INI CET Community Medicine

Sample Paper – 1

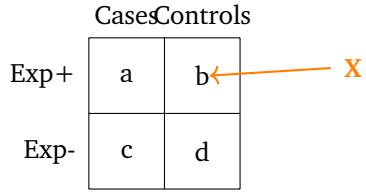
Duration: 14 Minutes **Maximum Marks: 15**

Instructions

- This paper contains **15** Multiple Choice Questions (Single Best Response), modelled on the Community Medicine (Preventive and Social Medicine) content of **INI CET** (Institutes of National Importance Combined Entrance Test) conducted by AIIMS New Delhi.
- The **15-question** length matches the number of Community Medicine items you actually meet in the real 200-question paper.
- Each correct answer carries **+1 mark**. There is **negative marking of one-third (0.33) mark** for every incorrect answer; unattempted questions carry no penalty.
- Every question has **exactly one best answer**. Choose the single most appropriate option.
- Attempt this practice paper in one timed sitting of about **14 minutes**, the pace the real computer-based test demands.

Epidemiology and Biostatistics

Q1. In the 2x2 table for a case-control study shown, the appropriate measure of association (marked **X**, computed as ad/bc) is the:



(A) Relative risk

(B) Odds ratio

(C) Attributable risk

(D) Prevalence ratio

Q2. Which study design is regarded as the gold standard for establishing a cause-effect relationship because randomisation balances confounders?

(A) Case-control study

(B) Cross-sectional survey

(C) Ecological (correlational) study

(D) Randomised controlled trial

Q3. A study that begins with a group of exposed and non-exposed people and follows them forward in time to record who develops the disease is a:

(A) Prospective cohort study

(B) Case-control study

(C) Retrospective case-control study

(D) Cross-sectional survey

Communicable Diseases

Q4. Pulmonary tuberculosis is transmitted from person to person mainly through:

(A) Contaminated drinking water

(B) Airborne droplet nuclei

(C) The bite of an infected mosquito

(D) Blood transfusion

Q5. Under the National Tuberculosis Elimination Programme (NTEP), the recommended initial diagnostic test that also detects rifampicin resistance is:

(A) CBNAAT (cartridge-based nucleic acid amplification test)

(B) Sputum smear (Ziehl-Neelsen) microscopy

(C) The Mantoux tuberculin skin test

(D) Plain chest radiograph

Q6. Under the NTEP, the standard first-line regimen for a new drug-sensitive case of tuberculosis is given for a total minimum duration of:

(A) 2 months

(B) 4 months

(C) 6 months

(D) 12 months

Non-communicable Diseases and Nutrition

Q7. Bilateral pitting pedal oedema in a young child, together with a fatty enlarged liver and dyspigmented "flag-sign" hair, is the hallmark of:

(A) Kwashiorkor

(B) Marasmus

(C) Nutritional dwarfism

(D) Vitamin A deficiency

Q8. Severe generalised wasting with near-total loss of subcutaneous fat giving a shrunken "old man's" facies, and with NO oedema, is characteristic of:

(A) Kwashiorkor

(B) Marasmic-kwashiorkor

(C) Nutritional oedema

(D) Marasmus

Maternal, Child Health and Family Planning

Q9. Under the National Immunization Schedule of the Universal Immunization Programme, BCG, the birth dose of oral polio vaccine (OPV-0) and the Hepatitis B birth dose are given:

(A) At 6 weeks of age

(B) At birth

(C) At 9 completed months

(D) At 10 weeks of age

Q10. Under the National Immunization Schedule, the first dose of the measles-containing vaccine (MR) is scheduled at:

(A) 9 completed months

(B) At birth

(C) 6 weeks

(D) 5 years

Q11. Under the Universal Immunization Programme, the pentavalent vaccine (DPT-HepB-Hib) primary series is given at 6, 10 and 14 weeks. The FIRST pentavalent dose is therefore due at:

(A) At birth

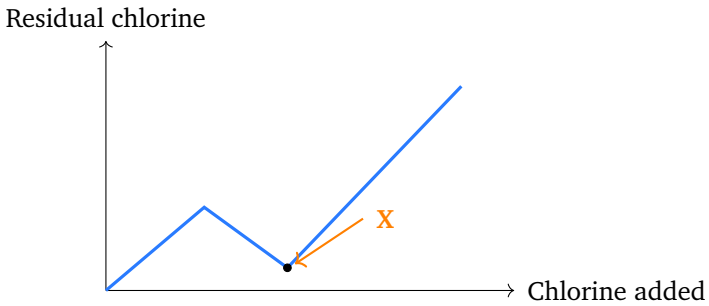
(B) 9 months

(C) 6 weeks

(D) 16 to 24 months

Environmental and Occupational Health

Q12. In the break-point chlorination curve shown, the trough marked **X**, where combined chlorine (chloramines) has just been destroyed and free residual chlorine begins to appear, is called the:



(A) Chlorine demand point

(B) Saturation point

(C) Break point

(D) Super-chlorination point

Q13. For water to be considered safe, the minimum FREE residual chlorine that should remain after a contact period of about one hour is:

(A) 0.1 mg per litre

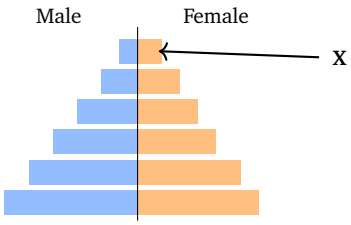
(B) 0.5 mg per litre

(C) 1.0 mg per litre

(D) 2.0 mg per litre

Health Programmes, Demography and Health Systems

Q14. The population pyramid shown (marked **X**), with a very broad base that tapers rapidly toward the apex, represents which type of population?



(A) Stationary population

(B) Declining population

(C) Ageing population

(D) Expanding (young) population

Q15. In the demographic cycle, the stage in which the birth rate remains high while the death rate falls rapidly, producing a population explosion, is the:

(A) High stationary stage

(B) Late expanding stage

(C) Early expanding stage

(D) Low stationary stage

Detailed Solutions

Q1.

Solution

Concept – measure of association by design: The design decides which measure you can calculate.

Step 1 – read the table: The cells are a and b in the exposed row, c and d in the unexposed row, with cases and controls forming the columns.

Step 2 – apply to a case-control study: Here subjects are chosen by disease status, so incidence cannot be measured. The valid measure is the **odds ratio**, calculated as (a $\times$ d) / (b $\times$ c), exactly the ad/bc marked as X.

Why the other options are wrong:

- A, relative risk: needs incidence, so it belongs to a cohort study, not a case-control study.
- C, attributable risk: also needs incidence in exposed and unexposed groups.
- D, prevalence ratio: is a cross-sectional measure, not ad/bc.

Final Answer: Odds ratio $\Rightarrow$ B

Answer: (B) Go Back to Q1

Q2.

Solution

Concept – hierarchy of evidence: Designs differ in how well they prove causation.

Step 1 – name the gold standard: The **randomised controlled trial (RCT)** is the strongest single design because random allocation distributes known and unknown confounders equally between the groups.

Step 2 – why it proves causation: Randomisation plus a planned intervention lets the investigator attribute any difference in outcome to the intervention itself.

Why the other options are wrong:

- A, case-control: observational and prone to recall and selection bias.
- B, cross-sectional survey: measures exposure and disease at one point, so it cannot show temporal sequence.
- C, ecological study: uses group-level data and risks the ecological fallacy.

Final Answer: Randomised controlled trial ⇒ D

Answer: (D) Go Back to Q2

Q3.

Solution

Concept – direction of enquiry: A study is named by where it starts and which way it moves in time.

Step 1 – trace the design: It starts from exposure status and follows people forward until disease appears. This is a **prospective cohort study**.

Step 2 – what it yields: Because it measures new (incident) cases in exposed and unexposed groups, it can give incidence and relative risk.

Why the other options are wrong:

- B, case-control: starts from disease status and looks backward for exposure.
- C, retrospective case-control: again begins with outcome, not exposure.
- D, cross-sectional survey: measures exposure and disease together at a single time, with no follow-up.

Final Answer: Prospective cohort study ⇒ A

Answer: (A) Go Back to Q3

Q4.

Solution

Concept – route of TB spread: The mode of transmission decides the control strategy.

Step 1 – name the route: Tuberculosis spreads by **airborne droplet nuclei** that a smear-positive patient releases while coughing, sneezing or speaking.

Step 2 – why it matters: Because the tiny nuclei stay suspended in air, ventilation and covering the cough are central to control.

