



## NUT2601

October/November 2017

### NUTRITIONAL CARE

Duration 2 Hours

100 Marks

**EXAMINERS**

FIRST

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SECOND

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**Programmable pocket calculator is permissible**

**Closed book examination**

**This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue**

This examination question paper consists of six (6) pages

Answer ALL the questions in the answer book provided.

Start **each question** on a **new page**, thus QUESTION 1 to QUESTION 6

Where applicable, give all answers using the metric system/SI units. No marks will be awarded for answers with non-metric units of measurement

[TURN OVER]

**QUESTION 1: MULTIPLE-CHOICE QUESTIONS**

Indicate the correct answer by writing the appropriate letter next to the question number in your examination answer book

- 1 1 Which of the following is NOT one of the six classes of nutrients?
- a Fibre
  - b Protein
  - c Minerals
  - d Vitamins
- 1 2 The amount of energy that the body derives from foods is known as the
- a basal metabolism
  - b food combustion value
  - c bomb calorimetry value
  - d physiological fuel value
- 1 3 The feeling of satisfaction resulting from consumption of a meal is termed
- a satiety
  - b appetite
  - c post-absorptive hunger
  - d resting post-absorptive increment
- 1 4 Which of the following is NOT a characteristic of satiety or satiation?
- a Satiety suppresses hunger
  - b Satiation signals the cessation of eating
  - c Satiation develops as food enters the GI tract
  - d Satiety but not hunger may be overridden by stress
- 1 5 The brain chemical neuropeptide Y is known to specifically enhance the craving for
- a fat
  - b salt
  - c protein
  - d carbohydrate
- 1 6 What is the main explanation for the difference in basal metabolic rates between males and females of the same body weight?
- a Males are usually taller than females
  - b Females have lower levels of thyroid hormones
  - c Males have a higher percentage of lean body mass
  - d Females have a lower percentage of adipose tissue
- 1 7 What is the approximate body mass index of a woman who is 172 cm tall and weighs 85 kg?
- a 28,7 kg/m<sup>2</sup>
  - b 49,4 kg/m<sup>2</sup>
  - c 18,5 kg/m<sup>2</sup>
  - d 28,7 kg/m

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- 1 8 In what organ does the digestion process begin?
- Mouth
  - Stomach
  - Duodenum
  - Jejunum-ileum
- 1 9 After swallowing, in what order does food pass through the regions of the GI tract?
- Jejunum, duodenum, colon, ileum, rectum
  - Jejunum, ileum, duodenum, rectum, colon
  - Stomach, duodenum, jejunum, ileum, colon
  - Stomach, jejunum, duodenum, colon, ileum
- 1 10 After a hamburger is eaten, in what organ is the hydrolysis of its proteins initiated?
- Mouth
  - Stomach
  - Small intestine
  - Large intestine
- 1 11 Hunger, satiation and satiety are the responses to both internal and external stimuli. Which of the following is not a physiological influence in the hunger, satiation and satiety cycle?
- the absence of nutrients in the small intestine
  - the brain's pleasure chemicals
  - gastric contractions
  - the taste of food
- 1 12 Which one of the following statements about sphincter contraction is **false**?
- The ileocecal valve prevents food in the colon from moving back into the ileum
  - The pyloric sphincter keeps the chyme in the stomach long enough for it to mix with gastric juices
  - The pyloric sphincter regulates the flow of chyme into the jejunum
  - The lower oesophageal sphincter prevents reflux of the stomach contents into the oesophagus

**QUESTION 2: MATCH THE DESCRIPTION IN COLUMN A WITH THE TERM IN COLUMN B [10]**

Match each description in column A with the most appropriate term in column B. Write down your answers in your answer book, for example, 2 1 A

COLUMN A	COLUMN B
2 1 BMI between 35.0 and 39.9 kg/m <sup>2</sup>	A moderate risk for obesity-related diseases
2 2 Symptom	B used to examine the likelihood that intake is inadequate in a population
2 3 EAR	C subjective
2 4 Lactase	D comprised of galactose and glucose
2 5 Maltose	E obesity class II
2 6 BMI between 30.0 and 34.9 kg/m <sup>2</sup>	F comprised of 2 glucose molecules
2 7 Lactose	G used to examine the likelihood that intake is adequate when no RDA is set for a nutrient
2 8 AI	H 432,6 kJ
2 9 Sign	I enzyme secreted by intestinal cell
2 10 103 kcal	J Objective
	K 1 751 kJ

[TURN OVER]

**QUESTION 3**

Mr Fourie is concerned about whether his diet is balanced or not. After taking a full diet history, you calculate his total energy intake to be **12 400 kJ/day**. With further calculations it is determined that the 12 400 kJ diet contains 450 g of carbohydrate, 210 g of protein and 142 g of fat.

