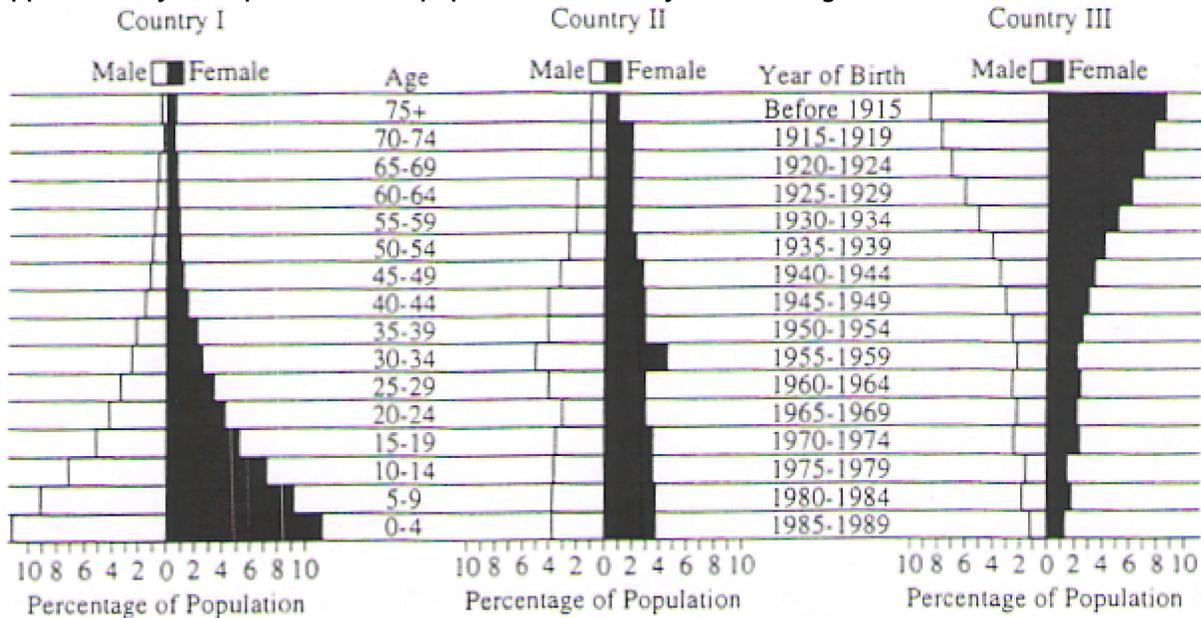


## Human Population

### Multiple Choice

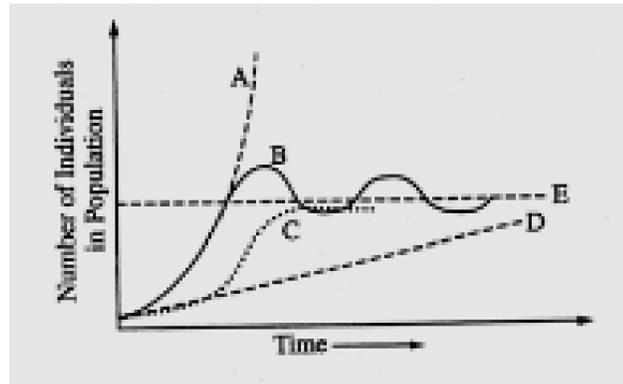
Identify the choice that best completes the statement or answers the question.

