

VU Learning HUB

BIO5102 Quiz File

Chapter-wise Solved MCQs

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Lesson 1: Introduction to Public Health

1. What is the primary focus of public health compared to clinical medicine?

- A) Diagnosing and treating individual patients one at a time
- B) Protecting and promoting the health of whole populations through organized societal efforts
- C) Managing private clinical hospital operations
- D) Developing targeted pharmaceutical therapies for individual cases

2. Which of the following is one of the three core functions of public health that involves monitoring population health status and investigating health hazards?

- A) Assessment
- B) Individual patient rehabilitation
- C) Surgical intervention
- D) Tertiary clinical treatment

3. Which historic event in 1854 contributed to the founding of modern epidemiology?

- A) The Ottawa Charter agreement
- B) John Snow mapping London cholera cases and removing the Broad Street pump handle
- C) The global eradication of smallpox
- D) The adoption of the Alma-Ata Declaration

4. What key concept was established by the 1978 Alma-Ata Declaration as the core route to "Health for All"?

- A) Specialized hospital care
- B) Primary health care
- C) Commercial health insurance
- D) Advanced clinical diagnostics

Answer Key

1. B — Public health focuses on protecting the health of entire populations rather than treating single individual patients.
2. A — Assessment is a core public health function focused on monitoring community health status and identifying health hazards.
3. B — John Snow mapped cholera cases in London in 1854 and removed the Broad Street pump handle, establishing modern epidemiology.
4. B — The 1978 Alma-Ata Declaration established primary health care as the fundamental approach to achieving "Health for All".

Lesson 2: Determinants of Health and Disease

1. How are the determinants of health defined in the handout?

- A) Biological pathogens that cause infectious diseases
- B) The range of personal, social, economic, and environmental factors influencing health status
- C) Specialized medical interventions provided in hospitals
- D) The direct financial cost of medical treatment and medication

2. Which disease is categorized as a non-communicable disease (NCD) resulting from lifestyle, genetic, and environmental factors?

- A) Dengue

- B) Tuberculosis
- C) Type 2 diabetes
- D) Hepatitis

3. What does the "double burden of disease" refer to in regions like Pakistan?

- A) High financial costs affecting both urban and rural hospitals
- B) Coexistence of ongoing communicable disease burdens alongside rising non-communicable diseases
- C) Simultaneous reliance on public and private health care facilities
- D) Genetic disorders combined with malnutrition in children

4. According to the handout, how does health equity differ from health equality?

- A) Equality gives everyone the same resources, whereas equity gives what each person needs to address unfair differences.
- B) Equality applies to infectious diseases, whereas equity applies only to NCDs.
- C) Equity provides uniform services across all districts, while equality targets high-risk areas.
- D) Equality focuses on environmental factors, whereas equity focuses on biological traits.

Answer Key

1. B — Determinants of health are defined as the personal, social, economic, and environmental factors that shape health status.
2. C — Type 2 diabetes is a non-communicable disease linked to lifestyle and environmental risk factors rather than pathogens.
3. B — The double burden represents the concurrent challenge of persistent infectious diseases and rapidly increasing non-communicable conditions.
4. A — Equality distributes equal resources to all, while equity distributes resources according to specific needs to resolve avoidable differences.

Lesson 3: Basic Epidemiology for Public Health

1. How is epidemiology defined in the handout?

- A) The clinical diagnosis and treatment of individual patient symptoms
- B) The study of the distribution and determinants of health-related states in populations, and the application of this study to control health problems
- C) The administrative management of public health facilities
- D) The laboratory identification of infectious organisms

2. Which measure of disease frequency is defined as "new cases in a period divided by population at risk"?

- A) Prevalence
- B) Case fatality rate
- C) Incidence
- D) Mortality rate

3. Which study design moves forward from exposure to disease, measures incidence, and establishes temporality?

- A) Case-control study
- B) Cohort study
- C) Cross-sectional study
- D) Randomized controlled trial

4. What three components make up the epidemiological triad used to explain disease causation?

- A) Person, place, and time
- B) Agent, host, and environment
- C) Assessment, policy, and assurance
- D) Incidence, prevalence, and mortality

Answer Key

1. B — Epidemiology is defined as the study of the distribution and determinants of health-related states in populations and its application to control health problems.
2. C — Incidence counts new cases occurring in a population at risk during a given time period.
3. B — A cohort study tracks individuals forward from exposure to outcome to measure incidence and establish temporality.
4. B — The epidemiological triad explains disease causation through the interaction of agent, host, and environment.

