

**ROYAL CIVIL SERVICE COMMISSION  
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2024  
EXAMINATION CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALISATION PAPER FOR NUTRITION AND DIETETICS**

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<b>Date</b>	: October 5, 2024
<b>Total Marks</b>	: 100
<b>Writing Time</b>	: 150 minutes (2.5 hours)
<b>Reading Time</b>	: 15 Minutes (prior to writing time)

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**GENERAL INSTRUCTIONS:**

1. Write your Registration Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is to check the number of pages of Question Paper, printing errors, clarify doubts and to read the instructions. You are NOT permitted to write during this time.
3. This paper consists of **TWO SECTIONS**, namely SECTION A & SECTION B:
  - **SECTION A** has two parts: Part I - 30 Multiple Choice Questions  
Part II - 6 Short Answer Questions  
All questions under SECTION A are **COMPULSORY**.
  - **SECTION B** consists of two **QUESTIONS**. All the questions under SECTION B are **COMPULSORY**.
4. All answers should be written on the Answer Booklet provided to you. Candidates are not allowed to write anything on the question paper. If required, ask for additional Answer Booklet.
5. All answers should be written with correct numbering of Section, Part and Question Number in the Answer Booklet provided to you. Note that any answer written without indicating the correct Section, Part and Question Number will NOT be evaluated and no marks would be awarded.
6. Begin each Section and Part in a fresh page of the Answer Booklet.
7. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
8. Use of any other paper including paper for rough work is not permitted.
9. **You are required to hand over the Answer Booklet to the Invigilator before leaving the examination hall.**
10. This paper has **8 printed pages**, including this instruction page.

**GOOD LUCK**

**SECTION A**

**PART I: Multiple Choice Questions (30 marks)**

**Choose the correct answer and write down the letter of your chosen answer in the Answer booklet against the question number e.g. 31 (d). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.**

1. Which of the following amino acids is considered conditionally essential during periods of rapid growth, illness, or stress?
  - a) Valine
  - b) Glutamine
  - c) Leucine
  - d) Methionine
  
2. Which enzyme is responsible for the initial breakdown of starch in the mouth?
  - a) Pepsin
  - b) Amylase
  - c) Lipase
  - d) Maltase
  
3. Which vitamin is involved in the carboxylation of glutamic acid residues on proteins required for blood clotting?
  - a) Vitamin C
  - b) Vitamin E
  - c) Vitamin K
  - d) Vitamin B6
  
4. Which hormone is primarily responsible for lowering blood glucose levels after a meal?
  - a) Glucagon
  - b) Insulin
  - c) Cortisol
  - d) Epinephrine
  
5. What is the primary function of the urea cycle in the liver?
  - a) Detoxify ammonia
  - b) Convert glucose to glycogen
  - c) Synthesize fatty acids
  - d) Produce ketone bodies
  
6. Which of the following is a key diagnostic criterion for metabolic syndrome?
  - a) Elevated HDL cholesterol
  - b) Elevated triglycerides
  - c) Low blood pressure
  - d) Increased waist circumference

7. Which dietary pattern is most recommended for patients with chronic kidney disease to manage hyperkalemia?
  - a) High-protein diet
  - b) Low-potassium diet
  - c) High-fiber diet
  - d) Low-fat diet
  
8. Which nutrient deficiency is commonly associated with the development of microcytic anemia?
  - a) Vitamin B12
  - b) Folate
  - c) Iron
  - d) Vitamin D
  
9. In the management of type 1 diabetes, what is the primary benefit of continuous glucose monitoring (CGM)?
  - a) Reducing insulin resistance
  - b) Preventing ketoacidosis
  - c) Tracking blood glucose trends in real time
  - d) Increasing physical activity levels
  
10. What is the recommended daily intake of protein for a patient undergoing hemodialysis?
  - a) 0.8 g/kg body weight
  - b) 1.0 g/kg body weight
  - c) 1.2-1.5 g/kg body weight
  - d) 2.0 g/kg body weight
  