1. Approximately what percent of the population in Country II is under age 15?



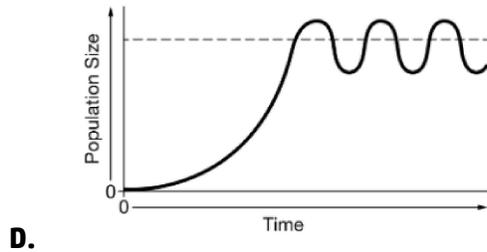
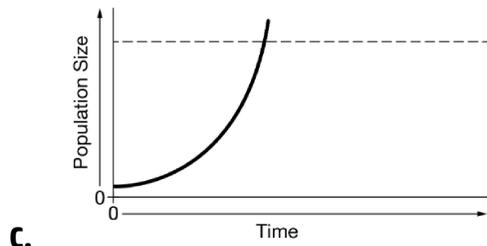
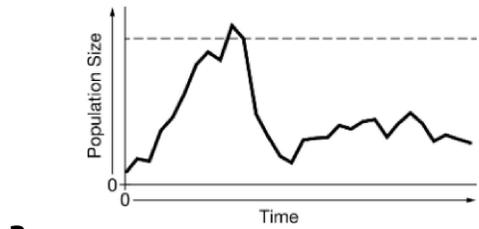
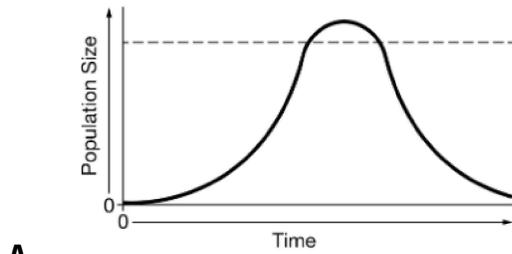
- A. 1%
- B. 5%
- C. 10%
- D. 25%
- E. 50%
2. It has recently been estimated that the growth in world population has slowed in the past decade. Despite this trend, environmentalists remain concerned about the environmental impact of world population, principally because
- A. The standard of living is increasing in many developing countries, leading to an increased per capita use of natural resources
- B. People are living longer in developed nations, putting a strain on the economics of those countries
- C. Life expectancy is still decreasing in Africa due to AIDS
- D. The standard of living is poor in many developing countries, leading to a great deal of deprivation and suffering
- E. Fertility is falling due to exposure to endocrine disrupters released into the environment

Use the graphic for the following three questions.



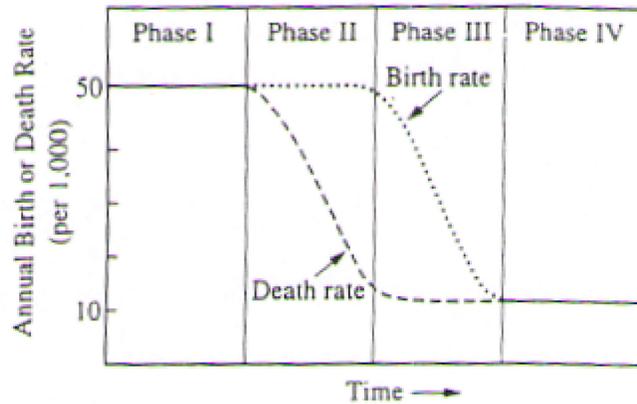
3. Represents the maximum number of individuals that can be supported by a particular ecosystem on a long-term basis.
  - A. A
  - B. B
  - C. C
  - D. D
  - E. E
  
4. Represents the biotic potential of the species.
  - A. A
  - B. B
  - C. C
  - D. D
  - E. E
  
5. Represents the growth of a population predicted by the logistic model.
  - A. A
  - B. B
  - C. C
  - D. D
  - E. E

6. Which of the following graphs best displays population size over time of an r-selected species that has just colonized a new habitat with abundant resources?

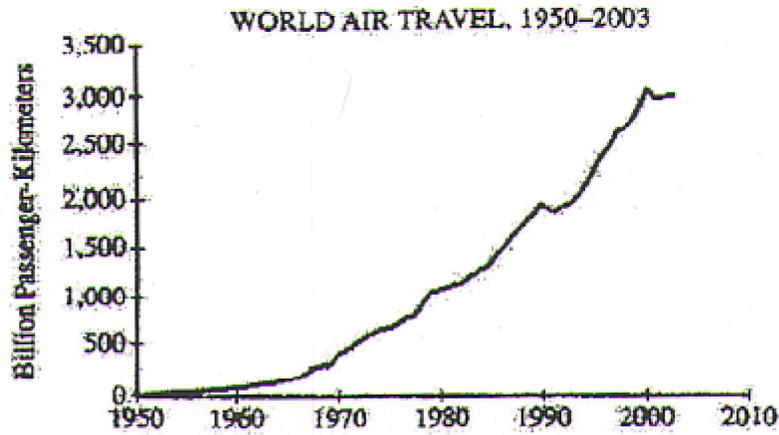


7. An age structure diagram of Germany is likely to

- A. be A-Shaped
- B. be V-Shaped
- C. bulge in the middle
- D. bulge at the top and bottom

