CUET PG 2026 Public Health Question Paper with Solutions(Memory Based)

Time Allowed :1 Hours 30 min	**Maximum Marks :**300	**Total Questions :**75

General Instructions

1. The exam lasts 90 minutes (1 hour 30 minutes).
2. There are 75 Multiple Choice Questions (MCQs) to be answered.
3. +4 marks for every correct answer. -1 mark (negative marking) for every incorrect answer. 0 marks for unanswered or un-attempted questions.
4. For any discrepancy in questions, the English version is considered final (except for language-specific papers).
5. Click one of the four options to choose an answer.
6. You must click "Save & Next" to confirm your response. Only saved answers are considered for evaluation.
7. Use "Mark for Review & Next" to flag a question for later. You can unselect or change your answer using the "Clear Response" button.
8. All calculations must be done on the Rough Sheets provided at the centre. These must be returned to the invigilator after the exam.

1. Which point mutation changes a codon but does not alter the resulting amino acid?

(A) Missense mutation
(B) Nonsense mutation
(C) Silent mutation
(D) Frameshift mutation

Correct Answer: (3) Silent mutation

Solution:

Concept: A point mutation is a change in a single nucleotide in the DNA sequence. Depending on its effect on the encoded protein, point mutations are classified as:

- Silent mutation: Changes the codon but not the amino acid due to redundancy of the genetic code.
- Missense mutation: Changes the codon, resulting in a different amino acid.
- Nonsense mutation: Converts a codon into a stop codon, terminating protein synthesis.
- Frameshift mutation: Caused by insertion/deletion, altering the reading frame.

The genetic code is degenerate, meaning multiple codons can code for the same amino acid.
Step 1: Understand codon redundancy.
For example, the codons UUU and UUC both code for phenylalanine. A mutation from UUU to UUC changes the codon but not the amino acid.
Step 2: Identify the mutation type.
Such mutations that do not affect the amino acid sequence are called silent mutations.
Step 3: Eliminate other options.

- Missense changes amino acid.
- Nonsense creates stop codon.
- Frameshift alters entire reading frame.

Step 4: Conclude the answer.
Thus, the correct answer is silent mutation.

Quick Tip

Silent mutation = **No change in protein**. Think: Different codon, same amino acid.

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2. What is the primary role of reverse transcriptase in recombinant DNA technology?
(A) To synthesize DNA from an RNA template
(B) To cut DNA at specific sites
(C) To join DNA fragments
(D) To amplify DNA sequences

Correct Answer: (1) To synthesize DNA from an RNA template

Solution:

Concept: Reverse transcriptase is an enzyme that synthesizes complementary DNA (cDNA) from an RNA template. It is naturally found in retroviruses and is widely used in molecular biology and recombinant DNA technology.

- It converts mRNA into cDNA.
- cDNA lacks introns, making it useful for cloning eukaryotic genes.

Step 1: Understand the function of reverse transcriptase.
Unlike normal transcription (DNA $\rightarrow$ RNA), reverse transcriptase works in the opposite direction (RNA $\rightarrow$ DNA).
Step 2: Identify its role in biotechnology.
It is used to generate cDNA libraries and clone genes from mRNA, especially when working with eukaryotic genes that contain introns.
Step 3: Differentiate from other enzymes.

- Restriction enzymes cut DNA.
- DNA ligase joins DNA fragments.
- DNA polymerase amplifies DNA (PCR).

Step 4: Conclude the answer.
Thus, the primary role of reverse transcriptase is to synthesize DNA from an RNA template.

Quick Tip

Reverse transcriptase = **RNA** $\rightarrow$ **DNA**. Opposite of normal transcription.

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3. Which enzyme is responsible for relieving supercoiling during DNA replication?
(A) DNA ligase
(B) Helicase
(C) Topoisomerase
(D) Primase

Correct Answer: (3) Topoisomerase

Solution:

Concept: During DNA replication, the double helix must unwind to allow replication machinery to access the strands. This unwinding creates torsional strain ahead of the replication fork, leading to supercoiling of DNA.
Different enzymes involved in DNA replication have specific roles:

- Helicase: Unwinds the DNA double helix.
- Topoisomerase: Relieves supercoiling by cutting and rejoining DNA strands.
- Primase: Synthesizes RNA primers.
- DNA ligase: Joins Okazaki fragments.

