



NUT1602

May/June 2017

NUTRITION AND NUTRIENT DEFICIENCY DISEASES

Duration 2 Hours

100 Marks

EXAMINERS

FIRST

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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 may lead to a decreased resistance to infections
- a An excess of vitamin C
 - b A deficiency of vitamin A
 - c A deficiency of vitamin D
 - d An excess of the B-complex vitamins
- 1 2 Which of the following nutrients has functions similar to those of vitamin E?
- a chromium
 - b iron
 - c molybdenum
 - d selenium
- 1 3 Calcium absorption is facilitated by the presence of
- a lactose
 - b fibre
 - c phytic acid
 - d oxalic acid
- 1 4 Which mineral deficiency can cause tooth decay?
- a fluoride
 - b copper
 - c zinc
 - d iodine
- 1 5 One of the most vulnerable groups for iron deficiency is
- a men aged 20-35 years old
 - b teenage girls
 - c elderly men
 - d elderly women
- 1 6 What is meant by the bioavailability of a vitamin in food?
- a the amount absorbed and subsequently used by the body
 - b the amount available from plant and animal food
 - c the number of different chemical forms of the same vitamin
 - d the amount that escapes destruction by food processing
- 1 7 Which of the following is the most effective and least costly strategy for preventing an iron deficiency?
- a Consume iron supplements at a level 2-3 times the RDA
 - b Eat small amounts of citrus products and increase of low-fat milk
 - c Switch to iron cooking utensils and eat four servings of red meat daily
 - d Eat small quantities of meat, fish and poultry frequently, together with liberal amounts of vegetables and legumes

[TURN OVER]

- 1 8 The process of bone remodelling is known to be dependent on all of the fat-soluble vitamins **except**:
- Vitamin A
 - Vitamin B
 - Vitamin C
 - Vitamin D
- 1 9 Microwaves should not be used as a preferred cooking method for foods that are high in vitamin
- B₁
 - B₃
 - B₆
 - B₁₂
- 1 10 Magnesium is known to be involved in all of the following **except**
- blood clotting
 - muscle contraction
 - prevention of dental caries
 - production of red blood cells
- 1 11 How does the antidiuretic hormone function?
- it activates rennin
 - it stimulates water reabsorption by the kidneys
 - it activates angiotensin
 - it stimulates sodium reabsorption by the kidneys
- 1 12 Fat soluble vitamins
- are easily excreted
 - seldom reach toxic levels
 - are not stored by the body's tissues
 - require bile for absorption
- 1 13 Which of the following is a good source of vitamin E?
- egg white
 - meat
 - milk
 - polyunsaturated plant oils
- 1 14 Which of the following is a feature of calcium in the body?
- High blood calcium levels correlate with tetany
 - High calcium intakes correlate with lower body fatness
 - Children absorb calcium just as efficient as adults
 - Abnormal dietary calcium intake promotes calcium rigo
- 1 15 Which of the following features do vitamins A and C share?
- Both require bile for absorption
 - Neither participates in protein synthesis
 - Both function as antioxidants
 - Neither is affected by the processing of foods
- 1 16 Cretinism is caused primarily by a deficiency of
- iron
 - zinc
 - selenium
 - iodine

[TURN OVER]