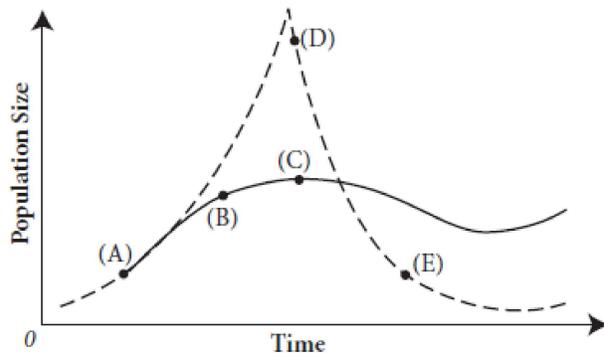


8. A country in which the birth rates only narrowly exceed death rates is most likely
- throughout the underdeveloped stage
  - throughout the pre-industrial stage
  - transitional stage
  - at the end of the industrial stage
  - at the end of the postindustrial stage
9. Zero population growth is associated with
- Phase I only
  - Phase II only
  - Phase III only
  - Phase IV only
  - Phases I and IV
10. Which of the following is the best description of a population that has a stable age distribution?
- A large population that is growing at a constant rate
  - A large population with a negative growth rate
  - A population that is in the early stages of logistic population growth
  - A growing population in which the proportions of individuals in the different age classes remain constant
11. The exponential curve of human population growth is described as
- a C-Curve
  - a J-Curve
  - a K-Curve
  - an L-Curve
  - an S-Curve
12. Which of the following is most typically associated with the transition from a rural to an urbanized society?
- Reduced birth rates
  - Reduced need for sewage-treatment facilities
  - Increased rates of population growth
  - Increased stabilization of microclimate in urban areas



- 13.** The greatest population stability has been achieved in
- A.** North America
  - B.** India
  - C.** Nigeria
  - D.** Northern Africa
  - E.** South America
- 14.** Of the phenomena that correlate with the data below, the one that is the most direct consequence of the trend in air travel is
- A.** The increase in the spread of infectious diseases
  - B.** The increase in urban sprawl
  - C.** The decrease in biodiversity
  - D.** The increase in hypoxic aquatic ecosystems
  - E.** The decrease in the total fertility rate of developed nations

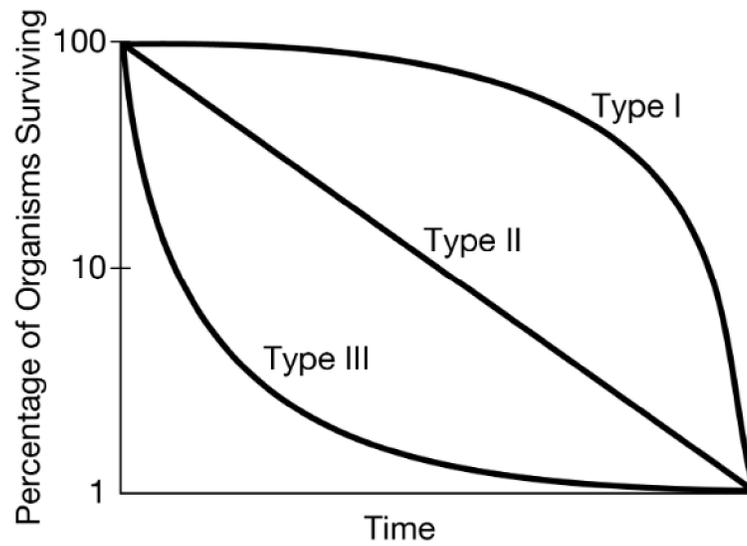
Directions: Select the choice that best fits each statement. The following questions(s) refer to the lettered points of the curves plotted on the graph below. The curves show two possible patterns of change in population size over time for a certain species of small mammal in an ecosystem.



