MODULE NAME:	MODULE CODE:
SYSTEM ANALYSIS AND DESIGN	SAND6211

ASSESSMENT TYPE:	EXAMINATION (PAPER ONLY)
TOTAL MARK ALLOCATION:	120 MARKS
TOTAL HOURS:	2 HOURS (+10 minutes reading time)

INSTRUCTIONS:
1. Please adhere to all instructions in the assessment booklet.
2. Independent work is required.
3. Five minutes per hour of the assessment to a maximum of 15 minutes is dedicated to reading time before the start of the assessment. You may make notes on your question paper, but not in your answer sheet. Calculators may not be used during reading time.
4. You may not leave the assessment venue during reading time, or during the first hour or during the last 15 minutes of the assessment.
5. Ensure that your name is on all pieces of paper or books that you will be submitting. Submit all the pages of this assessment's question paper as well as your answer script.
6. Answer all the questions on the answer sheets or in answer booklets provided. The phrase 'END OF PAPER' will appear after the final set question of this assessment.
7. Remember to work at a steady pace so that you are able to complete the assessment within the allocated time. Use the mark allocation as a guideline as to how much time to spend on each section.

Additional instructions:
1. *This is a CLOSED BOOK assessment.*
2. *Calculators are allowed*
3. *This assessment has Six Sections . You are required to answer All of these sections*
4. *Answer All Questions.*
5. *Show all calculations, where applicable (marks may be awarded for this).*

Scenario

Creative Rugs designs custom rugs for the rich and famous. The company has grown so much that the existing consultants can no longer cope with all the customers and their orders. This has had a negative impact on the customer service provided by Creative Rugs. Orders are received by the consultants and a factory owned by Creative Rugs will then produce the rugs. It was suggested that an application be developed that would enable customers to design their own rugs and just send through the specifications of the rugs they want.

The owners of Creative Rugs have suggested the following process be followed by customers when ordering a rug:

To design a rug using the application, the customer would first download the application onto their computer and register to use it. In order to register, the customer would enter their name, surname, telephone number and shipping address. The customer would then be asked to specify the following in terms of the rug to be produced:

- The fabric to be used for the rug;

- The dimensions of the rug;

- The colour of the rug;

- The decorative image to appear on the rug.

- Quantity of rugs to be produced.

Once the rug's specifications have been entered into the application and the quantity to be produced specified, the customer will click on the finalize button on the application which would send the design to Creative Rugs. Staff at Creative Rugs would then send a quote to the customer via the application. Once the customer accepts the quote, the customer will be prompted for their credit card details. They payment will be processed by the staff at Creative Rugs. The factory will receive the rug's specifications as well as shipping information from the Creative Rugs staff, manufacture the rug and ship the rug to the customer- anywhere in the world, wherever they might find themselves.

It was made clear that there should be a help facility and that the main colour scheme for the application should be a deep red and white. If formal approval for the project is given, the application must be ready for deployment by 2 May 2017.

