'n operasionele databasis bestaan en beantwoord die vrae wat volg:
Consider the following tables existing in an operational database and answer the questions that follow:

SALESINFO *(EMPLOYEE_ID (PK), WEEK_ID (PK), SALES)*

SALES_SOURCE_DATA *(EMP_ID (PK), WEEK_ID (PK), SALES_MON, SALES_TUE, SALES_WED, SALES_THUR, SALES_FRI)*

EMPLOYEE *(EMP_ID (PK) ,EMP_TITLE, LNAME, FNAME, EMAIL, DOB, EMP_HIRE_DATE, EMP_SALARY, AREACODE, PHONE, EMP_MANAGER_ID)*

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1.1 Jy het per ongeluk die EMPLOYEE tabel verwyder met die DROP SQL stelling. Beskryf in detail wat jy sal doen om die tabel te herstel (terug te kry) sonder om 'n rugsteun terug te laai. Gee ook die SQL stellings om die tabel te herstel. *You have accidently dropped the EMPLOYEE table with the DROP SQL statement. Describe in detail what you will do to restore the table without restoring a backup. Also give the SQL statements to restore the table.* (5)

1.2 Verduidelik die ooreenkomste en verskille tussen die USER_OBJECTS, ALL_OBJECTS en DBA_OBJECTS sienings in die data woordeboek. *Explain the similarities and differences between the USER_OBJECTS, ALL_OBJECTS and DBA_OBJECTS views in the data dictionary.* (4)

1.3 Skryf 'n enkele SQL stelling om alle rekords in die **SALES_SOURCE_DATA** tabel te lees. Vir ELKE rekord in die **SALES_SOURCE_DATA** tabel moet vyf rekords geskryf word na die **SALES_INFO** tabel, d.i. een rekord vir elke dag se verkoopsyfers (sien onderstaande illustrasie). *Write a single SQL statement to read all records in the **SALES_SOURCE_DATA** table. For EVERY record in the **SALES_SOURCE_DATA** table, write five records to the **SALES_INFO** table, i.e. one record for each day's sales figures (see illustration below).*

(5)

Table SALES_SOURCE_DATA:

Emp_ID	Week_ID	MON	TUES	WED	THUR	FRI
176	6	2000	3000	4000	5000	6000

Table SALES_INFO:

Employee_ID	WEEK	SALES
176	6	2000
176	6	3000
176	6	4000
176	6	5000
176	6	6000

1.4 Skryf 'n SQL stelling om 'n datum te vertoon wat een jaar en vier maande na die aansteldatum (**EMP_HIRE_DATE**) van alle werknemers met bestuurder ID (**EMP_MANAGER_ID**) gelyk aan 210 op die **EMPLOYEE** tabel is. *Write a SQL statement to display a date that is one year and four months after the hire date (**EMP_HIRE_DATE**) of all employees with manager ID (**EMP_MANAGER_ID**) equal to 210 on the **EMPLOYEE** table.*

(4)

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1.5 Waarvoor word die **INTERVAL** data tipes gebruik? Verduidelik die intervalle wat deur die volgende SQL klousules aangedui word: *What are the **INTERVAL** data types used for? Explain the intervals indicated by the following SQL clauses:* (5)

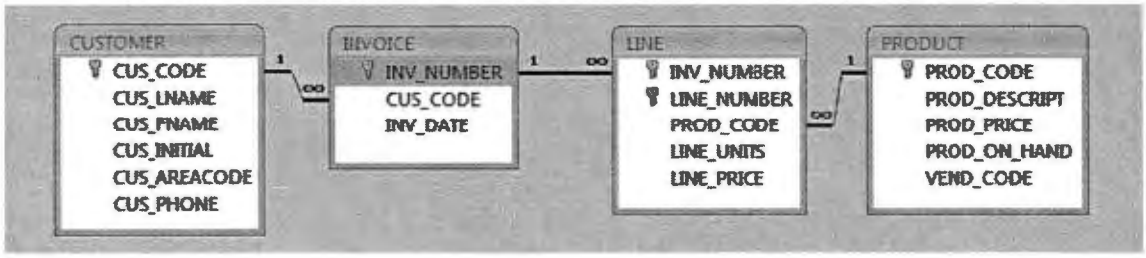
a. ***INTERVAL '111-9' YEAR(3) TO MONTH***

b. ***INTERVAL '999' MONTH(4)***

1.6 Definieer 'n eksterne tabel. Gee TWEE beperkings van eksterne tabelle. *Define an external table. Give TWO limitations of external tables.* (5)

Vraag 2 / *Question 2* [31]

Beskou die relasionele diagram vir 'n operasionele databasis van 'n fakturering stelsel onder en beantwoord die volgende vrae: *Consider the relational diagram for an operational database of an invoicing system below and answer the following questions*:



2.1 Jy moet 'n databasis skep vir 'n besluitnemings ondersteuning stelsel (BOS). Tydens onderhoude met gebruikers word die aantal fakture en die totale faktuurbedrag (LINE_UNITS * LINE_PRICE) per kliënt (CUSTOMER) per jaar en per maand (jaar en maand van INV_DATE) as inligtingsbehoeftes geïdentifiseer. Teken 'n gedetailleerde ster skema vir hierdie inligtingsbehoeftes. Dui alle primêre sleutels aan. *You must create a database for a decision support system (DSS). During interviews with users the number of invoices and the total invoice amount (LINE_UNITS * LINE_PRICE) per customer per year and per month (year and month of INV_DATE) were identified as information requirements. Draw a detailed star schema for these information requirements. Indicate all primary keys.*

(7)

2.2 Skryf 'n transaksie met SQL stellings om die feite tabel van jou ster skema te populeer met ALLE data uit die fakturering stelsel se operasionele databasis. Neem aan die feite tabel **INVOICE_FACT** is reeds geskep. *Write a transaction with SQL statements to populate the fact table of your star schema with ALL data from the invoicing system operational database. Assume the fact table* **INVOICE_FACT** *is already created.* (18)

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2.3 Watter indeks(e) behoort geskep te word om die spoed van die transaksie in 2.2 te verbeter? Neem aan daar bestaan reeds primêre en vreemde sleutels op die tabelle. *What index(es) should be created to improve the performance of the transaction in 2.2? Assume primary and foreign keys already exist on the tables.* (2)

2.4 Skryf 'n SQL stelling om vir die rol ***MANAGER*** toegang te gee tot die ***INVOICE_FACT*** tabel met die voorregte om navrae te doen. Die ***MANAGER*** rol moet ook hierdie voorregte vir ander gebruikers kan gee. *Write a SQL statement to give the role **MANAGER** access to the **INVOICE_FACT** table with privileges to query the table. The **MANAGER** role must also be able to give these privileges to other users.*

(4)

TOTAAL/TOTAL: 100

File reference: 8.1.7.2.2

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