

**UNIVERSITY OF KWAZULU-NATAL**  
**SCHOOL OF AGRICULTURAL, EARTH AND ENVIRONMENTAL SCIENCES**  
**DISCIPLINE OF DIETETICS & HUMAN NUTRITION**  
**EXAMINATION: NOVEMBER 2013**  
**SUBJECT, COURSE & CODE: DIET 237 - P2**  
**WEIGHT, DIABETES, HEART DISEASE**

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**External Examiner: Dr K Pillay**  
**Internal Examiner: Mrs S Ogilvie**

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**DURATION: 3 HOURS**

**TOTAL MARKS: 150**

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**NOTE: THIS PAPER CONSISTS OF SEVEN (7) PAGES AND APPENDIX A THREE (3) PAGES AND APPENDIX B ONE (1) PAGE**  
**PLEASE CHECK THAT YOU HAVE THEM ALL.**  
**PLEASE WRITE LEGIBLY AND ANSWER ALL QUESTIONS IN INK. ANSWERS WRITTEN IN PENCIL WILL NOT BE MARKED**

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**QUESTION 1 IS COMPULSORY, YOU MAY ANSWER ANY TWO (2) OF THE OTHER THREE (3) QUESTIONS.**

**QUESTION 1 – COMPULSORY**

Mr Mann, a 69-year-old who has been diabetic for 23 years, has no family history of diabetes. At diagnosis he was put on Daonil which controlled his blood glucose initially. A few years later he was hospitalized as he was not feeling well and was weighing 57.5 kg, having lost 8 kg the previous 5 weeks. On admission his blood glucose reading was 32 mmol/L so he was started on Actrapid and Protaphane. Nine months later his weight had increased to 68 kg and his blood glucose was well controlled.

After many years on Actrapid and Protaphane he was changed to NovoRapid (8 units at breakfast, 10 units at lunch and 12 units at supper) and Levemir (20 units at 22h00) He and his wife usually eat out in a restaurant 2 to 3 times per week. He seldom has dessert, but usually has ½ bottle of wine with his meal.  
Over the years his weight has remained constant between 67 – 71 kg.

His diabetes is generally well controlled, but his HbA1c has been up to 9 % in the past. He has “highs” and “lows” which he can’t explain and asks for your help. He tests his blood glucose regularly before breakfast and before supper and occasionally at other times. He has been referred to you as his SBGM results are very erratic.

You get the following information from him.

Height	1.8 m
Weight	70.5 kg
HbA1c	6.8 %
Cholesterol	7.2 mmol/L
HDL	1.6 mmol/L
LDL	4.6 mmol/L
Blood pressure	150/100 mmHg

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His blood glucose readings (mmol/L) for the previous week are as follows:

	Before breakfast	Before supper	Comments
Monday	6.3	8.3	
Tuesday	5.4	16.3	Lunch out
Wednesday	6.1	6.8	Cake at 9 pm after meeting
Thursday	15.2	9.5	
Friday	7.2	1.8	Lunch out
Saturday	12.6	9.3	
Sunday	4.5	6.1	

- 1.1 Calculate and interpret his BMI. (1)
- 1.2 Calculate his present energy requirement using the Schofield equation and an activity factor of 35 %. (2)
- 1.3 Calculate his macronutrient prescription and carbohydrate distribution (in grams) for his current insulin therapy. (7)
- 1.4 How would you calculate his insulin dose when he first started on insulin? (4)
- 1.5 Explain what the HbA1c test is, why it is important and interpret his most recent result. (5)
- 1.6 Discuss why he initially lost weight rapidly before insulin was started. (4)
- 1.7 How would you classify his diabetes? Give reasons for your answer. (7)
- 1.8 Explain the differences as to classification and action between the initial insulin he was using and the insulin he is now using? (6)
- 1.9 Discuss with him the onset, peak and duration of action of his current insulin regime. (6)

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- 1.10 Looking at his SBGM results advise him on what measures (food and insulin), he should have taken to prevent blood glucose swings in respect of the following readings:-
- a) Tuesday before supper was high after having a pasta in creamy sauce for lunch. (2)
  - b) Thursday before breakfast was high after a slice of cake at 9 pm on Wednesday after a meeting. He enjoys the cake and is not prepared to cut it out. (1)
  - c) On Friday he went out to lunch and had a large cheese and mushroom omelet with a green salad. He gave himself 12 units of NovoRapid and was “hypo” before supper. (2)
  - d) On Saturday morning his blood glucose reading was 12.6 mmol/L. Give three possible reasons for the high reading. (3)

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**ANSWER ANY TWO (2) OF THE FOLLOWING THREE (3) QUESTIONS.**

**QUESTION 2**

Nerusha is a 42 year old wife and mother of 2 teenage boys. She was retrenched 3 years ago, and has been unable to find another job. She is inactive and does not enjoy exercise. One day whilst watching TV she sees an advert for life insurance, and decides to investigate further. The company offering Nerusha insurance asks her to go to her nearest Dischem store for an assessment, including blood tests.

A few weeks later she receives a letter from the insurance company saying that her request has been declined due to her poor health status, which they have indicated below.