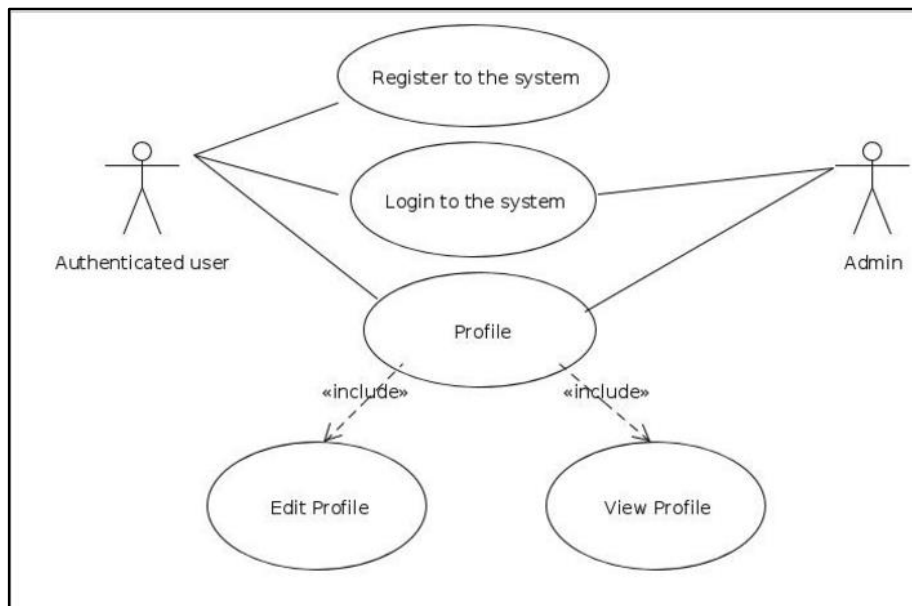| **Question 1**		**(Marks: 10)**
Answer the questions in this section based on the information contained in the scenario presented at the beginning of the paper.		
Q.1.1	Briefly explain why it can be said that the application to be developed for Creative Rugs is a computer application?	(3)
Q.1.2	Produce a System Vision Document for the Creative Rugs application to be developed. In your document, address the following components: Problem description, at least three (3) System capabilities and at least two (2) Business Benefits.	(7)

Question 2		**(Marks: 40)**
Answer all of the questions in this section. **Take Note:** Questions 2.1, 2.2, 2.3, 2.5 and 2.6 relate to the scenario presented at the beginning of the paper.		
Q.2.1	Identify two non-functional requirements from the scenario. Also identify the non-functional requirement category (FURPS) to which these requirements belong.	(3)
Q.2.2	From the scenario, identify one external stakeholder, one operational stakeholder and one executive stakeholder.	(3)
Q.2.3	Create an Activity diagram that will describe the activities involved in ordering and receiving a custom rug using the Creative Rugs application.	(17)

Q.2.4	Consider the diagram below, then answer the questions that follow:	
	Sample Resume of Example For Use Case Diagram. n.d. [image online]. Available at: gembyeng.goip.de/example-for-use-case-diagram.html [Accessed 4 October 2016].	
	Q.2.4.1 What is the diagram used for?	(1)
	Q.2.4.2 Identify two (2) actors from the diagram provided.	(2)
	Q.2.4.3 Identify two (2) use cases from the diagram provided.	(2)
	Q.2.4.4 Explain the use of the <<includes>> clause in the diagram.	(3)
Q.2.5	From the scenario about Creative Rugs, the class 'Customer' can be identified. Show the UML domain class symbol with name and attributes for this class.	(5)
Q.2.6	At Creative Rugs, an employee can either be a consultant or a factory worker. Show, by means of a diagram, how the relationship between the classes in the aforementioned sentence could be indicated. There is no need to indicate methods and behaviours for each class.	(4)

Question 3   (Marks: 5)

Match-the-columns question: Match the design activity in Column A with the correct key question asked during each activity from Column B. In your answer booklet, write down only the question number and, next to it, the letter of the correct answer.

	Column A		Column B
Q.3.1	Design the environment.	**1.**	Have we specified in detail all information storage requirements and schema elements?
Q.3.2	Design user interfaces.	**2.**	Have we specified in detail all the elements to ensure the system and the data are secure and protected?
Q.3.3	Design the database.	**3.**	Have we specified in detail how the system will communicate with all other systems?
Q.3.4	Design the system interfaces	**4.**	Have we specified in detail how support will be provided to the users?
Q.3.5	Design system controls and security.	**5.**	Have we specified in detail the environment in which the software will execute?
		6.	Have we specified in detail all software elements and how each use case is executed?
		7.	Have we specified in detail how users will interact with the system to carry out all their tasks?

Question 4		**(Marks: 10)**
Answer all of the questions in this section. Question 4.2 and 4.3 makes reference to the scenario presented at the beginning of this paper.		
Q.4.1	Distinguish between user-interface controls and system-interface controls?	(2)
Q.4.2	Assuming that a three-layer architecture will be used with the system to be developed for Creative Rugs, explain the three-layers by referring to the new system to be developed for Creative Rugs.	(6)
Q.4.3	When designing the user interface for the Creative Rugs application, the controls need to have good visibility and affordance. What will the impact be if visibility of controls is not good and affordance was not achieved?	(2)

Question 5	**(Marks: 15)**
This question makes reference to the scenario provided at the beginning of the paper.