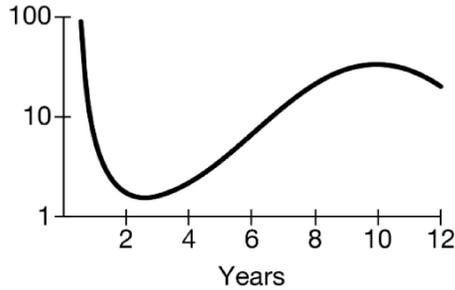
15. Population decreasing at greatest rate
- A
  - B
  - C
  - D
16. Population growing at a decreasing rate
- A
  - B
  - C
  - D

17. Raccoons eat a variety of foods and can live in a variety of habitats, including locations near humans. Tiger salamanders eat an abundance of worms and insects and require wetland habitats so they do not dry out. Which of the following best identifies the two different species?
- Raccoons are decomposers, and tiger salamanders are scavengers.
  - Raccoons are carnivores, and tiger salamanders are herbivores.
  - Raccoons are generalists, and salamanders are specialists.
  - Raccoons have a Type II survivorship curve, and tiger salamanders have a Type I survivorship curve.

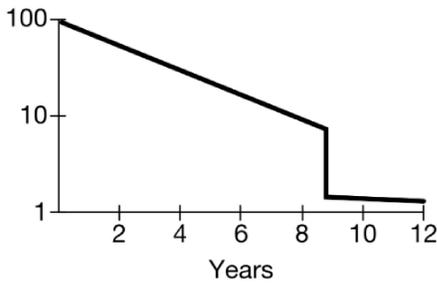
The graph below shows three different survivorship curves.



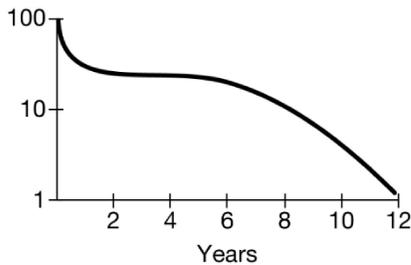
18. Scientists determined that a species of a reptile dinosaur cohort had 20% survivorship during the first two years of life, but then the survivorship of those individuals that survived to age 2 had a 70% survivorship to middle age. Survivorship declined later in life. Which of the following best illustrates the shape of the survivorship curve for this species?



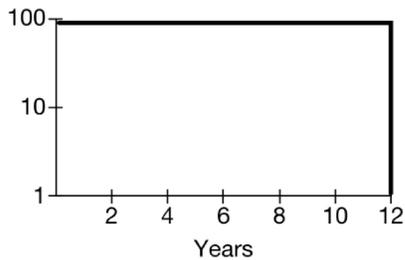
A.



B.



C.



D.

19. Cycads are gymnosperms that were diverse and abundant during the Mesozoic era. Extant species of cycads share many traits with those from the Mesozoic era. Cycads bear cones, are long-lived with slow growth rates, show late reproductive maturity, and have very few offspring. Based on this description, the cycads are
- A. K-strategists with a Type I survivorship curve.
  - B. r-strategists with a Type III survivorship curve.
  - C. K-strategists with a Type III survivorship curve.
  - D. r-strategists with a Type II survivorship curve.

20. Population scientists have theorized that populations undergo a stabilizing demographic transition, whereby
- A. first death rates decrease and then birth rates decrease with the advent of agriculture
  - B. first birth rates decrease and then death rates decrease with the advent of agriculture
  - C. first death rates decrease and then birth rates decrease with the advent of industry
  - D. first birth rates decrease and then death rates decrease with the advent of industry
  - E. first birth rates increase with the advent of agriculture and then death rates increase with the advent of industry

21. The greatest population density is found in
- A. The Netherlands
  - B. South Korea
  - C. the United Kingdom
  - D. China
  - E. Bangladesh

22. The tropical rain forests are known to have a large variety of animals. One example is the orchid mantis that is highly camouflaged when standing on a certain species of orchid found in tropical environments. Another species, the tropical cockroach, can live anywhere in the rain forest where it can find water and a food source.

Which of the following statements best describes why it is predicted that the orchid mantis will be more affected by global climate change than the tropical cockroach will be?