Step 1: Understand the problem of supercoiling.
As helicase unwinds DNA, the region ahead becomes overwound, creating tension and supercoils.
Step 2: Identify the enzyme that resolves this tension.
Topoisomerase cuts one or both strands of DNA, allowing it to rotate and relieve the stress, then reseals the strands.
Step 3: Differentiate from other enzymes.

- Helicase unwinds but does not relieve supercoiling.
- Ligase joins DNA fragments.
- Primase initiates synthesis.

Step 4: Conclude the answer.
Thus, topoisomerase is responsible for relieving supercoiling during DNA replication.

Quick Tip

Topoisomerase = **Tension remover**. Cuts, relaxes, and rejoins DNA to prevent supercoiling.

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4. According to WHO, what is the BMI (Body Mass Index) classification range for a "pre-obese" individual?
(A) 18.5 – 24.9
(B) 25.0 – 29.9
(C) 30.0 – 34.9
(D) 35.0 – 39.9

Correct Answer: (2) 25.0 – 29.9

Solution:

Concept: Body Mass Index (BMI) is a measure used to classify individuals based on body weight relative to height. It is defined as:

$$\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height (m)}^2}$$

According to the World Health Organization (WHO), BMI categories are:

- Underweight: < 18.5
- Normal weight: 18.5 – 24.9
- Pre-obese (Overweight): 25.0 – 29.9
- Obese Class I: 30.0 – 34.9
- Obese Class II: 35.0 – 39.9
- Obese Class III: ≥ 40.0

Step 1: Understand the classification system.
WHO provides standard BMI ranges to assess health risks associated with body weight.
Step 2: Identify the "pre-obese" category.
The pre-obese category corresponds to individuals who are overweight but not yet in the obese range.
Step 3: Match with the correct range.
The BMI range for pre-obese individuals is 25.0 to 29.9.
Step 4: Conclude the answer.
Thus, the correct answer is 25.0 – 29.9.

Quick Tip

BMI 25–29.9 = **Pre-obese (Overweight)**. Above 30 = Obese category.

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5. In the Integrated Management of Neonatal and Childhood Illness (IMNCI), what is the respiration rate threshold for "fast breathing" in a child aged 12 months to 5 years?
(A) $\geq$ 40 breaths per minute
(B) $\geq$ 50 breaths per minute
(C) $\geq$ 60 breaths per minute
(D) $\geq$ 70 breaths per minute

Correct Answer: (1) $\geq$ 40 breaths per minute

Solution:

Concept: The Integrated Management of Neonatal and Childhood Illness (IMNCI) provides standardized guidelines to assess and manage common childhood illnesses, including pneumonia. One of the key diagnostic indicators is the respiratory rate.
The threshold for "fast breathing" varies with age:

- $<$ 2 months: $\geq$ 60 breaths/min
- 2 months – 12 months: $\geq$ 50 breaths/min
- 12 months – 5 years: $\geq$ 40 breaths/min

Step 1: Identify the age group.
The child falls in the 12 months to 5 years category.
Step 2: Recall the IMNCI threshold.
For this age group, fast breathing is defined as a respiratory rate of 40 or more breaths per minute.
Step 3: Select the correct option.
Thus, the correct threshold is $\geq$ 40 breaths per minute.

Quick Tip

IMNCI breathing cutoffs: $<$2 months $\rightarrow$ 60, 2–12 months $\rightarrow$ 50, 1–5 years $\rightarrow$ **40**.

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6. Which type of immunity is acquired through the administration of a vaccine?
(A) Natural active immunity
(B) Natural passive immunity
(C) Artificial active immunity
(D) Artificial passive immunity

Correct Answer: (3) Artificial active immunity

Solution:

Concept: Immunity is the body's ability to resist infections. It is broadly classified into active and passive immunity, each of which can be natural or artificial:

- Natural active immunity: Acquired through natural infection.
- Natural passive immunity: Transfer of antibodies from mother to child (e.g., placenta, breast milk).
- Artificial active immunity: Induced by vaccines.
- Artificial passive immunity: Injection of pre-formed antibodies (e.g., antiserum).

Vaccines contain weakened or inactivated pathogens (or their components) that stimulate the immune system to produce antibodies and memory cells.
Step 1: Understand how vaccines work.
Vaccines trigger the body's immune response without causing disease, leading to the formation of memory cells.
Step 2: Identify the type of immunity.
Since immunity is developed actively by the body and is artificially induced, it is classified as artificial active immunity.
Step 3: Differentiate from other types.

