NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
VAALDRIEHOEKKAMPUS

EKSAMEN / EXAMINATION:	**Tweede Geleentheid / Second Opportunity June 2016**	**KWALIFIKASIE / QUALIFICATION:**	**B.Sc.(IT)**
MODULEKODE / MODULE CODE:	**ITRW213**	**DUUR / DURATION:**	**3 Ure / Hours**
MODULE BESKRYWING / SUBJECT:	**Systems Analysis & Design I / Stelselontleding & -ontwerp I**	**MAKS / MAX:**	**100**
EKSAMINATOR(E) / EXAMINER(S):	**Imelda Smit**	**DATUM / DATE:**	**01/07/2016**
MODERATOR(E) / MODERATOR(S):	**Prof Roelien Goede**	**TYD / TIME:**	**14:00**

Answer all the questions. ★ *Beantwoord al die vrae.*

QUESTION / VRAAG 1 [CONTEXT | KONTEKS] [18]

1.1 Use your group project as reference. Explain the roles of the members acting as analyst(s), designer(s) and builder(s).	9	1.1 Gebruik jou groepprojek as verwysing. Verduidelik die rolle van die lede wat as ontleder(s), ontwerper(s) en programmeur(s) optree.
1.2 Discuss THREE business drivers that are important for your group project.	3	1.2 Bespreek DRIE sake-aanwysers wat belangrik is in jou groepprojek.
1.3 Compile a strategy for managing planned and unplanned systems development projects in a company to ensure transparency and promote the distribution of information.	6	1.3 Stel 'n strategie saam vir die bestuur van beplande en onbeplande stelselontwikkelingsprojekte in 'n maatskappy om deursigtigheid te verseker en die verspreiding van inligting te verseker.

QUESTION / VRAAG 2 [PROJECT MANAGEMENT | PROJEKBESTUUR] [17]

Study project X, with the following tasks (activities), its predecessors and lengths:

Bestudeer projek X, met die volgende take (aktiwiteite), hul voorgangers en lengtes:

Tasks	Duration (day)	Predecessors
A	1	None
B	2	None
C	3	None
D	4	A
E	5	B
F	4	B
G	6	C
H	6	D, E
I	2	G
J	3	F, H, I
Wed 3 August 2016 – municipal elections Mon 8 August – school holiday Tue 9 August 2016 – women's day		

2.1 Draw an activity-on-arrow PERT chart for project X.	5	2.1 Teken 'n aktiwiteit-op-pyl PERT-kaart vir projek X.
2.2 Indicate all the paths that occur on the network diagram.	2	2.2 Dui al die paaie wat voorkom op die netwerkdiagram aan.
2.3 Which one is the critical path? Why?	1	2.3 Watter een is die kritiese pad? Hoekom?
2.4 Which tasks have slack time? How much slack?	4	2.4 Watter take het speling? Hoeveel speling?
2.5 Draw a Gantt chart of project X. Use forward scheduling and start on 01 August 2016.	5	2.5 Teken 'n Gantt-kaart van projek X. Gebruik voorwaardse skedulering en begin op 01 Augustus 2016.

Question | Vraag 3 [FACT-FINDING | FEIT-INSAMELING] [20]

Study the following copy of the transcript of an interview between Mr. Peter Charles, President, and Anna Kelly, Web Programmer. This was the initial discussion concerning a proposed client technology tracking system.

Bestudeer die volgende kopie van 'n getranskribeerde onderhoud tussen Mnr Peter Charles, President, en Anna Kelly, Webprogrammeur. Dit was die aanvanklike bespreking aangaande 'n voorgestelde kliënte-tegnologienaspeuringstelsel.

Scene: *The office of Peter Charles, president of Coastline Systems Consulting. Peter is working at his desk. Anna Kelly knocks on the open door.*

Anna: Hey, Boss, do you have a few minutes?

Peter: The door is always open, Anna. Have a seat. What's on your mind?

Anna: I have an idea I'd like to bounce off you. I was talking to Ben the other day. He told me about going out to Fox Motors to check out a problem with their router. When he got there he discovered that the router password he had in his files wasn't right. He had to call back to our office to see if anyone knew what was going on. Turns out Jeff had replaced the router three months ago. Jeff had a record of its configuration, but Ben essentially wasted most of an hour learning what Jeff already knew.

Peter: Ouch. Sad to say, that isn't the first time something like that has happened.

Anna: Well, it got me thinking.

Peter: How so?

Anna: I've heard the other consultants tell similar stories. Someone goes out on a job and doesn't know what another consultant has already done. What if we build a company-wide database for storing that information?