- A. As the climate changes, the number of orchids is likely to increase, leading to more competition for space by the mantis population.
- B. Orchid mantises tend to be advantaged in habitats that remain constant; the rain forest habitat is likely to shift because of global climate change.
- C. Orchid mantises are generalists, so global climate change will give them more diverse habitats to colonize.
- D. Climate change will lead directly to the clear-cutting of the forests, resulting in a smaller habitat for both the mantis and the tropical cockroach.

**23.** The country with the highest population density is

**Directions:** Each of the questions or incomplete statements below is followed by five suggested answers or completions. Select the one that is best in each case.

The following questions refer to the table below, which shows population, area, and energy use of several countries.

Country	Population (millions)	Approximate Total Land Area (million km <sup>2</sup> )	Total Annual Electricity Usage (10 <sup>10</sup> kWh)
Australia	19.7	8.2	22
Bangladesh	144	0.14	1.6
China	1,295	9.6	150
Ethiopia	70	1.12	0.20
India	1,000	3.29	60
United States	300	9.63	400

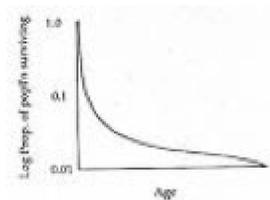
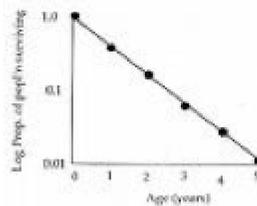
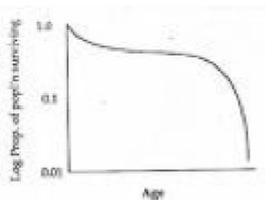
- A. Australia
- B. Bangladesh
- C. China
- D. India

**24.** Survivorship curves for a r-strategist species would correspond with which graph or graphs below  
x-axis = age (time); y-axis = population (size)

I

II

III



- A. I only
- B. II only
- C. III only
- D. I and II only
- E. I and III only

**25.** The current global human population is about 6.1 billion and is growing at an annual rate of 1.35 percent. If world population were to grow at this rate for the next year, approximately how many people would be added?

- A.  $8 \times 10^5$
- B.  $8 \times 10^6$
- C.  $8 \times 10^7$
- D.  $8 \times 10^8$

**26.** As a country goes through the demographic transition, the greatest rate of population growth takes place during which phase?

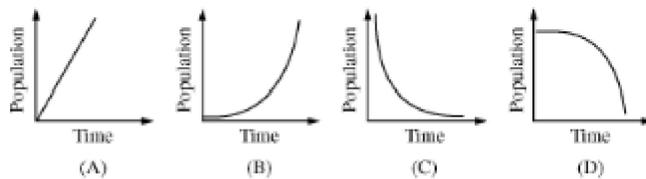
- A. The preindustrial
- B. The pretransitional
- C. The transitional
- D. The industrial

27. The increase in the size of Earth's human population in the last century has been dramatic. Which of the following identifies two major contributors to this increase?
- New methods of agriculture and the identification of new food crops
  - The Industrial Revolution and modern medicine
  - Increased emigration/immigration and decreased warfare
  - New methods of birth control and decreased warfare
  - Increased education for women and the development of new pesticides

28. A small developing country with negligible rates of immigration and emigration is going through a demographic change. Thirty years ago the crude birth rate was 44 per thousand per year and the crude death rate was 17 per thousand per year. Now the crude birth rate is 16 thousand per year and the crude death rate is 5 per thousand per year. Which of the following statements about the country now is most likely to be true?
- The population is decreasing.
  - The growth rate of the population is increasing.
  - The country is at the industrial stage of the demographic transition.
  - The country is at the postindustrial stage of the demographic transition.

29. The K-selection reproductive strategy maximizes survival of offspring by producing
- few offspring with high levels of parental care
  - few offspring with low levels of parental care
  - many offspring with high levels of parental care
  - many offspring with low levels of parental care

30. Which graph best illustrates a population growing at its biotic potential?



- A
- B
- C
- D

31. Which of the following annual population growth rates is paired with the correct doubling time?
- 1% .. 700 years
  - 2% .. 35 years
  - 3.5% .. 12 years
  - 5% .. 350 months

32. Which of the following energy sources is considered nonrenewable?
- fossil fuel energy
  - sunlight (solar) energy
  - geothermal energy
  - tidal energy

