1. If a population of 500 has an intrinsic growth rate of 5% a year and its environment has a carrying capacity of 3,000, what is the least amount of years it take for the population to reach its carrying capacity?

   (1) 20   (2) 30   (3) 40   (4) 50   (5) 60

2. The Earth's exponential increase in human population during the last century has been largely influenced by

   (1) a decrease in wars  
   (2) the Green Revolution  
   (3) the Industrial Revolution  
   (4) increase in birth control  
   (5) increased immigration and emigration

3. A large city has a population of 50 million people. The population is increasing at a rate of 1.9 percent a year. If this rate remains constant, what will the population be in 25 years?

   (1) 50 million   (4) 80 million   (2) 60 million   (5) 90 million   (3) 70 million

4. In general, the total fertility rate

   I. is inversely proportional to per capita income  
   II. is an inaccurate measure of population growth  
   III. is about 2 in the United States

   (1) I only   (4) I and II only   (2) II only   (5) II and III only   (3) III only

5. The greatest population stability has been achieved in

   (1) North America   (4) Northern Africa   (2) India   (5) South America   (3) China

6. The current national population growth rate is about

   (1) .13%   (2) 1.3%   (3) 3%   (4) 13%   (5) 30%

7. The world population is

   I. increasing only in developing nations  
   II. at carrying capacity  
   III. closer to 6.3 billion than 5 million

   (1) I only   (4) I and III only   (2) II only   (5) I, II and III   (3) I and II only

8. Which of the following countries is experiencing the most rapid growth?

   (1) The United States   (4) India   (2) Russia   (5) Mexico   (3) Uganda

9. The biotic potential of most species usually resembles a

   (1) S shaped curve   (4) straight line   (2) J shaped curve   (5) bell shaped curve   (3) L shaped curve

10. A country is going through the demographic transition. As the country enters negative growth rate, which of the following generally stops changing?

   (1) Fertility rate   (4) Birth rate   (2) Population under age   (5) Death rate   (3) Average family size

11. A country's fertility rate is NOT decreased by

   (1) decreased importance of children in labor force  
   (2) urbanization  
   (3) higher educational opportunities for women  
   (4) reduced cost of raising children  
   (5) lower marriage age

12. Which of the following is not a method of reducing population growth within a country?

   (1) Offer incentives to smaller families.  
   (2) Increase education funding which increases likelihood of two income homes.  
   (3) Provide family planning services.  
   (4) Decreasing the cost of land.  
   (5) Increase health care availability, so likelihood some children within a family survive.

13. Current global data indicate that

   I. birth rates are decreasing  
   II. population is declining  
   III. death rates are decreasing

   (1) I only   (4) I and II only   (2) II only   (5) I and III only   (3) III only

14. One would expect to find the most births per woman in which of the following regions?

   (1) Oceania   (4) South America   (2) Equatorial Africa   (5) Southeast Asia   (3) Eastern Europe

15. The age structure of a population is determined by

   I. mortality rate  
   II. fecundity  
   III. generation time

   (1) I only   (4) I and III only   (2) II only   (5) I, II and III   (3) III only

16. The greatest population density is found in

   (1) The Netherlands   (4) China   (2) South Korea   (5) Bangladesh   (3) the United Kingdom

17. By 2100, the population of Japan is expected

   (1) to remain the same   (4) to triple   (2) to halve   (5) to quadruple   (3) to double
Base your answers to questions 18 and 19 on the age structures below, which are expressed as percentage of population for countries A, B, and C.

**Figure 6**

**Population Pyramids:**

Country A

Country B

Country C

18. Approximately what percent of the population in country C is below the age of 20?

(1) 4  
(2) 8  
(3) 16  
(4) 32  
(5) 50

19. Which of the countries is undergoing rapid growth.

(1) A only  
(2) B only  
(3) C only  
(4) B and C only  
(5) A, B, and C

20. The above graph shows age distribution for a certain country. Based on the data, the population is likely to

(1) remain stable in the future  
(2) increase in the future  
(3) increase and then decrease in the future  
(4) decrease and then increase in the future  
(5) decrease in the future

21. Which of the following countries had the sharpest decline in fertility from 1965 to 2000?

(1) Italy  
(2) US  
(3) Mexico  
(4) China  
(5) India

22. In the year 2000, Mexico is most likely in what stage of demographic transition?

(1) Stage 1  
(2) Stage 2  
(3) Stage 3  
(4) Stage 4  
(5) None of the above
23. Base your answer to the following question on the graph below, which shows different stages related to the birth and death rates of human populations over time.