Lesson 4: Fundamentals of Human Nutrition

1. How does the handout define a nutrient?

- A) Any indigestible plant fibre that aids gut movement
- B) A chemical substance in food that nourishes the body by providing energy, building materials, or factors that regulate body processes
- C) An organic catalyst synthesized exclusively by the human liver
- D) A synthetic chemical additive used in food manufacturing

2. According to the energy values listed in the handout, how much energy does 1 gram of fat yield?

- A) 4 kcal
- B) 7 kcal
- C) 9 kcal
- D) 12 kcal

3. How are essential nutrients defined in the handout?

- A) Nutrients required in large gram quantities per day
- B) Nutrients that the body cannot make (or not enough) and must come from food
- C) Nutrients that function solely as structural components
- D) Nutrients stored permanently in body tissue

4. According to the handout, where does carbohydrate digestion begin in the body?

- A) In the stomach with pepsin
- B) In the mouth with salivary amylase
- C) In the duodenum with bile
- D) In the jejunum with brush border enzymes

Answer Key

1. B — A nutrient is defined as a chemical substance in food providing energy, building materials, or regulatory factors to nourish the body.

2. C — Fat provides 9 kcal per gram, which is more than double the energy density of carbohydrates or proteins.
3. B — Essential nutrients cannot be synthesized by the body in sufficient amounts and must be obtained from food.
4. B — Carbohydrate digestion begins in the mouth through the action of salivary amylase.

Lesson 5: Macronutrients: Carbohydrates, Proteins and Fats

1. What is the role of the 9 essential amino acids in human nutrition?

- A) They can be synthesized by the human body from excess glucose
- B) They cannot be made by the body and must be obtained from food
- C) They are non-essential building blocks used solely for glycogen storage
- D) They function exclusively as fat-soluble vitamins in the liver

2. Which type of dietary fat is described as raising bad (LDL) cholesterol while lowering good cholesterol?

- A) Unsaturated fats
- B) Monounsaturated fatty acids
- C) Trans fats
- D) Omega-3 fatty acids

3. How does kwashiorkor differ primarily from marasmus according to the handout?

- A) Kwashiorkor is caused by severe energy deficiency without oedema
- B) Kwashiorkor results from severe protein deficiency with oedema present
- C) Kwashiorkor occurs only in adults over 50 years of age
- D) Kwashiorkor is caused by an excess of micronutrients

4. Which combination of plant foods provides a complete protein through mutual amino acid complementation?

- A) Rice and wheat
- B) Daal (lentils) and rice
- C) Ghee and butter
- D) Apples and mangoes

Answer Key

1. B — The 9 essential amino acids cannot be synthesized by the human body and must be provided through food.
2. C — Trans fats from hydrogenated oils raise harmful LDL cholesterol while lowering protective HDL cholesterol.
3. B — Kwashiorkor stems from severe protein deficiency accompanied by oedema, whereas marasmus involves overall severe energy wasting.
4. B — Combining legumes such as daal with grains like rice complements their respective amino acid profiles to form a complete protein.

Lesson 6: Micronutrients: Vitamins

1. Which group of vitamins is stored in body fat and the liver, posing a risk of toxicity if consumed in excess?

- A) Vitamins B1, B3, B9, and B12
- B) Vitamins A, D, E, and K
- C) Vitamin C and B-complex vitamins
- D) Vitamin C and Folic Acid

2. Which deficiency disease is matched correctly with Vitamin B3 (niacin) in the handout?

- A) Beriberi
- B) Scurvy
- C) Pellagra
- D) Rickets

3. Why is Vitamin B12 unique among the water-soluble vitamins regarding its dietary sources?

- A) It is synthesized directly by human skin under sunlight
- B) It is found naturally only in animal foods
- C) It is abundantly available in citrus fruits and leafy greens
- D) It is stored permanently in bone tissue

4. Which vitamin deficiency is highlighted as causing preventable childhood blindness (night blindness and xerophthalmia) in Pakistan?

- A) Vitamin D
- B) Vitamin C
- C) Vitamin A
- D) Vitamin K

Answer Key

1. B — Fat-soluble vitamins (A, D, E, and K) are stored in adipose tissue and the liver, so excessive intake can lead to toxicity.
2. C — Niacin (Vitamin B3) deficiency causes pellagra, which presents with the classic 3 Ds.
3. B — Vitamin B12 is unique among water-soluble vitamins because natural dietary sources are restricted strictly to animal products.
4. C — Vitamin A deficiency is a widespread public health issue in Pakistan that leads to night blindness and xerophthalmia in children.

Lesson 7: Micronutrients: Minerals and Water

1. Which mineral deficiency is identified as the most common nutritional disorder globally and in Pakistan?

- A) Calcium
- B) Iron
- C) Iodine
- D) Zinc

2. According to the handout, what effect does consuming tea with meals have on iron absorption from plant foods?

- A) It significantly increases iron absorption
- B) It converts non-heme iron into heme iron
- C) It reduces iron absorption
- D) It has no effect on iron absorption

3. Deficiency of which mineral leads to goitre and cretinism in children?

- A) Fluoride
- B) Sodium
- C) Iodine
- D) Potassium

4. What life-saving solution combines clean water with a precise salt-sugar mixture to treat diarrhoeal dehydration in children?