Peter: I like that idea.

Anna: It would be really simple. It would need to keep all configuration information for every piece of equipment for every client. But that shouldn't be so hard.

Peter: Except that all those pieces of configuration information are different. Some are usernames and passwords. Some are IP addresses with or without port numbers. Some are web addresses where we go to setup databases or e-mail addresses or whatever else.

Anna: That just means we need to design the data carefully. I do databases for our web programming clients all the time.

Peter: There are a couple other pieces of the puzzle that maybe you haven't thought of since you don't often make field calls.

Anna: Like what?

Peter: Like hardware components. We sell and service computers. Sometimes the servicing gets confusing. Speaking as someone who has been known to crack open a case at a client's office, we need keep track of each piece of equipment (computers, printers, scanners, etc.) that we have in service. We need to know how each computer is configured in terms of RAM, hard drive, video card, etc. And we need to know when each component was purchased, because each has a different warranty period that we have to honour.

Anna: I thought we were keeping that information already.

Peter: We keep notes on that information for each client. But I can tell you that it doesn't work very well. As a result, Jeff and Ben sometimes get out on site and don't have the right equipment or drivers. Then they have to make a trip back here to get it. We don't bill clients for making an extra trip that shouldn't need to be made. If it is tourist season that can easily be a wasted hour that would normally be billed at $75. I bet every week either Jeff or Ben has a situation like that.

Anna: (*taking notes*) Hmmm. That increases the complexity of the system.

Peter: Yes, but we should build something that meets our needs. Also, components change over time. We might like to know what components were previously installed on each PC and when they were changed out.

Anna: Anything else the system should do?

Peter: Well, let's think about the example with Ben that you opened with. How did that service call originate? The client called in or e-mailed in with a problem. I'd like to build an Internet application off our home page that would allow clients to submit service requests. Then consultants could enter notes of their work on those requests.

Anna: If we had had that system, Ben might have known the router had been changed out before he got there.

Peter: Right. Plus on on-going problems, any consultant could access that history and know what not to do. In addition, this would probably save Kathy 5 hours a week in answering service request calls and trying to pass them on to technicians.

Anna: Having service requests on the Internet is a good idea. But we can't have the configuration and component information on the Internet, can we?

Peter: Heavens no. That would be a hacker's candy store. That part of the system will have to be secure. I don't want it exposed to the Internet at all with even the best security.

Anna: But then how will the consultants get at that information out in the field?

. . .