- Passive immunity involves receiving ready-made antibodies.
- Natural immunity occurs without medical intervention.

Step 4: Conclude the answer.
Thus, immunity acquired through vaccination is artificial active immunity.

Quick Tip

Vaccination = **Artificial + Active**. Body produces its own antibodies after exposure.

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7. According to the National Immunization Schedule, which types of poliovirus are contained in the Oral Polio Vaccine (OPV)?
(A) Type 1 only
(B) Type 1 and Type 2
(C) Type 1 and Type 3
(D) Type 1, Type 2, and Type 3

Correct Answer: (3) Type 1 and Type 3

Solution:

Concept: Oral Polio Vaccine (OPV) is a live attenuated vaccine used to protect against poliomyelitis. Poliovirus has three serotypes: Type 1, Type 2, and Type 3.

Historically, trivalent OPV (tOPV) contained all three types. However, after the global eradication of wild poliovirus Type 2, the vaccine was modified to bivalent OPV (bOPV), which contains only:

- Type 1 poliovirus
- Type 3 poliovirus

This change reduces the risk associated with vaccine-derived poliovirus Type 2.
Step 1: Understand the evolution of OPV.
Earlier vaccines included all three types, but current immunization schedules use bOPV.
Step 2: Identify the included types.
The present OPV contains Type 1 and Type 3 poliovirus strains.
Step 3: Eliminate incorrect options.
Options including Type 2 are outdated in the current schedule.
Step 4: Conclude the answer.
Thus, OPV contains Type 1 and Type 3 poliovirus.

Quick Tip

Current OPV = **bOPV** (Type 1 + Type 3). Type 2 removed after eradication.

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8. "Koplik's spots" on the oral mucosa are a pathognomonic sign of which infectious disease?
(A) Rubella
(B) Measles
(C) Chickenpox
(D) Scarlet fever

Correct Answer: (2) Measles

Solution:

Concept: Koplik's spots are small bluish-white spots with a red halo seen on the buccal mucosa (inside the cheeks). They are considered pathognomonic, meaning they are specifically characteristic of a particular disease.

- Measles (Rubeola): Presence of Koplik's spots before the skin rash appears.
- Rubella: Mild rash, no Koplik's spots.
- Chickenpox: Vesicular rash ("dew drops on a rose petal").
- Scarlet fever: Strawberry tongue and rash.

Step 1: Identify the clinical sign.
Koplik's spots appear in the early stage of infection on the oral mucosa.
Step 2: Associate with the disease.
These spots are uniquely associated with measles and appear before the characteristic maculopapular rash.

Step 3: Differentiate from other diseases.
Other infectious diseases may have oral or skin manifestations, but none show Koplik's spots.
Step 4: Conclude the answer.
Thus, Koplik's spots are a pathognomonic sign of measles.

Quick Tip

Koplik's spots = **Measles hallmark**. Seen before rash → helps early diagnosis.

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9. Which study design is considered the "gold standard" for developing and testing a new vaccine?
(A) Cohort study
(B) Case-control study
(C) Randomized Controlled Trial (RCT)
(D) Cross-sectional study

Correct Answer: (3) Randomized Controlled Trial (RCT)

Solution:

Concept: Different epidemiological study designs are used to investigate diseases and interventions. Among them, the Randomized Controlled Trial (RCT) is considered the gold standard for evaluating the efficacy and safety of new interventions, including vaccines.

- Cohort study: Observational, follows groups over time.
- Case-control study: Retrospective comparison of cases and controls.
- Cross-sectional study: Snapshot at a single point in time.
- Randomized Controlled Trial: Experimental study with random allocation.

Step 1: Understand requirements for vaccine testing.
Testing a vaccine requires minimizing bias and establishing a clear cause-effect relationship.
Step 2: Identify the most reliable design.
RCTs randomly assign participants into intervention (vaccine) and control (placebo) groups, ensuring comparability.
Step 3: Advantages of RCT.

- Minimizes selection bias
- Allows causal inference
- Provides high-quality evidence

Step 4: Conclude the answer.
Thus, the gold standard study design for vaccine development is the Randomized Controlled Trial.