- A) Intravenous saline solution
- B) Oral rehydration salts (ORS)
- C) Ready-to-use therapeutic food (RUTF)
- D) Micronutrient powder solution

Answer Key

1. B — Iron deficiency anaemia is the most common nutritional disorder globally and in Pakistan, especially among women of reproductive age and children.
2. C — Tea taken with meals reduces iron absorption from plant foods.
3. C — Iodine deficiency impairs thyroid hormone synthesis, leading to goitre and cretinism in children.
4. B — Oral rehydration salts (ORS) consist of clean water and a precise salt-sugar mix that restores fluid balance during diarrhoea.

Lesson 8: Malnutrition: Undernutrition**1. How does the handout define malnutrition in all its forms?**

- A) Any disorder of nutritional status resulting from deficiency or excess of nutrients
- B) Exclusively as severe weight loss and muscle wasting in infants
- C) The presence of parasitic worm infections in the gastrointestinal tract
- D) Deficiency of fat-soluble vitamins resulting from inadequate lipid intake

2. Which clinical feature distinguishes kwashiorkor from marasmus in young children?

- A) Severe wasting ("skin and bones") without swelling
- B) Oedema (swelling) and loss of appetite
- C) Intense hunger and normal skin appearance
- D) Typical onset under 1 year of age without fluid retention

3. How is stunting distinguished from wasting in child health assessment?

- A) Stunting indicates acute food shortages, while wasting indicates chronic undernutrition
- B) Stunting measures low height for age (chronic), whereas wasting measures low weight for height (acute)
- C) Stunting measures low weight for height (acute), whereas wasting measures low height for age (chronic)
- D) Stunting is fully reversible after age 5, whereas wasting is untreatable

4. According to the handout, what is the critical window of opportunity to prevent childhood stunting?

- A) The first 100 days after birth
- B) The first 1,000 days (from conception to age 2)
- C) Adolescent growth spurt (ages 10 to 14)
- D) School-entry age (ages 5 to 6)

Answer Key

1. A — Malnutrition includes undernutrition, micronutrient deficiencies ("hidden hunger"), and overnutrition.
2. B — Kwashiorkor is characterized by severe protein deficiency presenting with oedema and loss of appetite, whereas marasmus involves overall severe energy wasting.
3. B — Stunting represents chronic undernutrition (low height for age), whereas wasting represents acute undernutrition (low weight for height).
4. B — The first 1,000 days (conception to age 2) decide lifelong health, after which stunting is largely irreversible.

Lesson 9: Overnutrition and Non-Communicable Diseases

1. How is the "nutrition transition" defined in the handout?

- A) The transition from acute undernutrition to chronic stunting in children
- B) The shift in populations from traditional diets and active lifestyles to processed, energy-dense diets and sedentary living
- C) The increase in micronutrient deficiencies due to soil depletion
- D) The transition from plant-based protein consumption to exclusive reliance on animal fats

2. According to the handout, what BMI range classifies an individual as "overweight"?

- A) BMI 18.5–24.9
- B) BMI 25–29.9
- C) BMI 30–34.9
- D) BMI 35 or above

3. Which body fat distribution pattern is highlighted as the most dangerous for heart disease and diabetes?

- A) Peripheral subcutaneous fat
- B) Upper arm fat accumulation
- C) Central (abdominal) obesity
- D) Lower limb fat deposition

4. What is the World Health Organization (WHO) target limit for daily salt intake to reduce blood pressure?

- A) Below 2 g per day
- B) Below 5 g per day
- C) Below 8 g per day
- D) Below 10 g per day

Answer Key

1. B — Nutrition transition is defined as the population shift from traditional diets and active living to processed, energy-dense diets and sedentary lifestyles.
2. B — An individual is classified as overweight with a BMI of 25–29.9, whereas a BMI of 30 or higher indicates obesity.
3. C — Central or abdominal obesity represents the most hazardous fat distribution pattern for developing diabetes and heart disease.
4. B — Reducing daily salt intake below 5 g per day is recommended to prevent and control hypertension.