Assuming that you will be following a traditional predictive approach to the SDLC when developing the application for Creative Rugs, illustrate by means of a diagram the activities you will perform in the development of the application. The activities need to make explicit reference to the development of the application. | |

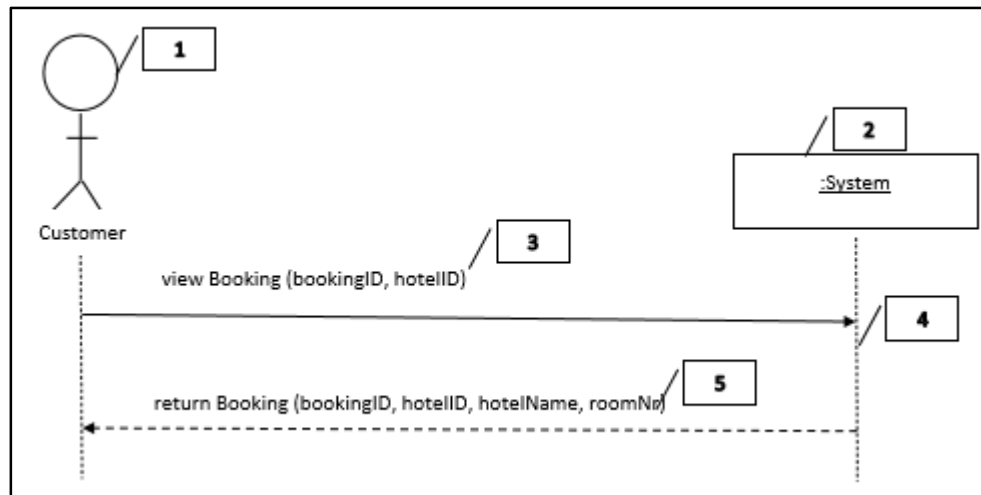| **Question 6**		**(Marks: 40)**
Answer all questions in this section. Question 6.2, 6.6, 6.7 and 6.8 makes reference to the scenario presented at the beginning of the paper.		
Q.6.1	Categorize each of the models below as either a Requirements model or a Design model: • Use case diagram • System sequence diagram • Component diagram • Deployment diagram • State machine diagram	(5)

Q.6.2	If Creative Rugs suddenly decide that they would like to, instead of an application that is downloaded by the customer, have the user log on to a web site and complete the registration and ordering process via the web site, would the system be considered a client-server network-based system or an Internet-based system? Motivate your answer.	(4)
Q.6.3	Consider the diagram below then identify the parts labelled one (1) to five (5).	(5)
Q.6.4	Consider the following table. Are there any functional dependencies present in the table? Motivate your answer.	(3)

CustomerID	CustomerName
8803165035089	John
7906150200053	Jill

Q.6.5	Consider the following table, then motivate whether the following table is in second normal form or not.	(3)

CustomerID	CustomerName
8803165035089	John
7906150200053	Jill
7708140600083	John

Q.6.6	Provide any two (2) examples of input controls which the developers of the application for Creative Rugs can implement during the development of the application. Also identify the type of input control for each example provided.	(4)

Q.6.7	Managers at Creative Rugs have access to all aspects and functionality associated with the ordering and processing of payments of rugs. One of the managers, however, has a serious gambling problem and is drowning in debt. How high of a risk of fraud does this scenario present? Motivate your answer.	(7)
Q.6.8	The application for Creative Rugs has been developed and is ready for deployment. Which approach to deployment will you follow? Motivate your answer. Also mention one (1) advantage and one (1) disadvantage of the approach.	(4)
Q.6.9	Briefly explain the difference between an alpha test version and a beta test version. Also state what the finished product will be called.	(5)

END OF PAPER