Quick Tip

RCT = **Gold standard** (Random + Control + Comparison = Best evidence)

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10. What happens to the prevalence of a disease if the duration of the illness increases while incidence remains constant?
(A) Decreases
(B) Remains unchanged
(C) Increases
(D) Becomes zero

Correct Answer: (3) Increases

Solution:

Concept: Prevalence refers to the total number of existing cases of a disease in a population at a given time, while incidence refers to the number of new cases occurring over a period. They are related by the formula:

$$\text{Prevalence} = \text{Incidence} \times \text{Duration of disease}$$

Step 1: Understand the relationship.
Prevalence depends directly on both incidence and duration.
Step 2: Analyze the given condition.
If incidence remains constant and duration increases, the product (incidence $\times$ duration) increases.
Step 3: Interpret the result.
An increase in duration means patients live longer with the disease, leading to accumulation of cases.
Step 4: Conclude the answer.
Thus, prevalence increases.

Quick Tip

Prevalence $\propto$ Duration. Longer disease duration $\Rightarrow$ More existing cases.

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11. Which statistical test is most appropriate for comparing the mean hemoglobin levels between two independent groups?
(A) Paired t-test
(B) Chi-square test
(C) Independent t-test
(D) ANOVA

Correct Answer: (3) Independent t-test

Solution:

Concept: Statistical tests are chosen based on the type of data and study design. When comparing means between groups, parametric tests like the t-test or ANOVA are commonly used.

- Independent t-test: Compares means of two independent groups.
- Paired t-test: Compares means of the same group at two different times.
- ANOVA: Compares means of more than two groups.
- Chi-square test: Used for categorical data, not means.

Step 1: Identify the type of data.
Hemoglobin level is a continuous variable.
Step 2: Determine the number and type of groups.
The question specifies two independent groups.
Step 3: Select the appropriate test.
The independent (unpaired) t-test is used to compare the means of two independent groups.
Step 4: Eliminate incorrect options.

- Paired t-test is for related samples.
- ANOVA is for more than two groups.
- Chi-square is for categorical variables.

Step 5: Conclude the answer.
Thus, the correct test is the independent t-test.

Quick Tip

2 groups (independent) $\rightarrow$ **Independent t-test** Same group (before-after) $\rightarrow$ Paired t-test

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12. Which Indian legislative act provides social security measures specifically for industrial workers regarding maternity benefits?
(A) Factories Act, 1948
(B) Employees' State Insurance Act, 1948
(C) Maternity Benefit Act, 1961
(D) Minimum Wages Act, 1948

Correct Answer: (2) Employees' State Insurance Act, 1948

Solution:

Concept: Various legislative acts in India provide social security and welfare benefits to workers. These include provisions related to health, maternity, wages, and working conditions.

- Employees' State Insurance (ESI) Act, 1948: Provides medical care and cash benefits including maternity benefits for industrial workers.
- Maternity Benefit Act, 1961: Provides maternity leave and benefits, mainly for women not covered under ESI.
- Factories Act, 1948: Regulates working conditions in factories.
- Minimum Wages Act, 1948: Ensures minimum wage standards.

Step 1: Focus on "industrial workers".
The question specifically refers to workers in industrial settings.
Step 2: Identify the act covering such workers.
The ESI Act, 1948 provides comprehensive social security, including maternity benefits, specifically for employees in factories and establishments.
Step 3: Differentiate from similar act.
The Maternity Benefit Act applies to women not covered under ESI, whereas ESI is targeted at industrial workers.
Step 4: Conclude the answer.
Thus, the correct answer is Employees' State Insurance Act, 1948.

Quick Tip

Industrial workers → **ESI Act, 1948** Non-ESI women → Maternity Benefit Act, 1961

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13. What is the commonest type of cancer among males in India?
(A) Lung cancer
(B) Oral cancer
(C) Prostate cancer
(D) Stomach cancer

Correct Answer: (2) Oral cancer

Solution:

Concept: The pattern of cancer incidence varies by region due to lifestyle, environmental, and genetic factors. In India, tobacco consumption (both smoking and smokeless forms like gutka and paan) is highly prevalent and is a major risk factor for oral cancers.

- Oral cancer: Most common in Indian males due to tobacco chewing and smoking.
- Lung cancer: Common globally but second to oral cancer in India.
- Prostate cancer: More common in Western countries.
- Stomach cancer: Less common compared to oral cancer in India.