The Classic Stages of Demographic Transition

<table>
<thead>
<tr>
<th>Birth/death rates</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Which of the following best explains the high birth rate in stage 2 in contrast to the rapidly declining death rate?

(1) The average age of marriage increasing
(2) Nations becoming more developed and industrialized
(3) Increases in many areas including technological and medical innovations
(4) Hard to change social values that place value on having many children
(5) Increase in educational and employment opportunities for women

Base your answers to questions 24 and 25 on the demographic transition graph below.

The Classic Stages of Demographic Transition

<table>
<thead>
<tr>
<th>Birth/death rates</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural increase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

24. The US would be currently in

(1) Stage 1
(2) Stage 2
(3) Stage 3
(4) Stage 4
(5) None of the above

25. Most of human history has been spent in which stage of transition?

(1) Stage 1
(2) Stage 2
(3) Stage 3
(4) Stage 4
(5) Human population has not spent an inordinate amount of time in one specific stage.

26. Germany's Population by Age and Sex

Source: Germany, Federal Statistical Office, unpublished tables.

The graph above shows the age distribution for Germany's population. Which of the following most likely was the most substantial cause for the large indentations designated as A and B in the male population which is disproportionate to the matching indentations on the female side?

(1) I only
(2) II only
(3) III only
(4) II and III only
(5) I, II and III

27. Which of the following is a strategy of r-selected species?

I. Conserve energy for elaborate mating rituals
II. Reproduce in abundance to overcome high death rates of unprotected young
III. Give their offspring little protection to help the stronger ones survive

(1) I only
(2) II only
(3) III only
(4) II and III only
(5) I, II and III

28. The largest population density can be found in

(1) Asia
(2) Europe
(3) North America
(4) South America
(5) Australia
29. Which is a valid statement about the above trend in fertility?

I. A change in the average age of marriage has led to this trend.
II. Low infant mortality rate is a result of this trend.
III. Urbanization has led to this trend.

(1) I only  (2) II only  (3) I and II only  (4) I and III only  (5) I, II, and III

Base your answers to questions 30 through 32 on the images below.

30. The survivorship curve of most animals in the Antarctic terrestrial biome is represented by

(1) I only  (2) II only  (3) III only  (4) IV only  (5) II and IV only

31. The survivorship curve of an r-strategist could be represented by

(1) I only  (2) III only  (3) IV only  (4) I and II only  (5) II and III only
32. The survivorship of a K-strategist could be represented by

(1) I only  (2) III only  (3) IV only  (4) I and II only  (5) II and III only

33. The graph below represents the population of a city in which country?

(1) Uganda, a less-developed country  (4) Australia, a less-developed country
(2) United States, a highly-developed country  (5) India, a highly-developed country
(3) Canada, a less-developed country

34. Exponential growth

(1) starts out fast and gradually slows down
(2) is possible to continue unhindered in the natural world
(3) is characteristic of the human population
(4) is the same as logistic growth
(5) has an S shaped curve

35. For the following question, refer to the diagram below.

Which lettered portion of the curve most closely corresponds to the carrying capacity of the ecosystem?

(1) A  (2) B  (3) C  (4) D  (5) E

36. The best measure of a society's quality of life is its

(1) gross national product  (4) life expectancy
(2) educational standards  (5) fertility rates
(3) infant mortality rate
37. Which of the following is a true fact about the Earth's population?

- The human population on earth has not yet reached the earth's carrying capacity.

(2) The earth's optimum sustainable population is not known.

- Encouraging population growth could help stimulate economic growth.

- The earth can support much more than the current population.

- Population growth is slowing down.