- 1 17 Requirements for vitamin C are highest for
- a the elderly
 - b children
 - c smokers
 - d alcoholics
- 1 18 Water that has a high sodium or potassium content is termed
- a enriched
 - b soft
 - c hard
 - d artesian
- 1 19 New-born infants require vitamin K injections because
- a breastmilk is a poor source of vitamin K
 - b infants have a sterile gastrointestinal tract at birth
 - c infants cannot eat meat
 - d phyloquinone may cause bleeding in infants
- 1 20 The compound that represents iron storage in the cells of the small intestine is
- a ferritin
 - b transferrin
 - c myoglobin
 - d enterocytes
- 1 21 Keshan disease results from a deficiency of
- a copper
 - b selenium
 - c manganese
 - d molybdenum
- 1 22 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 23 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 24 What is the term used to define foods that contain non-nutrient substances whose known action in the body is to promote well-being to a greater extent than well-being contributed by the food's nutrients?
- a B₁
 - b B₆
 - c B₁₂
 - d B₂
- 1 25 How does vitamin C enhance iron absorption when consumed in the same meal?
- a It releases iron from the proteins in the food
 - b It activates the hormones needed to absorb iron
 - c It forms a complex with iron that promotes mucosal transport
 - d It keeps iron in the reduced ferrous form for optimal absorption
- 1 26 Which mineral deficiency can cause the birth defect, cretinism
- a fluoride
 - b copper
 - c zinc
 - d iodine
- 1 27 Which of the following statements regarding calcium is **not true**?
- a calcium is important for bone health
 - b orange juice is a good source of calcium
 - c the adequate intake (AI) for calcium in teenagers is 1300 mg/day
 - d megadoses of calcium may lead to constipation
- 1 28 Usually approximately 30–40% of the dietary calcium is absorbed. Which dietary factors are known to enhance absorption of calcium?
- a ascorbic acid
 - b phosphorus
 - c lactose
 - d all of the above
- 1 29 What is the RDA for iron for women of childbearing age?
- a 8 mg
 - b 12 mg
 - c 18mg
 - d 45 mg
- 1 30 The anaemia caused by Vitamin B12 deficiency is called
- a microcytic anaemia
 - b hypochromic anaemia
 - c pernicious anaemia
 - d sickle cell anaemia

[TURN OVER]

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 the answer book, for example, 2 1 A

COLUMN A	COLUMN B
2 1 Prevents poly-unsaturated fatty acids from being oxidised	A Phosphorus
2 2 Performs important structural roles in the body	B Iodine
2 3 Also called ascorbic acid	C Anti-acid preparations
2 4 Differentiates vitamin C from the B-complex vitamins	D Iron
2 5 Inhibits iron absorption	E Vitamin K
2 6 Incorporated into the thyroid hormone thyroxin	F Calcium
2 7 Vitamin A deficiency	G Vitamin E
2 8 Required from food in amounts greater than 100 mg/day	H Keratomalacia
2 9 Plays an important role in synthesising proteins needed for the formation of bone and teeth	I Vitamin C
2 10 Unique in that the body continually recycles this nutrient	J Not a co-enzyme

QUESTION 3**[11]**

- 3 1 Nutritional scientists have developed a set of standards that define the amounts of nutrients our bodies need in order to support and maintain our health. Use your knowledge of the DRIs to distinguish between the Estimated Average Requirements (EAR) and the Recommended Dietary Allowance (RDA)? (6)
- 3 2 Briefly explain why there are only Adequate Intake (AI) values available for the electrolytes sodium, chloride and potassium? (3)
- 3 3 Define the term "Adequate Intake" (2)

QUESTION 4**[19]**

An adequate calcium intake is very important for the development of a healthy skeleton in early life and for minimising bone loss in later life

- 4 1 List the six specific food sources that contain vitamin D naturally (6)
- 4 2 Although vitamin D can be obtained without food consumption, there are many factors that may contribute to a vitamin D deficiency. List these factors (8)

[TURN OVER]

- 4 3 The American Academy of Paediatrics recommends vitamin D supplements for all breastfed infants until they can consume adequate amounts of vitamin D-rich foods. What deficiency disease do they aim to prevent and what are the typical symptoms for this disease? (5)

QUESTION 5**[30]**

- 5 1 Niacin is the only B-vitamin that causes toxicity symptoms
- 5 1 1 Discuss the toxicity symptoms that are associated with large doses of niacin from supplements or drugs (4)
- 5 1 2 Distinguish between niacin obtained from food versus niacin obtained from supplements or drugs (2)
- 5 1 3 Name and distinguish between the two forms of niacin that are commonly found in supplements by referring to their toxicity potential and therapeutic use in heart disease (8)
- 5 2 The niacin-deficiency disease, pellagra, caused widespread misery in the early 1900s
- 5 2 1 Why is niacin considered to be unique among the B-vitamins? (3)
- 5 2 2 Discuss the main nutritional reasons for the widespread niacin deficiency that was seen in the early 1900s (9)
- 5 3 3 List the most common symptoms of pellagra (4)

TOTAL: 100