Step 1: Consider major risk factors in India.
High prevalence of tobacco chewing significantly increases oral cancer incidence.

Step 2: Identify the most common cancer.
Epidemiological data from India consistently shows oral cancer as the leading cancer among males.
Step 3: Eliminate other options.
While lung and prostate cancers are important, they are not the most common in Indian males.
Step 4: Conclude the answer.
Thus, the commonest cancer among males in India is oral cancer.

Quick Tip

India + Tobacco chewing → **Oral cancer (most common in males)**.

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14. Which type of "blinding" is most commonly utilized in Randomized Controlled Trials (RCTs) to reduce bias?
(A) Single-blind
(B) Double-blind
(C) Triple-blind
(D) Open-label

Correct Answer: (2) Double-blind

Solution:

Concept: Blinding (masking) in clinical trials is used to reduce bias by preventing participants and/or investigators from knowing which intervention is being administered.

- Single-blind: Only the participant is unaware.
- Double-blind: Both participant and investigator are unaware.
- Triple-blind: Participant, investigator, and data analyst are unaware.
- Open-label: No blinding.

Step 1: Understand purpose of blinding.
Blinding minimizes bias in outcome assessment, placebo effect, and treatment administration.
Step 2: Identify the most commonly used type.
Double-blind trials are most widely used because they effectively reduce both participant and observer bias.
Step 3: Compare with other types.

- Single-blind reduces only participant bias.
- Triple-blind is more rigorous but less commonly used.
- Open-label has no bias control.

Step 4: Conclude the answer.
Thus, the most commonly utilized blinding method in RCTs is double-blind.

Quick Tip

Double-blind = **Participant + Investigator unaware** ⇒ Best balance of practicality and bias control.

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15. Which nutrient deficiency is the primary cause of "hidden hunger" in a population?
(A) Protein deficiency
(B) Carbohydrate deficiency
(C) Micronutrient deficiency
(D) Fat deficiency

Correct Answer: (3) Micronutrient deficiency

Solution:

Concept: "Hidden hunger" refers to a form of malnutrition where individuals consume enough calories but lack essential vitamins and minerals (micronutrients). It is called "hidden" because the deficiency is not always visibly apparent like severe undernutrition.
Key micronutrients involved include:

- Iron (deficiency leads to anemia)
- Vitamin A (deficiency causes night blindness)
- Iodine (deficiency causes goiter and developmental issues)
- Zinc (affects immunity and growth)

Step 1: Understand the term "hidden hunger".
It is not due to lack of calories (macronutrients), but due to lack of essential micronutrients.
Step 2: Differentiate from other deficiencies.

- Protein deficiency leads to conditions like kwashiorkor.
- Carbohydrate and fat deficiencies lead to energy deficiency.

Step 3: Identify the correct cause.
Hidden hunger is primarily caused by micronutrient deficiency.
Step 4: Conclude the answer.
Thus, the correct answer is micronutrient deficiency.

Quick Tip

Hidden hunger = **Micronutrient deficiency** Calories adequate but vitamins/minerals lacking.

16. What are the four components of the WHO health system building blocks?
(A) Service delivery, Health workforce, Health information systems, Access to essential medicines
(B) Financing, Governance, Infrastructure, Technology
(C) Nutrition, Sanitation, Education, Immunization
(D) Prevention, Treatment, Rehabilitation, Research

Correct Answer: (1) Service delivery, Health workforce, Health information systems, Access to essential medicines

Solution:

Concept: The World Health Organization (WHO) framework for health systems strengthening identifies six building blocks, out of which key core components are often emphasized in subsets. These building blocks aim to improve health system performance in terms of access, quality, and efficiency.
The major WHO health system building blocks include:

- Service delivery
- Health workforce
- Health information systems
- Access to essential medicines
- Health financing
- Leadership/governance

Step 1: Understand the WHO framework.
WHO defines a structured approach to strengthen healthcare systems globally.
Step 2: Identify the commonly grouped core components.
Among the options, the first option correctly lists four fundamental operational components of the system.
Step 3: Eliminate incorrect options.
Other options either include unrelated elements or are incomplete/misclassified.
Step 4: Conclude the answer.
Thus, the correct set is: service delivery, health workforce, health information systems, and access to essential medicines.

Quick Tip

WHO system = 6 blocks (remember core 4 easily): **Service + Workforce + Information + Medicines**.