Lesson 10: Maternal, Infant and Child Nutrition

1. What additional daily energy intake is recommended during pregnancy according to the handout?

- A) About +100 kcal/day
- B) About +300 kcal/day
- C) About +500 kcal/day
- D) About +750 kcal/day

2. Why is folate supplementation recommended before and during early pregnancy?

- A) To prevent dental caries in the mother
- B) To prevent neural tube defects in the fetus
- C) To increase maternal blood glucose concentration
- D) To treat maternal osteomalacia

3. What is the recommended duration for exclusive breastfeeding according to global guidelines in the handout?

- A) First 2 weeks
- B) First 3 months
- C) First 6 months
- D) First 12 months

4. When should complementary foods be introduced alongside continued breastfeeding?

- A) At 2 months of age
- B) At 4 months of age
- C) From 6 months of age
- D) Only after 12 months of age

Answer Key

1. B — Pregnancy requires an extra energy intake of about +300 kcal per day, along with increased iron, folate, and calcium.
2. B — Folate intake before conception and during early pregnancy prevents neural tube defects in the baby.
3. C — Exclusive breastfeeding—without water, formula, or traditional liquids—is recommended for the first 6 months of life.
4. C — Soft complementary foods should be introduced starting at 6 months while continuing breastfeeding up to 2 years of age.

Lesson 11: Food Safety, Hygiene and Sanitation

1. Which of the following is classified as a chemical hazard to food safety in the handout?

- A) Glass fragments and stones
- B) Salmonella and E. coli bacteria
- C) Pesticide residues and food adulterants
- D) Norovirus and intestinal parasites

2. According to the WHO "Five Keys to Safer Food," what is the recommended temperature for cooking food thoroughly?

- A) Above 50°C
- B) Above 60°C
- C) Above 70°C
- D) Above 100°C

3. What critical WASH practice is highlighted as the single cheapest lifesaver that cuts diarrhoea cases by about one third?

- A) Boiling water for 30 minutes
- B) Handwashing with soap at critical times
- C) Chemical fortification of street food
- D) Using industrial refrigeration units

4. According to the safe temperature rules in the handout, within what range should food NOT be kept to prevent bacterial growth?

- A) Between 5°C and 60°C
- B) Below 5°C
- C) Above 60°C
- D) Above 70°C

Answer Key

1. C — Pesticide residues and adulterants in milk or spices are classified as chemical hazards.
2. C — The WHO Five Keys to Safer Food recommend cooking food thoroughly to a temperature above 70°C.
3. B — Handwashing with soap at critical times reduces diarrhoea incidence by roughly one third.
4. A — Food should be kept below 5°C or above 60°C, leaving 5°C to 60°C as the dangerous temperature zone.

Lesson 12: Nutrition Assessment and Surveillance

1. In the ABCD approach to nutrition assessment, measuring haemoglobin levels or urinary iodine falls under which category?

- A) Anthropometric assessment
- B) Biochemical assessment
- C) Clinical assessment
- D) Dietary assessment

2. Which physical sign observed during a clinical nutrition assessment indicates an iodine deficiency?

- A) Pallor
- B) Oedema
- C) Goitre
- D) Night blindness

3. What Mid-Upper Arm Circumference (MUAC) measurement in a child under 5 years signals severe acute malnutrition (SAM)?

- A) Under 11.5 cm
- B) Between 12.5 cm and 13.5 cm
- C) Under 15.0 cm
- D) Between 15.5 cm and 17.0 cm

4. Which dietary assessment method involves asking an individual to report all foods and beverages consumed over the preceding day?

- A) Food frequency questionnaire
- B) 24-hour recall

- C) Anthropometric screening
- D) Sentinel surveillance survey

Answer Key

1. B — Biochemical assessment evaluates nutrient levels in body fluids, such as testing haemoglobin or urinary iodine.
2. C — Goitre is a clinical physical sign resulting from iodine deficiency.
3. A — A MUAC reading below 11.5 cm (115 mm) indicates severe acute malnutrition in young children.
4. B — The 24-hour recall is a dietary assessment method that evaluates recent food intake patterns.

Lesson 13: Public Health Nutrition Programs and Policy

1. Which strategy is described in the handout as the most cost-effective population-level intervention against hidden hunger?

- A) Specialized inpatient hospital care
- B) Individual clinical therapy
- C) Food fortification
- D) Private clinic consultations

2. Which staple food is fortified with iron and folic acid to help prevent anaemia and neural tube defects?

- A) Cooking oil
- B) Wheat flour
- C) Table salt
- D) Refined sugar

3. In Pakistan's public health system, which community healthcare workers deliver nutrition counselling, growth monitoring, and iron-folate supplements?

- A) Lady Health Workers (LHWs)
- B) Hospital Surgeons
- C) Food Safety Officers
- D) Laboratory Analysts

4. Which Sustainable Development Goal (SDG) explicitly focuses on achieving "Zero Hunger"?

- A) SDG 1
- B) SDG 2
- C) SDG 3
- D) SDG 6

Answer Key

1. C — Food fortification is identified as the most cost-effective population strategy against hidden hunger.
2. B — Wheat flour is fortified with iron and folic acid to combat anaemia and neural tube defects.
3. A — Lady Health Workers (LHWs) provide nutrition counselling, growth monitoring, and iron-folate at the community level.
4. B — SDG 2 targets "Zero Hunger", aligning with national public health nutrition policies.

End of Quiz

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