



NUT1602

October/November 2016

NUTRITION AND NUTRIENT DEFICIENCY DISEASES

Duration 2 Hours

100 Marks

EXAMINERS

FIRST

SECOND

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Programmable pocket calculator is permissible

Closed book examination.

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ANSWER ALL THE QUESTIONS

This paper consists of seven (7) pages

INSTRUCTIONS

You have two (2) hours to answer all the questions

This examination is designed to test

- what you know and can recall at the present time**
- how you apply what you have learnt in this course**
- how well you complete all the questions in the time allowed**

[TURN OVER]

QUESTION 1: MULTIPLE-CHOICE QUESTIONS**[30]**

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 a feature of vitamin E in foods?
- a The amount of alpha-tocopherol in foods is underestimated
 - b Saturated fats are the major dietary sources of vitamin E
 - c Most convenience foods are poor sources of vitamin E
 - d Vitamin E is fairly stable when exposed to oxidation
- 1 2 Magnesium is known to be involved in all of the following functions, **except**
- a muscle contractions
 - b the prevention of dental caries
 - c the production of red blood cells
 - d blood clotting
- 1 3 Which amino acid can be used by the body to synthesize niacin when the diet consists of an adequate amount of protein?
- a lysine
 - b valine
 - c tryptophan
 - d phenylalanine
- 1 4 While researching a Southern family's history, you find an interesting pattern where the grandmother and the mother of this family both died fairly young. The symptoms leading up to both of their deaths included diarrhoea, dermatitis, and dementia. This particular family was very poor and lived on a corn-farm. What do you think caused their deaths?
- a scurvy
 - b pellagra
 - c goiter
 - d beriberi
- 1 5 Why might vitamin C supplements be beneficial in the treatment of a common cold?
- a Vitamin C deactivates histamine thereby relieving some of the symptoms of a common cold
 - b Vitamin C reduces the episode of diarrhoea
 - c Vitamin C destroys intestinal pathogens
 - d Vitamin C alters the hypothalamic control of body temperature
- 1 6 All of the following are typical ingredients in an oral rehydration therapy formula, **except**
- a salt
 - b water
 - c protein
 - d sugar

[TURN OVER]

- 1 7 Which of the following would be the most appropriate food source of iodine for a person who lives inland?
- a Fresh-water fish
 - b Iodized table salt
 - c Locally grown produce
 - d Plants of the cabbage family
- 1 8 All of the following are considered heavy metals, **except**
- a iron
 - b lead
 - c mercury
 - d cadmium
- 1 9 Which mineral, when taken per mouth, competes with iron, zinc and calcium by displacing them from the receptor sites, but is unable to perform any of their specific functions in the body?
- a cobalt
 - b chromium
 - c lead
 - d molybdenum
- 1 10 Which of the following provides the most effective and least costly strategy for **preventing** an iron deficiency?
- a Take an iron supplement daily
 - b Eat citrus fruits with every meal
 - c Switch to iron cooking utensils and eat red meat every day
 - d Eat small quantities of red and white meat frequently, together with liberal amounts of vegetables and legumes
- 1 11 A classic sign of zinc deficiency is
- a goitre
 - b growth retardation
 - c scurvy
 - d anaemia
- 1 12 Without vitamin K
- a muscles become atrophic
 - b bones become brittle
 - c skin rashes develop
 - d blood fails to clot
- 1 13 Fat-soluble vitamins
- a are easily excreted
 - b require bile for absorption
 - c seldom reach toxic levels
 - d are not stored by the body's tissues

- 1 14 Folate deficiency has been reported in infants fed
- a infant formula
 - b breast milk
 - c goat's milk
 - d soy milk
- 1 15 Which class of food offers the most thiamine?
- a vegetables
 - b fruit
 - c whole grains and enriched grains
 - d milk products
- 1 16 Which of the following is a good source of vitamin E?
- a egg white
 - b meat
 - c sunflower oil
 - d milk
- 1 17 The intestinal protein that helps to regulate zinc absorption is called
- a metallothionein
 - b hemosiderin
 - c albumin
 - d ferritin
- 1 18 Cooking food in liberal amounts of water is least likely to affect the vitamin content of
- a vitamin C
 - b vitamin A
 - c folate
 - d thiamine
- 1 19 What is most likely to occur when a calcium supplement and an iron supplement are taken simultaneously?
- a Improved absorption of calcium
 - b Impaired absorption of iron
 - c Improved absorption of iron
 - d Impaired absorption of calcium
- 1 20 Keshan disease results from a deficiency of
- a copper
 - b selenium
 - c manganese
 - d molybdenum
- 1 21 Why is milk no longer kept in glass bottles, but rather in light-proof cardboard cartons or opaque plastic bottles?
- a Cardboard and plastic bottles are cheaper forms of packaging material
 - b A large percentage of vitamin B₆ can be lost if kept in glass bottles
 - c Riboflavin is light sensitive and milk products are our major dietary source of this vitamin
 - d All of the above

