THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

155/2 **FOOD AND HUMAN NUTRITION 2**

(For Both School and Private Candidates)

Time : 3 Hours **ANSWERS** **Year : 2009**

Instructions

1. This paper consists of sections **A** and **B**.
2. Answer all questions in section **A** and only **two (2)** question from section **B**.
3. Non-programmable calculators may be used.
4. Communication devices and any unauthorised materials are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

SECTION A (60 Marks)

Answer all questions in this section

1. Define food quality control and explain four activities used in maintaining food quality during processing.

Food quality control is the process of ensuring that food products meet specific standards of safety, nutritional value, taste, and appearance, from raw materials to the final product. It involves systematic checks and procedures that guarantee consumers receive food that is safe and acceptable for consumption.

One activity in food quality control is raw material inspection. At this stage, ingredients are carefully examined before processing to ensure they are free from contaminants, meet required standards, and are suitable for use in production. Poor-quality raw materials compromise the entire production line.

Another activity is process monitoring. During processing, parameters such as temperature, pH, moisture, and time are closely controlled. This ensures harmful microorganisms are destroyed, nutrients are preserved, and the product maintains the desired characteristics.

A third activity is laboratory testing. Samples of food are tested for microbial contamination, chemical residues, and nutrient composition. This provides scientific evidence that the food meets safety and nutritional requirements.

A fourth activity is packaging inspection. Proper packaging not only protects food from contamination but also preserves its quality. Inspectors ensure that packaging materials are clean, airtight, and labelled correctly to maintain product integrity until consumption.

2. Describe six health practices that should be promoted when providing nutrition education to caregivers of malnourished children.

Caregivers should be encouraged to practice exclusive breastfeeding for the first six months of a child's life. This ensures the child receives adequate nutrients and antibodies that strengthen immunity.

Another practice is timely introduction of complementary foods. From six months onward, caregivers should gradually introduce soft, nutrient-rich foods to meet the growing energy and nutrient demands of the child.

Good sanitation and hygiene should also be emphasized. Caregivers need to wash hands with soap before feeding, clean utensils properly, and ensure safe water use, as contaminated environments increase the risk of diarrhoea and further malnutrition.

Regular health check-ups should be promoted. Taking children for growth monitoring helps detect malnutrition early, while vaccinations protect them from diseases that worsen their nutritional status.

Caregivers should also learn about balanced meal preparation. They should be taught to use locally available foods in the right proportions of carbohydrates, proteins, and vitamins to strengthen the child's health.

Finally, awareness about feeding frequency is essential. Malnourished children often have poor appetites, so caregivers should provide small but frequent meals throughout the day to maximize intake.

3. Outline four intrinsic factors that affect the growth of microorganisms in foods and explain their effects.

The first intrinsic factor is moisture content. Microorganisms thrive in foods with high water activity, such as meat, milk, and fruits. Foods with low moisture, like dried grains, limit microbial growth and remain safe longer.

The second factor is pH level. Most microorganisms prefer a near-neutral pH between 4.6 and 7. Foods like vegetables and cooked meats provide ideal conditions, whereas acidic foods like citrus fruits and vinegar inhibit microbial growth.

The third factor is nutrient availability. Microorganisms depend on proteins, carbohydrates, and fats for growth. Protein-rich foods such as eggs and dairy products are highly susceptible to microbial spoilage.

The fourth factor is the natural antimicrobial compounds found in foods. Some foods, like garlic and onions, contain natural chemicals that inhibit microbial growth. These compounds act as protective barriers against foodborne pathogens.

4. Explain five roles of nutrition education programmes in preventing non-communicable diseases.

Nutrition education helps individuals understand the importance of balanced diets, which reduces risks of diseases such as diabetes, hypertension, and obesity. By spreading awareness, people learn to reduce excess sugar, salt, and fat intake.

It also promotes healthy lifestyles by encouraging regular physical activity alongside proper diet. This combination lowers the risk of cardiovascular diseases, which are linked to sedentary living.

Nutrition education addresses harmful eating habits, such as frequent consumption of processed and fast foods. Teaching individuals to prepare healthier meals at home contributes to long-term health.

Another role is equipping communities with knowledge about early detection and prevention of deficiencies. For instance, promoting intake of calcium-rich foods helps prevent osteoporosis, while fruits and vegetables lower cancer risks.

Finally, nutrition education empowers policy advocacy. Educated individuals demand healthier food options in markets, schools, and workplaces, indirectly shaping the food environment to prevent non-communicable diseases.

5. Identify six signs and symptoms of marasmus in under-five children.

Children with marasmus exhibit severe wasting, where muscles and fat tissues shrink, leaving the child extremely thin.