Why the other options are wrong:

- A, contaminated water: is the faeco-oral route (cholera, typhoid), not TB.
- C, mosquito bite: spreads vector-borne diseases such as malaria and dengue.
- D, blood transfusion: transmits blood-borne agents such as HIV and hepatitis B, not TB.

Final Answer: Airborne droplet nuclei $\Rightarrow$ B

Answer: (B) Go Back to Q4

Q5.

Solution

Concept – upfront molecular diagnosis: NTEP now favours a rapid test that also flags drug resistance.

Step 1 – name the test: CBNAAT (cartridge-based nucleic acid amplification test, for example GeneXpert) is the recommended initial test. It detects Mycobacterium tuberculosis DNA and simultaneously reports rifampicin resistance.

Step 2 – programmatic value: A positive result within about two hours lets treatment and drug-resistance decisions start on the same day.

Why the other options are wrong:

- B, smear microscopy: cheap but less sensitive and gives no resistance information.
- C, Mantoux test: indicates infection or exposure, not active disease.
- D, chest radiograph: is only a supportive, non-specific tool.

Final Answer: CBNAAT $\Rightarrow$ A

Answer: (A) Go Back to Q5

Q6.

Solution

Concept – length of first-line therapy: Drug-sensitive TB needs a fixed minimum course.

Step 1 – state the duration: A new drug-sensitive case is treated for a total of **6 months**: an intensive phase of 2 months (isoniazid, rifampicin, pyrazinamide, ethambutol) followed by a continuation phase of 4 months (isoniazid, rifampicin, ethambutol).

Step 2 – why not shorter: A full 6 months is needed to kill slowly dividing and dormant bacilli and to prevent relapse and resistance.

Why the other options are wrong:

- A, 2 months: is only the intensive phase.

- B, 4 months: is only the continuation phase.
- D, 12 months: is far longer than the standard drug-sensitive course.

Final Answer: 6 months ⇒ C

Answer: (C) Go Back to Q6

Q7.

Solution

Concept – forms of protein-energy malnutrition: Oedema is the dividing feature.

Step 1 – read the clues: Pitting pedal oedema, a fatty enlarged liver and dyspigmented flag-sign hair point to **kwashiorkor**, the oedematous form driven mainly by protein deficiency.

Step 2 – mechanism: Low serum albumin lowers plasma oncotic pressure, so fluid leaks into tissues and causes the oedema.

Why the other options are wrong:

- B, marasmus: shows severe wasting but no oedema and no fatty liver.
- C, nutritional dwarfism: is stunting from long-standing deficiency, without acute oedema.
- D, vitamin A deficiency: causes eye signs such as night blindness, not pedal oedema.

Final Answer: Kwashiorkor ⇒ A

Answer: (A) Go Back to Q7

Q8.

Solution

Concept – the non-oedematous form: Wasting without oedema names the condition.

Step 1 – match the picture: Extreme wasting with loss of subcutaneous fat, an "old man's" face and NO oedema is **marasmus**, driven by a severe deficit of total energy.

Step 2 – contrast with kwashiorkor: Marasmus has no oedema and no fatty liver, whereas kwashiorkor is defined by oedema.

Why the other options are wrong:

- A, kwashiorkor: is oedematous, the opposite of the stem.
- B, marasmic-kwashiorkor: is a mixed form that includes oedema.
- C, nutritional oedema: implies oedema, which the stem explicitly excludes.

Final Answer: Marasmus $\Rightarrow$ D

Answer: (D) Go Back to Q8

Q9.

Solution

Concept – birth-time vaccines: Some doses are given as early as possible.

Step 1 – state the schedule: Under the National Immunization Schedule, BCG, OPV-0 and the Hepatitis B birth dose are all given **at birth** (within the first days of life).

Step 2 – reason: Early BCG protects against severe childhood TB, and an early Hepatitis B dose prevents mother-to-child transmission.

Why the other options are wrong:

- A and D, 6 weeks and 10 weeks: are pentavalent, OPV and other primary-series times.
- C, 9 completed months: is the time for the first measles-containing (MR) dose.

Final Answer: At birth $\Rightarrow$ B

Answer: (B) Go Back to Q9

Q10.

Solution

Concept – timing of the measles dose: Maternal antibody wanes by about nine months.