38. Currently, _______ countries make up the majority of the world's population. At the end of the twenty-first century, _______ countries are expected to make up the majority of the world's population.

- developed; developed
- developed; developing
- (3) developing; developing
- developing; developed
- (5) population changes are not predictable

39. All of the following explain why higher economic standards result in fewer children EXCEPT

- both mothers and fathers tend to work
- more money is available for parents' retirement
- higher educational levels postpone the age at which a woman has her first child

(4) efficient economies tend to have reached carrying capacity

- parents are able to focus on their children's futures and not daily survival

40. High rates of population growth in less developed countries are due primarily to

I. economic factors
   II. cultural factors
   III. genetic factors

- I only
- (4) I and II only
- II only
- (5) I, II and III
- III only
41. A fictional country dubbed Eduwaria started tracking its population data in 1990. During that first year that vital statistics were reported the population was 6.9 million, with a crude birth rate of 42 per 1,000. Eduwaria in 1990 was still growing slowly because of the death rate of 40 per 1,000. In 1995 there was a record number of babies born, pushing up the birthrate to 45 per 1,000 while death rate remained at 40 per 1,000. The year 2000 saw the first drop in death rate, which lowered to 37 per 1,000 while birthrate resumed 1990 levels. In the year 2005 death rate continued to decrease, dropping to 30 per 1,000 while birthrate reached a record low of 40 per 1,000. In the year 2010 the birth rate stayed steady at 40 per 1,000 while death rate plummeted to 17 per 1,000. Finally in the year 2017, population growth reached an annual rate of 2.8% with a very low death rate of 9 per 1,000 as Eduwaria boasted a population of 10 million.

(a) Plot the crude-birth rate and death-rate data from 1990 to 2017 on the axes above. Label both the axes and curves.
(b) What do you predict is going to happen to the birth and death rates of Eduwaria in the next following decades?
(c) Calculate Eduwaria's annual growth rate in 2012 and Eduwaria's death rate in 2017.
(d) Indicate two possible reasons why birth rate was still so high in 2017. Indicate one possible reason for the large drop in death rate.
(e) If Eduwaria continues to grow at the annual growth rate in 2017, what might be the population of Eduwaria in 2067?

42. Below are two age diagrams for two different countries.

(a) What are the types of growth rates that characterize countries A and B and what does this show about the countries' states of development? (For the purposes of this question, country B has the majority of its major reproductive age groups under the bulge and there is a high proportion of individuals beyond prime reproductive years.)
(b) Explain how each age structure contributes to the country's current population stability and what it implies for the country's future population stability. Discuss ideas such as birthrate, death rate, prime reproductive range, and age distribution.
(c) Based on the above diagram what can we infer about future social conditions? Age distribution can affect things such as unemployment and social welfare costs.
1. 3
2. 3
3. 4
4. 3
5. 1
6. 2
7. 2
8. 3
9. 2
10. 5
11. 5
12. 4
13. 5
14. 2
15. 5
16. 5
17. 2
18. 3
19. 1
20. 5
21. 4
22. 3
23. 4
24. 4
25. 1
26. 1
27. 2
28. 1
29. 4
30. 1
31. 2
32. 1
33. 1
34. 3
35. 5
36. 3
37. 2
38. 3
39. 4
40. 4
41. (chart)
42. (essay)
42. (a) Country A shows rapid growth which is common for undeveloped countries. Country B shows negative growth rate which is common for developed countries.
(b) Country A has an age structure that is bottom heavy, skewed towards young individuals who will grow up and sustain this big growth rate with their own reproduction. Thus the heavy age distribution in the younger range will eventually lead to additional population growth as the youth move towards the prime reproductive range from 15-44. Birthrate definitely exceeds death rate and will continue to do so. Meanwhile country B has a slight bulge in the older populations. This bulge is mostly above the prime reproductive range and so for the most part death rate is either balanced with birthrate or is about to overcome birthrate. Country B's population will decrease in the future.
(c) Country A will have to worry about increasing unemployment rates in the future, as there will be continual increase in the number of working-age people. Country B will have to worry about a decreasing number of working-age people which will supporting an increasing number of retired people. Social welfare will become costly.