3.1 Calculate the energy distribution for Mr Fourie's diet. Show all calculations. (6)

3.2 Based on your answer in 3.1, compare each nutrient's energy distribution to that of the prudent diet and make practical recommendations accordingly. (6)

3.3 You are now asked to do anthropometric assessment of Mr Fourie. This reveals that he has a height of 1.87 m, weighs 132 kg and has a waist circumference of 122 cm.

3.3.1 Calculate and interpret Mr Fourie's body mass index. (2)

3.3.2 Interpret Mr Fourie's waist circumference and indicate why you can accurately use Mr Fourie's waist circumference to determine if he is at risk for chronic diseases. (3)

3.3.3 Mr Fourie has lost 7 kg in the last month and now weighs 125 kg. Calculate and interpret the percentage weight loss in the past month. (3)

**QUESTION 4****[28]**

4.1 Describe the digestion of carbohydrates in the small intestine and focus on the digestive enzyme involved and where it is secreted as well as the action these enzymes perform on the carbohydrates. Tip: make use of a table. (11)

4.2 Name the two types of protein enzymes that hydrolyse protein in the small intestine. (2)

4.3 Suppose you had a condition in which your stomach produced very little HCl (hydrochloric acid) for an extended period. What would some of the implications for the digestion of protein be and what could be the possible causes of this low production of HCl? How do you think this could influence your nutritional status? (7)

**[TURN OVER]**

- 4.4 Match the organs listed below in the first column with the specific process or its function as listed in the second column (8)

Organ	Function of process
4 4.1 Pyloric sphincter	A) Adds acid, enzymes, and fluid Churns, mixes, and grinds food to a liquid mass
4 4 2 Jejunum	B) Secretes enzymes that digest all energy-yielding nutrients to smaller nutrient particles. Cells of wall absorb nutrients into blood and lymph
4 4 3 Ileocecal valve	C) Chews and mixes food with saliva
4.4.4 Upper oesophageal sphincter	D) Allows passage from small to large intestine Prevents backflow from large intestine
4.4.5 Ileum	E) Keeps rectum closed, opens to allow elimination
4.4 6 Stomach	F) Reabsorbs water and minerals. Passes waste (fibre, bacteria, and unabsorbed nutrients) along with water to the rectum
4 4.7 Anus	G) Allows passage from mouth to oesophagus. Prevents backflow from oesophagus to mouth
4 4 8 Large intestine	H) Allows passage from stomach to small intestine Prevents backflow from small intestine

**QUESTION 5**

[20]

- 5 1. To ensure that the food based dietary guidelines (FBDGs) deal with existing nutrient deficiencies and excesses and the resulting public-health related problems of South Africa, the working group of nutritional experts decided on a number of specific characteristics of the FBDGs Name **six (6)** of these characteristics (6 x ½ = 3)
- 5 2. In your opinion, what should we as nutritional experts do to ensure that South Africans are educated and that they know about the FBDGs? (2)
- 5 3 Guideline 2: "*Be active*". Discuss **five (5)** mechanisms through which physical activity protects individuals against chronic lifestyle diseases (5)
- 5 4 The guidelines "*make starchy food part of most meals*", "*eat plenty of fruit and vegetables*" as well as "*eat dry beans, split peas, lentils and soya regularly*" focuses on carbohydrates and dietary fibre and its health benefit Explain **five (5)** functions of dietary fibre (5)
- 5 5 Explain the constrains of the guideline "meat, fish, chicken and eggs can be eaten every day" and make practical recommendations on how to choose meat, fish, chicken and eggs (5)

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**QUESTION 6**

- 6.1 Thandi has taken your recommendations into account and has adopted a healthier, more balanced diet. Calculate the energy, carbohydrates, protein and fat content of her reported intake for breakfast, which consists of 40 g of Pronutro (wholewheat), two small apples, a glass of low-fat milk and ½ cup fat-free yogurt. Draw and complete the following table on your answer sheet. Make sure to fill the grey blocks. (10)

Food	Size	Exchanges	CHO (g)	Prot (g)	Fat (g)	Energy (kJ)
Wholewheat Pronutro	40 g	1			-	
Small apple	115 g x 2	2		0	0	
Low-fat milk	1 cup (250ml)		12		5	525
Fat-free yogurt	½ cup (125ml)			4	½	

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**TOTAL: 100**