## Given Question:

**Given questions** for the requested demographic measures:

1. **Doubling Time:**
   *If a population has a Rate of Natural Increase (RNI) of 2%, how many years will it take for the population to double? (Use the Rule of 70: Doubling Time = 70 / RNI)*
2. **Crude Density (Arithmetic Density):**
   *A country has a total population of 5,000,000 and a total land area of 50,000 square kilometers. What is the Crude Density (Arithmetic Density) in persons per square kilometer?*
3. **Agricultural Density (Rural Density):**
   *If a country has a total rural population of 2,000,000 and an agricultural land area of 40,000 square kilometers, what is the Agricultural Density (Rural Density) in persons per square kilometer of arable land?*
4. **Rate of Natural Increase (RNI):**
   *Given that the Crude Birth Rate (CBR) is 25 per 1,000 population and the Crude Death Rate (CDR) is 10 per 1,000 population, what is the Rate of Natural Increase (RNI) per 1,000 population?*
5. **Crude Birth Rate (CBR):**
   *If a country records 300,000 live births in a year and has a total midyear population of 15,000,000, what is the Crude Birth Rate (CBR) per 1,000 population?*
6. **General Fertility Rate (GFR):**
   *If a population has 150,000 annual live births and 1,200,000 women aged 15–49, what is the General Fertility Rate (GFR) per 1,000 women aged 15–49?*

**Answer**

1. **Doubling Time:**
   - Formula: **Doubling Time = 70 / Rate of Natural Increase (RNI)**
   - Given: RNI = **2%**
   - Computed Answer: **35 years**
2. **Crude Density (Arithmetic Density):**
   - Formula: **Crude Density = Total Population / Total Land Area**
   - Given: Population = **5,000,000**, Land Area = **50,000 sq. km**
   - Computed Answer: **100 persons per sq. km**
3. **Agricultural Density (Rural Density):**
   - Formula: **Agricultural Density = Rural Population / Agricultural Land Area**

    - Given: Rural Population = **2,000,000**, Agricultural Land Area = **40,000 sq. km**
    - Computed Answer: **50 persons per sq. km of arable land**
4. **Rate of Natural Increase (RNI):**
    - Formula: **RNI = CBR - CDR**
    - Given: CBR = **25 per 1,000**, CDR = **10 per 1,000**
    - Computed Answer: **15 per 1,000 populations (or 1.5%)**
5. **Crude Birth Rate (CBR):**
    - Formula: **CBR = (Total Annual Live Births / Total Midyear Population) × 1000**
    - Given: Live Births = **300,000**, Midyear Population = **15,000,000**
    - Computed Answer: **20 births per 1,000 population**
6. **General Fertility Rate (GFR):**
    - Formula: **GFR = (Total Annual Live Births / Total Women (15–49)) × 1000**
    - Given: Live Births = **150,000**, Women (15–49) = **1,200,000**
    - Computed Answer: **125 births per 1,000 women (15–49)**

Answers along with their **implications**:

1. **Doubling Time: 35 years**
    - **Implication:** A population with an RNI of 2% will double in 35 years if growth remains constant. This rapid growth can strain resources, infrastructure, and services such as healthcare, education, and housing. Sustainable policies are needed to manage this expansion effectively.
2. **Crude Density (Arithmetic Density): 100 persons per sq. km**
    - **Implication:** A population density of 100 persons per sq. km suggests moderate population distribution. If resources and infrastructure are adequate, the area can sustain this density. However, high density in urban areas may lead to congestion, land scarcity, and environmental degradation.
3. **Agricultural Density (Rural Density): 50 persons per sq. km of arable land**
    - **Implication:** A relatively low agricultural density suggests that there is enough land available for farming relative to the rural population. However, if the density increases significantly, it may indicate pressure on agricultural resources, reduced farm sizes, and potential food insecurity.
4. **Rate of Natural Increase (RNI): 15 per 1,000 population (or 1.5%)**
    - **Implication:** A positive RNI means the population is growing naturally without considering migration. A high RNI indicates a young, growing population that requires investment in

education, job creation, and healthcare services to ensure sustainable development.

5. **Crude Birth Rate (CBR): 20 births per 1,000 population**
    - **Implication:** A moderate birth rate suggests stable population growth. If the rate is too high, it can lead to overpopulation concerns. If it is too low, it may indicate aging populations and potential labor shortages in the future.
6. **General Fertility Rate (GFR): 125 births per 1,000 women (15–49)**
    - **Implication:** A high GFR means that women in reproductive age are having a significant number of children, which contributes to population growth. If too high, it may reflect limited access to family planning, while a very low rate may indicate challenges such as economic constraints or delayed childbearing