- 33.** The crude growth rate,  $r$ , of a population is calculated by
- A.** multiplying the existing population size by life expectancy
  - B.** dividing the crude birth rate by 2
  - C.** dividing the doubling time by 70
  - D.** subtracting the crude death rate from the crude birth rate
- 34.** Which of the following is a true statement about the total fertility of a society?
- A.** The total fertility of a society is positively correlated with the average education of women.
  - B.** The total fertility of a society decreases as the society progresses through the demographic transition.
  - C.** The total fertility of a society is the difference between the crude birth rate and the crude death rate.
  - D.** The total fertility of a society is the number of children necessary for a couple to replace themselves in the next generation.

## Human Population Answer Section

### MULTIPLE CHOICE

1. ANS: D

Country II represents a stable population in which roughly 12% of males and 11% of females are at the pre-reproductive stage. Focus on the shape not so much the values. Country I: An A-shaped graph represents a rapidly growing population

County II: A rocket-shaped graph represents a relatively stable population

County III: An V-shaped graph represents a declining populations (post reproductive years)

PTS: 1

2. ANS: A

Resource consumption in developing nations increases as it transitions to a developed nation. The population has more disposable income as jobs become plentiful and wages increase. With this disposable income comes an increase in the purchase of goods and thus an increase in the use of natural resources per capita.

PTS: 1

3. ANS: E

This question is giving the definition of carrying capacity which the introduction says corresponds to E on the graph.

PTS: 1

4. ANS: A

Curve A represents the maximum number of individuals possible in the system.

PTS: 1

5. ANS: C

The logistic model is depicted by curve C which tops out and levels off at the carrying capacity near line E

PTS: 1

6. ANS: C

This graph shows exponential growth, typical of an r-selected species in habitats with unlimited resources.

PTS: 1

7. ANS: C

Germany is a developed nation with most of its population between the ages of 15 and 55.

An A-shaped graph represents a rapidly growing population

A V-shaped graph represents a declining populations (post reproductive years)

Bulges indicate a baby boom at some point

A constant width graph is relatively stable

PTS: 1

8. ANS: D

As a nation passes through demographic transition, death rate falls as living conditions improve. In stage three, as a country becomes industrialized, birth rates fall as well to a level just above death rates.

PTS: 1

9. ANS: E

Zero population growth occurs in phase 1 and phase 2 of the graph where the line has no slope

Phase II shows a population increase as the birth rate surpasses the death rate

Phase III at the beginning of the phase the birth rate starts to decline (as indicated by a negative slope) and the death rate has already leveled off (no slope-straight line). At the very end of phase III, the birth rate is nearly equal to the death rate

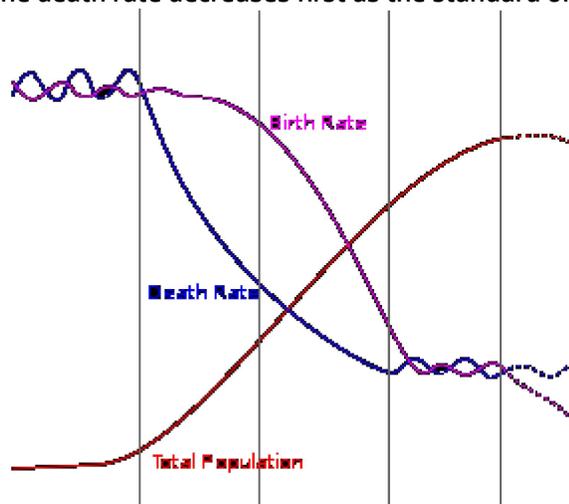
Phase IV the death rate and the birth rate have leveled off (no slope- straight line)

PTS: 1

10. ANS: D PTS: 1

11. ANS: B

The death rate decreases first as the standard of living increases



PTS: 1

12. ANS: A PTS: 1

13. ANS: A

One of the highest living conditions has been achieved in the United States and Canada. With the abundance of land, rights of women, and liquid disposable income, the populations of these countries have stabilized

PTS: 1

14. ANS: A

Infectious diseases spread through direct contact, food, insects or airborne methods. Physical contact can spread diseases like chicken pox, also if you have physical contact with insects like mosquitos they can spread things like malaria.