11. What is the purpose of conducting a Hazard Analysis Critical Control Point (HACCP) plan in a foodservice operation?
  - a) Reduce food cost
  - b) Ensure nutritional adequacy
  - c) Prevent foodborne illness
  - d) Improve employee satisfaction
  
12. Which inventory management method involves tracking the expiration dates of perishable items and using the oldest items first?
  - a) FIFO (First In, First Out)
  - b) LIFO (Last In, First Out)
  - c) ABC method
  - d) JIT (Just In Time)
  
13. In a hospital foodservice operation, what is the primary advantage of using a centralized meal delivery system?
  - a) Improved patient satisfaction
  - b) Increased food variety
  - c) Better portion control
  - d) Reduced labor costs

14. What is the primary goal of a quality improvement program in a healthcare foodservice setting?
- a) Increase revenue
  - b) Enhance patient outcomes
  - c) Reduce food waste
  - d) Improve employee morale
15. Which of the following is a key component of the Nutrition Care Process (NCP)?
- a) Meal planning
  - b) Nutrition screening
  - c) Budgeting
  - d) Inventory management
16. Which of the following is an example of a water-soluble vitamin?
- a) Vitamin A
  - b) Vitamin D
  - c) Vitamin E
  - d) Vitamin C
17. Which foodborne pathogen is most commonly associated with undercooked poultry?
- a) Salmonella
  - b) Listeria
  - c) Escherichia coli (E. coli)
  - d) Clostridium botulinum
18. What is the primary purpose of blanching vegetables before freezing them?
- a) Increase nutrient content
  - b) Improve flavour
  - c) Inactivate enzymes
  - d) Enhance texture
19. Which of the following is a common food additive used to prevent oxidation in processed foods?
- a) Ascorbic acid
  - b) Sodium chloride
  - c) High fructose corn syrup
  - d) Monosodium glutamate (MSG)
20. Which nutrient is most susceptible to destruction during cooking and food processing?
- a) Vitamin A
  - b) Vitamin C
  - c) Vitamin D
  - d) Vitamin K

21. In a randomized controlled trial, what is the primary purpose of randomization?
- a) Increase sample size
  - b) Ensure blinding
  - c) Reduce bias
  - d) Simplify data analysis
22. Which statistical test is used to compare the means of two independent groups?
- a) Chi-square test
  - b) T-test
  - c) ANOVA
  - d) Correlation
23. What is the main function of lipoproteins in the body?
- a) Store vitamins
  - b) Transport fats and cholesterol
  - c) Catalyze chemical reactions
  - d) Maintain fluid balance
24. Which nutrient deficiency is commonly observed in Bhutan due to limited dietary diversity and reliance on staple foods like rice and maize?
- a) Vitamin A
  - b) Iron
  - c) Vitamin C
  - d) Calcium
25. The prevalence of child stunting in Bhutan from the NHS 2023 survey is
- a) 22.4%
  - b) 21.2%
  - c) 33.5%
  - d) 17.9%
26. Which of the following is the most appropriate initial step in assessing a patient with suspected malnutrition in a clinical setting?
- a) Prescribing a high-protein diet
  - b) Conducting a comprehensive dietary recall
  - c) Measuring serum albumin levels
  - d) Initiating a nutrition care plan
27. What disease is caused by SARS-CoV-2?
- a) Middle East Respiratory Syndrome (MERS)
  - b) Severe Acute Respiratory Syndrome (SARS)
  - c) COVID-19
  - d) H1N1 Influenza

28. Increased susceptibility to infection is a clinical impact of
- a) Neurological effects
  - b) Endocrine system
  - c) Immune system
  - d) Gastrointestinal system
29. Breast milk has almost no amount of
- a) Potassium
  - b) Iron
  - c) Fluoride
  - d) Magnesium
30. An index used to measure stunting or chronic malnutrition
- a) Weight for height or length
  - b) MUAC for age, sex and height
  - c) Weight for age
  - d) Height for age

