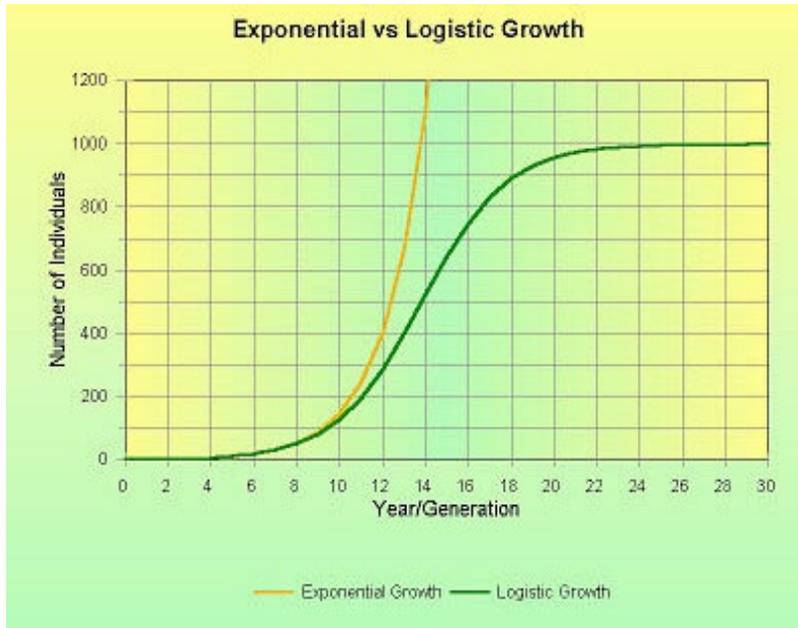Name: _____ Per: _____ Date: _____

Population Ecology Graphs *(Make sure you can analyze these for the test!)*
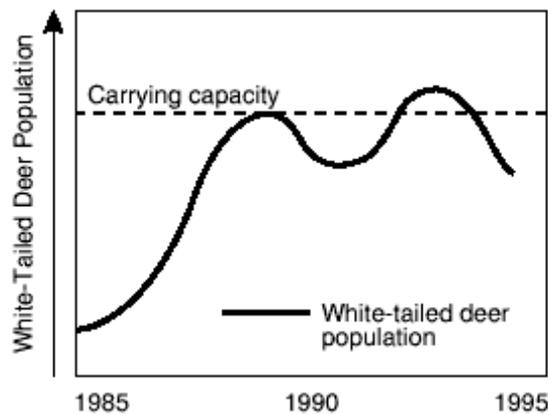
Directions: Look at the graphs below and answer the following questions.

Graphs 1 - Exponential Growth and Carrying Capacity

1. Which of the two curves exhibits exponential growth? _____

2. Which of the two curves exhibits a carrying capacity? _____

3. What is the carrying capacity of this graph? _____

4. In what generation does this population reach its carrying capacity? _____

Graph 2

5. For what type of organism is the carrying capacity shown? _____

6. Give one possible reason why the population decreased in 1990 after it had reached its carrying

capacity. _____

7. Give one hypothesis to explain why the population exceeded its carrying capacity in 1992.

_____

8. Why did the population decrease in 1994 after it exceeded the carrying capacity? _____

_____

Graph 3- Survivor Graphs
Graph 3 shows 4 different growth curves- A, B, C & D.
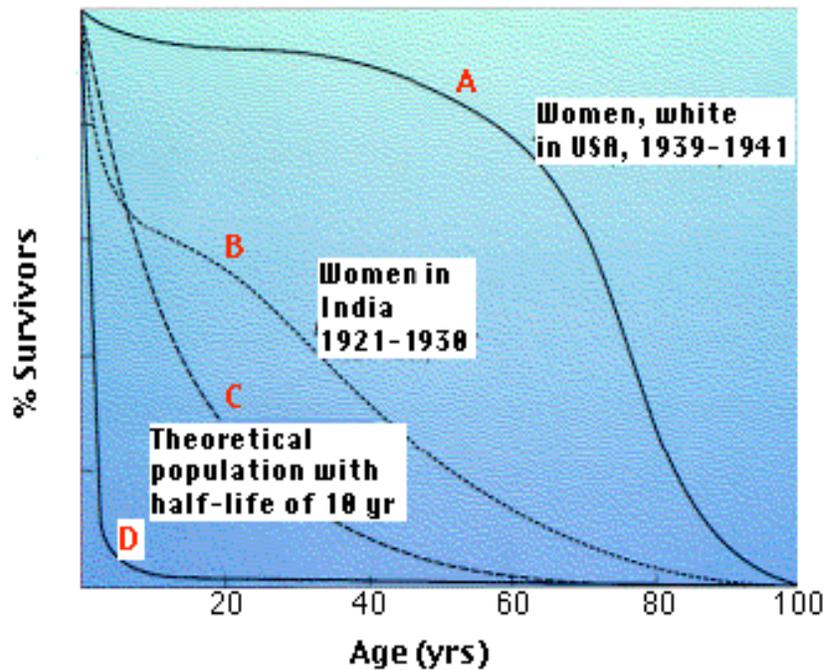
Curve A shows a white woman's life expectancy in the USA.
Curve B shows an Indian woman's life expectancy in India.
Curve C shows fish's life which has an equal chance of dying at any age.
Curve D shows an oyster's life in which there are many young but few survive to adulthood.