Step 1 – state the age: The first measles-containing (MR) dose is given at **9 completed months** (it may be given up to 12 months if missed).

Step 2 – why nine months: By this age protective maternal antibody has fallen enough for the child's own immune response to the vaccine to take hold.

Why the other options are wrong:

- B, at birth: is for BCG, OPV-0 and Hepatitis B, not measles.
- C, 6 weeks: is the first pentavalent and OPV-1 dose.
- D, 5 years: is a booster time (DPT), not the first measles dose.

Final Answer: 9 completed months $\Rightarrow$ A

Answer: (A) Go Back to Q10

Q11.

Solution

Concept – the primary series: Pentavalent is given three times in infancy.

Step 1 – state the first dose: The pentavalent series (DPT-HepB-Hib) is scheduled at 6, 10 and 14 weeks, so the FIRST dose is due at **6 weeks**.

Step 2 – why start at six weeks: This is the earliest age at which the primary series reliably raises protective antibody against diphtheria, pertussis, tetanus, hepatitis B and Hib.

Why the other options are wrong:

- A, at birth: is for BCG, OPV-0 and Hepatitis B birth dose.
- B, 9 months: is the first measles (MR) dose.
- D, 16 to 24 months: is the time for boosters (DPT, OPV and MR-2), not the first pentavalent dose.

Final Answer: 6 weeks $\Rightarrow$ C

Answer: (C) Go Back to Q11

Q12.

Solution

Concept – break-point chlorination: Added chlorine first satisfies demand before free chlorine appears.

Step 1 – read the curve: As chlorine is added, residual chlorine rises, then falls to a trough as chloramines are oxidised and destroyed. That lowest point, marked X, is the **break point**.

Step 2 – what follows: Beyond the break point, any further chlorine added stays as free residual chlorine, so the curve rises steadily again.

Why the other options are wrong:

- A, chlorine demand point: describes the total demand satisfied, not the labelled trough.
- B, saturation point: is not the recognised term for this trough.
- D, super-chlorination point: refers to adding chlorine well beyond the break point, on the rising limb.

Final Answer: Break point ⇒ C

Answer: (C) Go Back to Q12

Q13.

Solution

Concept – free residual chlorine standard: A safety margin must remain after disinfection.

Step 1 – state the value: A minimum free residual chlorine of **0.5 mg per litre** should remain after a contact period of about one hour to ensure the water is safe.

Step 2 – why keep a residual: The residual guards against any re-contamination in the distribution system after treatment.

Why the other options are wrong:

- A, 0.1 mg per litre: is too low to guarantee continued disinfection.
- C, 1.0 mg per litre and D, 2.0 mg per litre: are higher than the required minimum and can cause taste and odour problems.

Final Answer: 0.5 mg per litre ⇒ B

Answer: (B) Go Back to Q13

Q14.

Solution

Concept – shape of the population pyramid: The outline tells you the population type.

Step 1 – read the shape: A very broad base tapering rapidly to a narrow apex means many children and few elderly. This is an **expanding (young) population**, typical of high birth and death rates.

Step 2 – what it implies: Such a pyramid signals rapid growth and a high depen-

dency load of children, common in developing settings.

Why the other options are wrong:

- A, stationary population: has a bell or beehive shape with nearly straight sides.
- B, declining population: has a narrow base wider in the middle.
- C, ageing population: shows a bulge at the older age groups, not a broad base.

Final Answer: Expanding (young) population $\Rightarrow$ D

Answer: (D) Go Back to Q14

Q15.

Solution

Concept – the demographic cycle: Five stages describe the transition from high to low vital rates.

Step 1 – match the description: High birth rate with a rapidly falling death rate, causing a population explosion, defines the **early expanding stage**.

Step 2 – placing it in the cycle: It follows the high stationary stage (both rates high) and precedes the late expanding stage (birth rate now also falling).

Why the other options are wrong:

- A, high stationary: both birth and death rates are high, so growth is slow.
- B, late expanding: the birth rate has started to fall while the death rate is low.
- D, low stationary: both rates are low and growth is near zero.

Final Answer: Early expanding stage $\Rightarrow$ C

Answer: (C) Go Back to Q15

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	D	3	A	4	B	5	A
6	C	7	A	8	D	9	B	10	A
11	C	12	C	13	B	14	D	15	C