[TURN OVER]

- 1 22 The process of bone remodelling is known to be dependent on all of the fat-soluble vitamins, **except**
- a vitamin A
 - b vitamin D
 - c vitamin E
 - d vitamin K
- 1 23 Microwaves should not be used as a preferred cooking method for meat, since meat provides us with vitamin , which are readily destroyed by microwave cooking
- a B₁
 - b B₆
 - c B₁₂
 - d B₂
- 1 24 Which of the following compounds serves as the major precursor for the body's synthesis of vitamin D?
- a tryptophan
 - b cholesterol
 - c beta-carotene
 - d eicosapentanoic acid
- 1 25 What tissue contains the majority of the body's vitamin A?
- a adipose
 - b retinal cells
 - c liver
 - d intestinal mucosal cells
- 1 26 The sudden deaths that occur in children with kwashiorkor are thought to result from heart failure caused by
- a loss of magnesium
 - b loss of potassium
 - c excessive sodium intake
 - d excessive chlorine intake
- 1 27 Which vitamin combines with an intrinsic factor before it can be absorbed?
- a B₁
 - b B₆
 - c B₁₂
 - d B₂
- 1 28 Which of the following regulates the level of calcium in the blood?
- a glucagon and insulin
 - b epinephrin and norepinephrin
 - c parathyroid hormone and calcitonin
 - d cortisol

- 1 29 Chromium assists this hormone to function optimally
- insulin
 - renin
 - antidiuretic hormone
 - gastrin
- 1 30 How does vitamin C enhance iron absorption when consumed in the same meal?
- It releases iron from the proteins in the food
 - It activates the hormones needed to absorb iron
 - It forms a complex with iron that promotes mucosal transport
 - It keeps iron in the reduced ferrous form for optimal absorption

QUESTION 2: MATCH COLUMN A WITH COLUMN B**[10]**

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

COLUMN A	COLUMN B
2 1 A nutrient also considered to be a pro-hormone	A Fluorosis
2 2 A term explaining how nutrients affect one another's absorption, metabolism and excretion	B Osteomalacia
2 3 A nutrient with a conserving effect on vitamins A, B and E	C Vitamin D
2 4 Differentiate vitamin C from the B-complex vitamins	D Vitamin C
2.5 Water that is retained within the body's cells	E Hemolytic
2 6 Vitamin D deficiency in adults	F Edema
2 7 Vitamin A deficiency	G Wilson's disease
2 8 A condition associated with discoloration of tooth enamel	H Keratomalacia
2 9 Copper accumulation in the liver and brain	I Interdependency
2 10 Type of anaemia prevented by vitamin E	J Not a co-enzyme

QUESTION 3**[10]**

- 3 1 Use your knowledge of the minerals to explain how the two groups, namely major minerals and trace minerals, differ from each other, and then list three examples of each (8)
- 3 2 Briefly summarize how minerals differ from vitamins (2)

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QUESTION 4**[30]**

- 4 1 Provide guidelines and alternative food sources for people who cannot consume milk, or who dislike milk, to still meet their calcium requirements (6)
- 4 2 Mention two groups of people who may easily suffer a thiamine deficiency and also why this deficiency develops in these people (7)
- 4 3 Compile general guidelines for the public to guide them on the best ways to meet their daily fluid needs (7)
- 4 4 A high sodium intake in the form of salt is associated with the disease condition hypertension in certain ethnic groups that are labelled to be salt sensitive. What guidelines can you give the public to reduce their salt intake? (10)

QUESTION 5**[20]**

The body uses the antioxidant nutrients as a defence against free-radical damage. These defence actions play key roles in defending the body against chronic diseases.

- 5 1 List four (4) nutrients known for their anti-oxidant properties (4)
- 5 2 Name three (3) examples of diseases for which anti-oxidant nutrients may have a protective effect (3)
- 5 3 Why would you recommend that people obtain their anti-oxidants from food rather than from supplements? (6)
- 5 4 It is evident that the best way to consume antioxidants is from the diet in the form of food. We should not single out one particular food for its "magical" nutrient, antioxidant or phytochemical, but instead eat a wide variety of food every day to get all the benefits these foods have to offer. Briefly mention one or two (depending on the marks allocated) foods from each of the following food groups that are well-known for their high anti-oxidant contents
- 5 4 1 Fruits (2)
- 5 4 2 Vegetables (2)
- 5 4 3 Grains (1)
- 5 4 4 Legumes (1)
- 5 4 5 Nuts (1)

TOTAL: 100