The ribs and bones become visible because of loss of fat under the skin, giving the child a skeletal appearance.

Another symptom is stunted growth. Children with marasmus are much shorter than expected for their age due to prolonged undernutrition.

Their faces often appear old and wrinkled, a result of extreme loss of body fat and elasticity of the skin.

They usually have reduced energy and are very weak, unable to play or engage in activities normal for their age.

Additionally, marasmic children show irritability and poor appetite, making it even harder to meet their nutritional needs.

6. Discuss five problems facing catering establishments in urban centres.

One major problem is high operational costs. Rent, electricity, and water bills are expensive in urban centres, making it difficult for catering businesses to maintain profitability.

Competition is another significant problem. With many catering services available in cities, businesses struggle to attract and retain customers, especially without unique offerings.

Urban catering establishments also face issues of unreliable supply chains. Traffic congestion and poor infrastructure delay delivery of fresh ingredients, leading to spoilage and shortages.

Labour challenges also exist, as skilled chefs and workers demand high wages, while unskilled workers affect service quality. This imbalance creates staffing difficulties.

Finally, changing consumer preferences pose a challenge. Urban populations often demand fast, convenient, yet healthy meals, and catering services must continuously adapt to meet these expectations.

SECTION B (40 Marks)

Answer only two questions from this section

7. "Nutrition problems require multisectoral solutions." Critically analyse the role of the health, agriculture, and education sectors in reducing malnutrition.

The health sector plays a key role by providing preventive and curative services. It ensures immunizations, treatment of diseases like diarrhoea, and nutritional supplementation such as vitamin A and iron, which directly address malnutrition.

The agriculture sector contributes by improving food availability. Through diversification of crops, irrigation, and livestock rearing, it ensures households have access to a variety of nutrient-rich foods instead of relying on staples alone.

The education sector strengthens nutrition through school feeding programmes and nutrition education in the curriculum. Educating children early instils lifelong healthy habits and reduces risks of malnutrition.

Working together, these sectors create a sustainable solution. For example, the agriculture sector produces fortified crops, the health sector distributes them through health centres, and the education sector ensures children understand their value. This coordination demonstrates that no single sector can solve malnutrition alone.

8. Discuss six practical solutions to challenges facing breastfeeding in working mothers.

One solution is the provision of maternity leave. Extending leave allows mothers to exclusively breastfeed during the first crucial months of a child's life.

Workplaces can also establish breastfeeding-friendly facilities. Private rooms where mothers can express milk provide convenience and comfort, encouraging continued breastfeeding.

Flexible working hours are another solution. Allowing mothers to adjust schedules helps them balance work responsibilities and breastfeeding needs.

On-site childcare services reduce the challenge of being separated from infants. Mothers can breastfeed during breaks, improving child nutrition.

Providing education on expressing and storing breast milk is vital. This empowers mothers to continue breastfeeding even when away from their children.

Finally, supportive workplace policies and laws are necessary. Governments and employers must legally protect the rights of breastfeeding mothers, ensuring they are not discriminated against.

9. Evaluate the significance of quality assurance systems in food processing industries, giving six points.

Quality assurance systems ensure consumer safety by preventing contamination and guaranteeing food is free from harmful substances.

They also build consumer trust, as customers are more confident in buying products that meet recognized safety and quality standards.

Such systems improve efficiency by reducing wastage, since errors in production are detected early and corrected.

They support compliance with national and international regulations, allowing food industries to trade more easily in local and global markets.

Quality assurance also protects brand reputation. Consistently high-quality products keep customers loyal and strengthen market position.

Lastly, these systems encourage continuous improvement by regularly monitoring and upgrading processes, which keeps industries competitive.

10. Examine the importance of resource control in catering operations and propose six methods of effective resource utilization.

Resource control ensures catering businesses remain profitable by reducing unnecessary expenditures and preventing wastage. Proper management of food, labour, and utilities keeps operations sustainable.

Effective resource utilization can be achieved through accurate forecasting of demand. Predicting customer numbers helps avoid overproduction and food spoilage.

Training staff is another method, as skilled employees handle food, equipment, and time more efficiently, reducing losses.

Inventory management plays a central role. Keeping track of stock ensures timely reordering and prevents both shortages and overstocking.

Energy conservation methods, such as using energy-efficient appliances, reduce utility costs and protect the environment.

Portion control ensures customers receive consistent servings while preventing food wastage. This practice improves customer satisfaction and profitability.

Finally, adopting modern technology like computerized billing and stock systems improves accuracy, reduces human error, and enhances overall efficiency in resource use.