PTS: 1

15. ANS: D PTS: 1

16. ANS: B PTS: 1

17. ANS: C

Specialists, like the tiger salamander, need a stable habitat. Raccoons can live almost anywhere and have a varied diet, which are characteristics of generalists.

PTS: 1

18. ANS: C

A graph for this species would have a curve that drops off before age 2, is concave until middle age, and then drops again, paralleling that of a Type I survivorship curve.

PTS: 1

19. ANS: A

The description of cycads being long-lived with slow growth rates, showing late reproductive maturity, and having very few offspring is that of a K-strategist with a Type I survivorship curve.

PTS: 1

20. ANS: E

Fertility is the number of children born to a woman during her lifetime. Two types of fertility rates affect a country's population size and growth rates.

1. Replacement-level fertility, is the # of children a couple must bear to replace themselves. It is slightly higher than two children per couple (2.1 in developed countries and as high as 2.5 in some developing countries), mostly because some children die before reaching their reproductive years.

2. Total Fertility rate (TFR) is the average # of children a woman typically has during her reproductive years.

PTS: 1

21. ANS: E

Bangladesh does not have very much square footage of land. This puts approximately 875 people per sq km (2267 people per sq mi) thus giving it the highest population density.

PTS: 1

22. ANS: B

The orchid mantis is a specialist and tend to be more successful in stable environments. The mantis also has a limited habitat and a shift in climate that affects the orchid would have a much larger impact on the orchid mantis than on the tropical cockroach.

PTS: 1

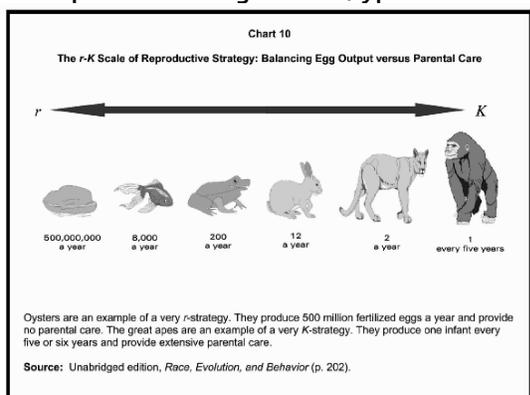
23. ANS: B

PTS: 1

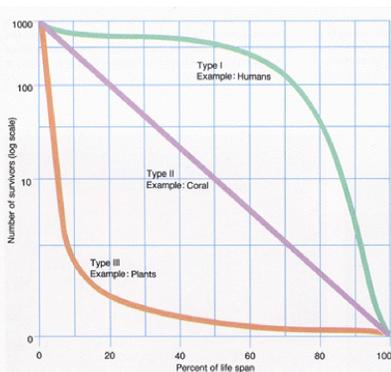
24. ANS: C

r-strategist have larger initial populations and tend to have shorter life span.

Graph A corresponds to K-strategist and graph II is indicative of organisms that are between r and K strategist on the spectrum of organisms (type



II)



PTS: 1

25. ANS: C

You will not have a calculator for the APES exam, so you need to perform quick math. On questions like these, you only need to determine the order of magnitude (what the exponent number is) to select the correct answer.

Quick Math:  $6,100,000,000 \times 0.01$  (rounded the number above)- all you do is move the decimal two places to the left 61,000,000 and then convert to scientific notation  $6.1 \times 10^7$ . The order of magnitude is  $10^7$  so the best answer is  $8 \times 10^7$

$$6,100,000,000 \times 0.0135 = 82,000,000 \text{ million added next year}$$

PTS: 1

26. ANS: C PTS: 1

27. ANS: B

The Industrial Revolution changed the way people live. Instead of a large farming community, people were working in different industries; textile, manufacturing, etc... Families had more money for health care, nutrition, basic necessities. Modern Medicine has increased the life span of men and women. With certain medicines and new medical devices people are living longer lives.

PTS: 1

28. ANS: C PTS: 1

29. ANS: A PTS: 1

30. ANS: B PTS: 1

31. ANS: B PTS: 1

32. ANS: A PTS: 1

33. ANS: D PTS: 1

34. ANS: B PTS: 1