Weight	92 kg
Height	156 cm
BMI	37.8 kg/m <sup>2</sup>
Waist circumference	91 cm
Waist to hip ratio	0.86
Fasting blood glucose	7 mmol/l
Blood pressure	145/98 mmHg
Triglycerides	2.1 mmol/l
HDL cholesterol	0.82 mmol/l

Nerusha is very disappointed by her weight. She is unsure what the rest of the information means, so asks her neighbour who is a dietitian (you) to interpret the results.

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- 2.1 Discuss Nerusha's anthropometric values and identify the condition she suffers from. Justify your answer. (8)
- 2.2 Mention five associated conditions that she could still develop. (5)
- 2.3 Nerusha asks you to help improve her health. List your goals of treatment. (8)
- 2.4 Calculate her energy and macronutrient requirements for weight loss, using the Schofield equation. (6)
- 2.5 Draw up a diet plan using the exchanges. (10)  
**Fill in your answer on table Appendix A1**
- 2.6 When she was in Dischem she looked at all the special food products available. She wants to know if it is recommended that she buy special products. She is very confused and asks you to explain the difference between "Diabetic" and "Dietetic" and the difference between "No sugar added" and "No added sugar". (7)
- 2.7 The health shop has advised her that she should use fructose in place of sucrose. Would you agree with this? Justify your answer in detail. (6)

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**QUESTION 3**

Sashnee Pather is 30 weeks pregnant with her first child and has just been hospitalized with gestational diabetes. When her gynaecologist checked her blood glucose at 27 weeks they were normal. For the last week she had been feeling very thirsty. Because her husband is diabetic she recognized the symptoms and used his glucometer to test herself. Her fasting blood glucose reading was 9.3 mmol/L. Two years ago she had an unexplained miscarriage at 28 weeks. She has never followed a healthy eating plan and does very little exercise. She has a strong family history of diabetes, with her mother and grandmother being type 2 diabetics. She has gained 17 kg thus far in her pregnancy. She is 163 cm tall and weighs 98.5 kg. She was referred to you for dietary advice.

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- 3.1 Define gestational diabetes. (1)
- 3.2 What is considered the cause of GDM? (2)
- 3.3 List all the risk factors for developing GDM that Sashnee has. (6)
- 3.4 Discuss her fasting glucose level with her and advise her on what pre and post prandial blood glucose levels she should to aim for. (4)
- 3.5 How often and when during the day should she be testing her blood glucose? (2)
- 3.6 What benefits would good blood glucose control offer her and her baby? (9)
- 3.7 Calculate her pre-pregnancy BMI and classify. (2)
- 3.8 Discuss whether she and her baby are at increased risk of developing diabetes at a later stage? (4)
- 3.9 She tells you that her own birth weight was classed as small for gestational age and is surprised that she now has a weight problem. Discuss the “Barker Hypothesis” with her. (8)
- 3.10 When dealing with young diabetic children there are special considerations that need to be taken into account, due to them lacking adult skills. Discuss this statement. (12)

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**QUESTION 4**

Mr De Villiers was rushed to the casualty ward at the local hospital as he was experiencing severe chest pains. He was admitted into the ICU as the doctor diagnosed a myocardial infarction. He had a number of blood test done, including a lipogram. From his file you gather the following information:-

Weight	87 kg
Height	170cm
Age	48 years
Total cholesterol	7.5 mmol/l
LDL cholesterol	4.7 mmol/L
Triglycerides	2.6 mmol/l
HDL cholesterol	0.80 mmol/l
Blood pressure	158/98 mmHg

You obtain the following diet history:-

<b>Breakfast</b>
4 slices seed bread
4 tsp butter
1 apple
1 cup black coffee, no sugar
<b>Lunch</b>
2 white rolls
4 tsp butter
60 g cheddar cheese
½ avocado
1 pear
<b>Supper</b>
120 g roast chicken (dark meat with skin)
200 g roast potato
30 ml sunflower oil (for chicken & potato)
½ cup boiled green beans
½ cup boiled carrots
1 tsp soft margarine added to carrots
<b>Snack</b>
1 cup full cream milk
30 g packet roasted & salted peanuts

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- 4.1 Explain to him what lipogram values he should aim for. (4)
- 4.2 Calculate his current energy intake using exchanges.  
**Fill in your answer on table Appendix A2** (11)
- 4.3 Analyse the fat content of his diet. (Take his total energy intake as 10300 kJ). Show the breakdown of fats in his diet. Calculate the percentage contribution of fat to total energy as well as the percentage contribution of each type of fat to total energy. (Assume 3 SF exchanges from cheese, 4 SF exchanges from chicken and 1.5 SF exchanges from milk).  
**Fill in your answer on table Appendix A3** (7)
- 4.4 Discuss his overall fat intake with him. (5)
- 4.5 Calculate his energy requirement for weight loss. Use the Schofield equation plus an activity factor of 40 %. How does this compare to his current energy intake? (4)
- 4.6 Show how you would adjust his fat intake to comply with the recommendations in the Therapeutic Lifestyle Changes Diet. Use the appropriate energy value that you have calculated.  
**Fill in your answer on table Appendix A4.** (7)
- 4.7 The doctor has told him that he is likely to experience angina. Explain this to him in detail. (5)
- 4.8 What medication do you feel his doctor should start him on in order to lower his cholesterol. Explain to him how the medication works including possible side effects. (7)

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