**PART II – Short Answer Questions (20 marks)**

**Answer ALL the questions. Mark for each sub-question is indicated in the brackets.**

1. Describe key differences between Type 1 and Type 2 diabetes. **(2.5 marks)**
2. Discuss the impact of insulin on glucose metabolism in the body **(2.5 marks)**
3. Explain the rationale behind the DASH diet for managing hypertension. **(2.5 marks)**
4. Explain the role of gut microbiota in the development of obesity. **(2.5 marks)**
5. Discuss the nutritional management of a patient with chronic kidney disease (CKD) **(5 marks)**
6. Describe the process and significance of using the Nutrition Care Process (NCP) in dietetic practice. **(5 marks)**

**SECTION B: Case Study (50 marks)**

**This section consists of two questions carrying 25 marks each. All the questions are compulsory. Mark for each sub-question is indicated in the brackets.**

**Case 1 (25 marks)**

**Patient Information:**

- **Name:** Mr. Dorji Tshering
- **Age:** 65 years
- **Gender:** Male
- **Height:** 170 cm
- **Weight:** 70 kg
- **BMI:** 24.2 kg/m<sup>2</sup> (Normal weight)
- **Medical History:**
  - Chronic Kidney Disease (Stage 3)
  - Hypertension
  - Gout
- **Lifestyle:**
  - Moderate physical activity, enjoys walking
  - Diet high in red meats, salty foods, and low in fruits and vegetables

1. Identify two dietary concerns based on Mr. Dorji Tshering's current diet. **(2 marks)**
2. Explain why it is important to monitor Mr. Dorji Tshering's protein intake given his Chronic Kidney Disease. **(3 marks)**
3. Write one PES (Problem, Etiology, Signs/Symptoms) statement for Mr. Dorji Tshering's Chronic Kidney Disease. **(3 marks)**
4. Write one PES statement related to his Gout. **(3 marks)**
5. Suggest two dietary changes to help manage Mr. Dorji Tshering's Chronic Kidney Disease. **(4 marks)**
6. Recommend two dietary changes to help manage Mr. Dorji Tshering's Gout. **(4 marks)**
7. Propose one strategy to increase Mr. Dorji Tshering's intake of fruits and vegetables. **(3 marks)**
8. Identify one short-term and one long-term goal for Mr. Dorji Tshering's nutrition care plan. **(3 marks)**

**Case 2 (25 marks)**

**Patient Information:**

1. **Name:** Ms. Yeshi Choden
2. **Age:** 30 years

3. **Gender:** Female
4. **Height:** 160 cm
5. **Weight:** 60 kg
6. **BMI:** 23.4 kg/m<sup>2</sup> (Normal weight)
7. **Medical History:**
  - Polycystic Ovary Syndrome (PCOS)
  - Irregular menstrual cycles
  - History of mild anxiety
  - Family history of Type 2 Diabetes
8. **Lifestyle:**
  - Moderately active, practices yoga 3 times a week
  - Diet is high in refined carbohydrates and sugary snacks
  - Consumes alcohol occasionally (1-2 drinks per week)
  - Limited fruit and vegetable intake
9. **Laboratory Results:**
  - Fasting Blood Glucose: 102 mg/dL
  - HbA1c: 5.7%
  - Total Cholesterol: 190 mg/dL
  - LDL: 120 mg/dL
  - HDL: 45 mg/dL
  - Triglycerides: 140 mg/dL

1. Identify two dietary concerns based on Ms. Yeshi Choden's current diet. **(3 marks)**
2. Explain the significance of Ms. Yeshi Choden's HbA1c level in the context of her family history of Type 2 Diabetes. **(3 marks)**
3. Discuss two potential dietary strategies to help manage Ms. Yeshi Choden's Polycystic Ovary Syndrome (PCOS) **(4 marks)**
4. Propose a full diet plan for Ms. Yeshi Choden that addresses her PCOS, prediabetic status, and lifestyle. Include calculations of her estimated daily calorie requirements, as well as macronutrient distribution (carbohydrates, proteins, and fats) based on these needs. **(10 marks)**
5. Identify one short-term and one long-term nutritional goal for Ms. Yeshi Choden. **(3 marks)**
6. Mention one way to monitor Ms. Yeshi Choden's progress in managing her PCOS and prediabetic status. **(2 marks)**

**TASHI DELEK**