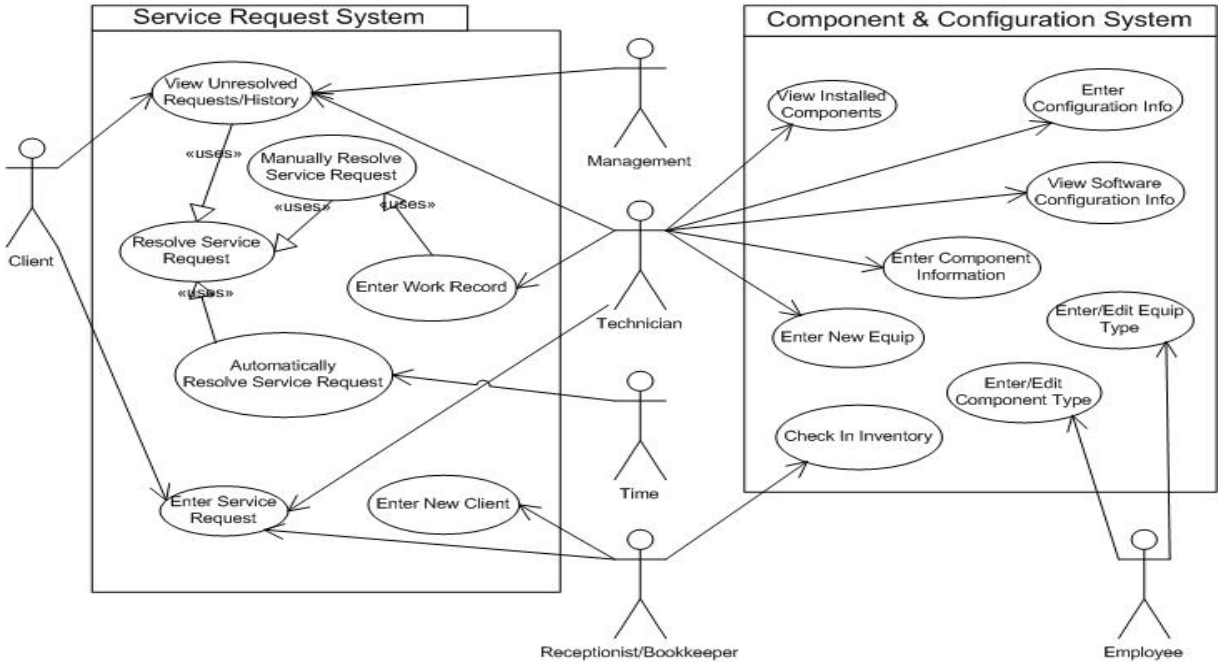
Peter:	Good question. We'll have to think about it. Maybe we can replicate the data to laptops when they go in the field.
Anna:	What about having our in-house network accessible through a VPN?
Peter:	That might be okay if our people were always on the Internet when they are in the field. But they aren't.
Anna:	Then data replication may be the only way.
Peter:	Don't rush to judgment. We'll investigate it.
Anna:	Well, suddenly this system has grown way beyond what I had envisioned.
Peter:	Systems have a way of doing that. That's why we design first and build second. Anna, I'd like to turn the design of this project over to you.
Anna:	Thank you. I was hoping you'd say that. I've already been thinking about how the data would look and some of the programming routines we would need.
Peter:	Don't jump into implementing it yet. Design first, build second.
Anna:	Sorry. I guess I'm excited. This will be the first full application I've designed and built from the ground up.
Peter:	Yes, and it will be a high profile system both to us and to our clients. This will help us keep our clients satisfied. It is hard to put a dollar figure on that without knowing more about what the current problems cost us in terms of lost or dissatisfied clients. But if we can make clients happier, it will surely payoff.
Anna:	Where do we start?
Peter:	The first step is to prepare a formal Request for System Services to request the investigation of a system development project. I'd also like you to do a Problem Statement Matrix.
Anna:	Do we have to do that even when we are requesting our own services? I mean this system is for our own use.
Peter:	Yes, we do. We have to justify our allocation of human resources to this project as opposed to projects than generate client billings. How long do you think it will take you to complete the project?
Anna:	I wouldn't know how to begin to estimate it.
Peter:	It comes with experience. But you have some experience already from working on your other projects. How does this one compare in terms of complexity of the data?
Anna:	My original ideas could have been implemented with a pretty simple data structure. The PC components and the request tracking make it more complex. I guess it is about twice as complex as the shopping cart application I wrote.
Peter:	So where does all that lead you in terms of a ballpark estimate?
Anna:	I'll say six months for now. But that is very rough. I would need to look at it more closely to be sure.
Peter:	Exactly. That is why we design first and build second. Use six months as your initial estimate. Then we'll see what the Problem Statement Matrix and the Request for System Services say before we start investing any serious time in this.
Anna:	OK. You're the boss, Boss. I'll get right on it.

3.1 As what type of interview would you classify the example? Motivate your answer.	2	3.1 As watter tipe onderhoud sal jy die voorbeeld klassifiseer? Motiveer jou antwoord.
3.2 Use the guidelines you studied to compile a document to guide Kelly regarding how well the interview was conducted. Give special attention to aspects she may improve on.	10	3.2 Gebruik die riglyne wat jy bestudeer het om 'n dokument saam te stel om Kelly te lei met betrekking tot hoe goed die onderhoud gevoer is. Gee spesiale aandag aan aspekte waarop sy kan verbeter.
3.3 No indication is given regarding Kelly's preparation for the interview. This may point to the fact that Kelly did not prepare (well) for the interview. Apply reverse engineering to compile an interview guide for this interview.	8	3.3 Geen aanduiding word gegee met betrekking tot Kelly se voorbereiding vir die onderhoud nie. Dit mag wys dat Kelly nie (goed) voorberei het vir die onderhoud nie. Pas omgekeerde ingenieurswese toe om 'n onderhoudgids vir die onderhoud saam te stel.

Question | Vraag 4 [USE CASE MODELLING | GEBRUIKSGEVALMODELLERING] [12]

Study the use-case diagram below:

Bestudeer die gebruiksgevaldiagram hieronder:

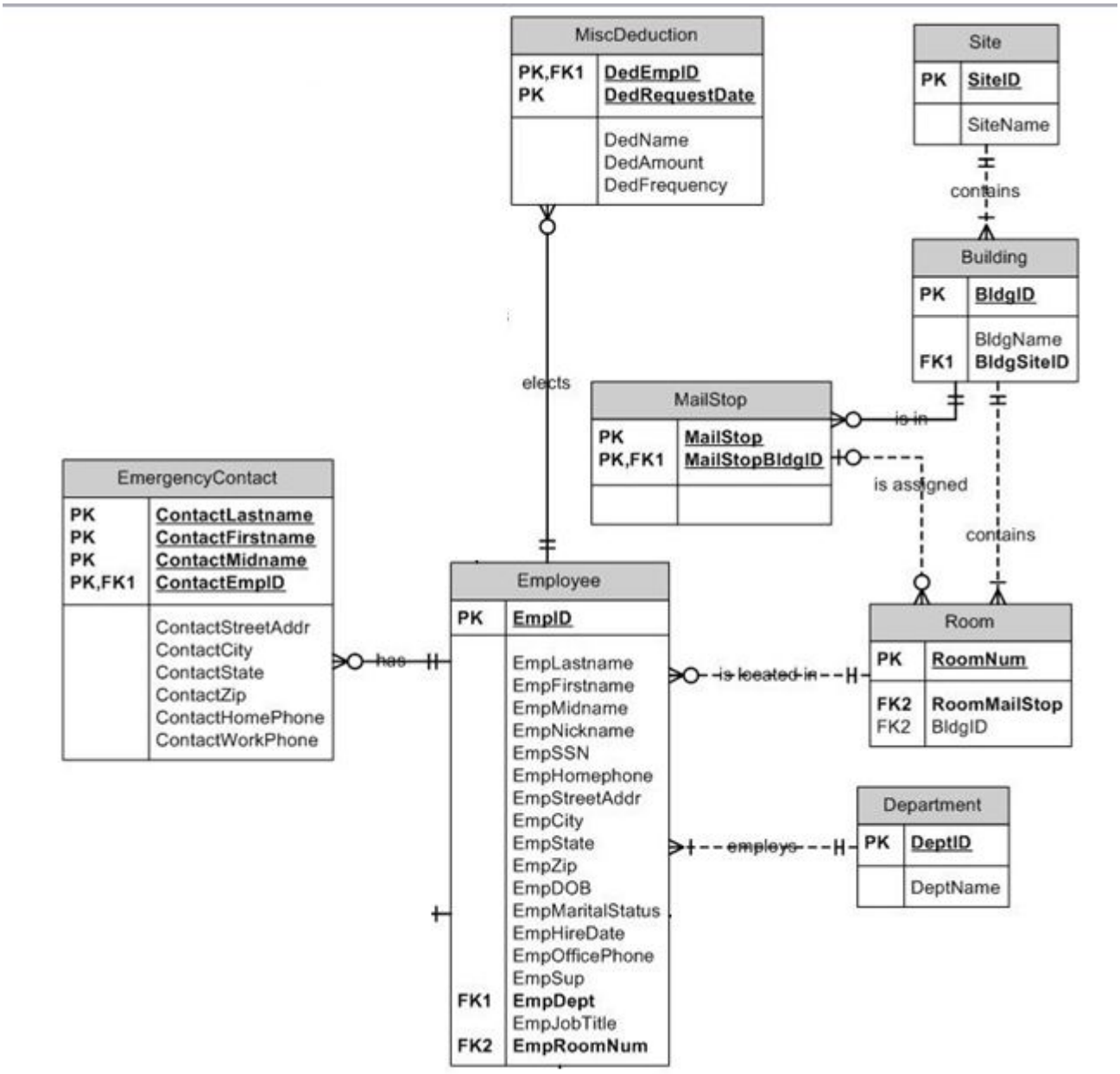


Use the use-case diagram given to draw a use-case dependency diagram.

Gebruik die gegewe gebruiksgevaldiagram om 'n gebruiksgevalafhanklikheidsdiagram te teken.

Question | Vraag 5 [DATA & PROCESS MODELLING | DATA & PROSES MODELLERING] [21]

Study the following ERD: Bestudeer die volgende EVD:

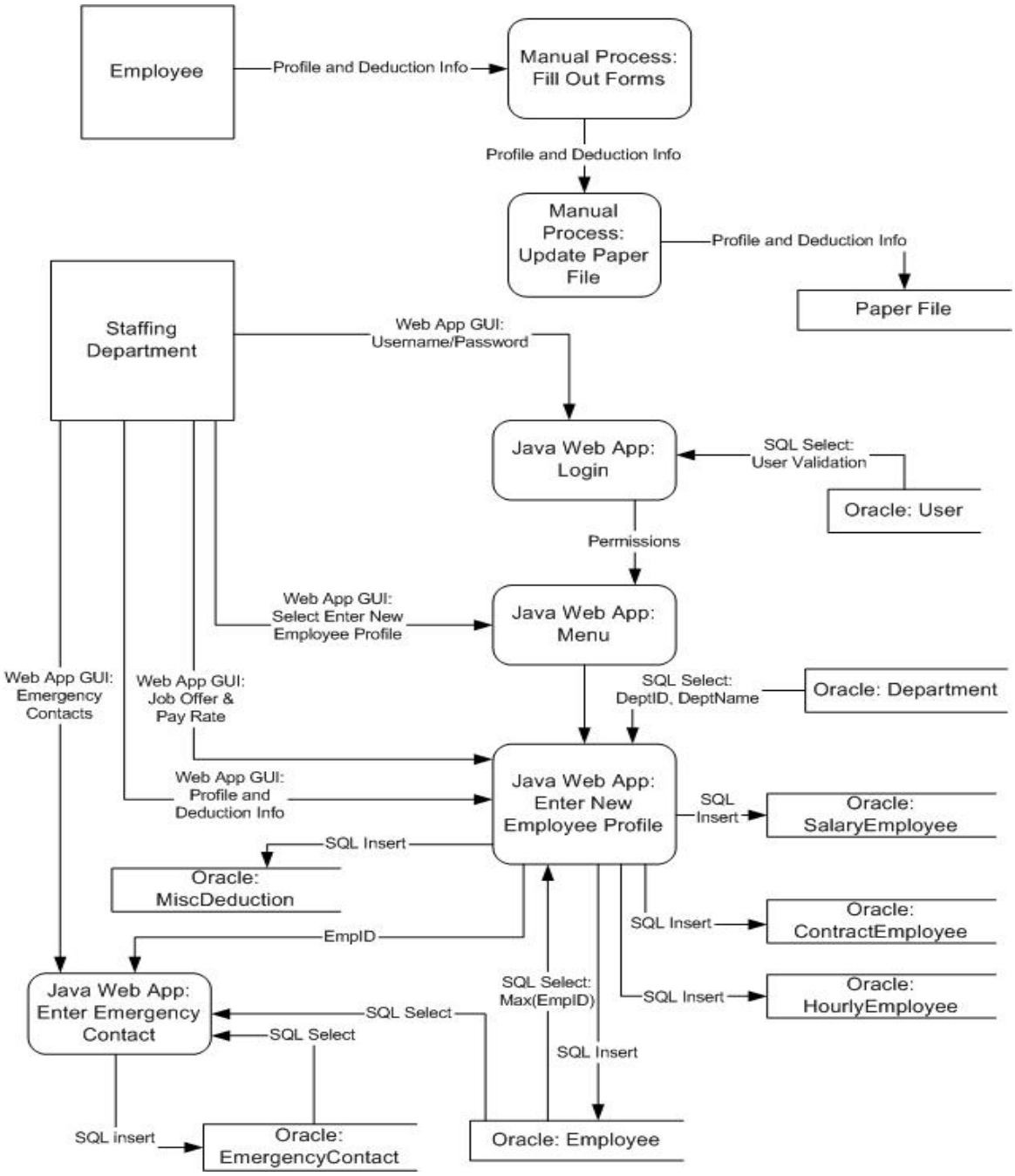


5.1 Use the 1NF-2NF-3NF definitions you studies to obtain a set of tables to be implemented. 9

5.1 Gebruik die 1NV-2NV-3NV definisies wat jy bestudeer het om 'n stel tabelle vir implementering te kry.

Study the following physical DFD:

Bestudeer die volgende fisiese DVD:



5.2 Use the ERD and DFD given to compile a data-to-process CRUD matrix. You only need to use THREE entities and FIVE processes.	12	5.2 Gebruik die EVD en DVD gegee om 'n data-tot-proses SLBS matriks saam te stel. Jy hoef slegs DRIE entiteite en VYF prosesse te gebruik.

QUESTION / VRAAG 6 [FEASIBILITY ANALYSIS & THE SYSTEM PROPOSAL | UITVOERBAARHEIDSONTLEDING & DIE STELSELVOORSTEL] [12]

6.1 Refer to your group project and evaluate its technical feasibility.	6	6.1 Verwys na jou groepprojek en evalueer die tegniese uitvoerbaarheid daarvan.
6.2 You studied THREE cost-benefit analysis techniques. Name and explain each. Compare the THREE techniques to show how each one will contribute to determine the value of a particular candidate solution.	6	6.2 Jy het DRIE kostevoordele-analisetegnieke bestudeer. Noem en verduidelik elkeen. Vergelyk die DRIE tegnieke om te wys hoe elkeen sal bydra om die waarde van 'n spesifieke kandidaatoplossing te bepaal.