9. Who has a better chance of surviving infancy - Indian or American women? _____

10. At what age are most oysters dead? _____

11. At what age are most fish dead? _____

12. Look at Curve A. Notice that it levels off between the ages of 20-40. What does this mean?

_____

13. Which has a longer life expectancy - fish or oysters? _____

14. Which organism best represents an R-selective species? Why?

_____

_____

Graph 4 - Competition Curve

Graph 4 shows the growth of 2 species of bacteria grown on the same petri dish. It also shows their growth rate when grown separately.
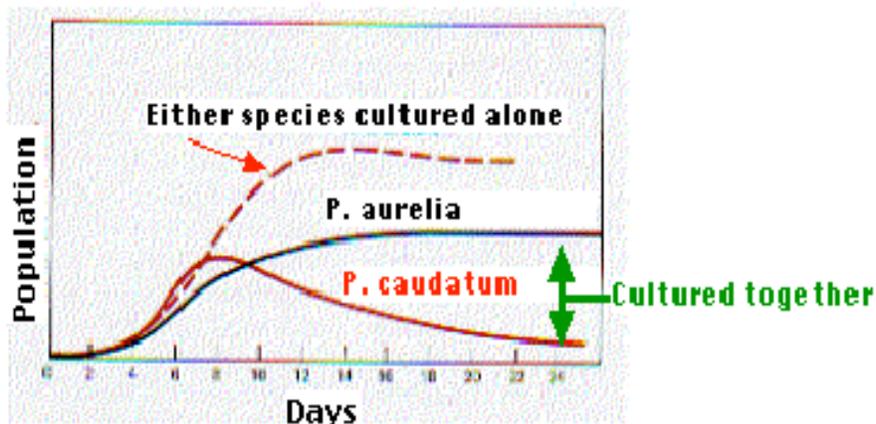
15. Which of the 2 types of bacteria will soon die? Why? _____

_____

16. Which of the 2 bacteria strains is better adapted for competition? _____

17. How is the growth rate for P. caudatum different when it is grown alone? _____

_____

18. What happens to the growth rate of P. aurelia around day 12? _____

_____

Graph 5 – Predator-Prey Graph

Isle Royale National Park on a remote island was established in 1940, and designated a wilderness area in 1976. The only mode of transportation available is by boat or seaplane. Moose first arrived at Isle Royale around 1900. The moose population tends to increase in years with mild winters, early spring green-up, abundant winter forage, low wolf numbers and low levels of tick infestation. Wolves first arrived at the island on an ice bridge from Canada in 1940. Disease has also influenced the wolf population. Between 1980 and 1982, the wolf population declined from 50 to 14, due to canine parvovirus.
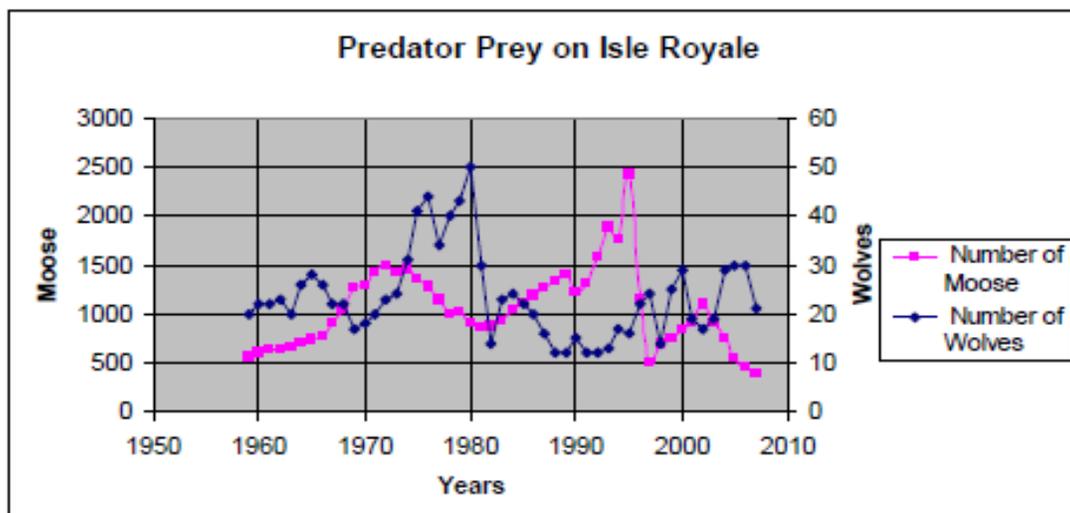
19. What is the greatest moose population? What year did that occur? What was the wolf population when the moose population the greatest?

_____

_____

20. What would happen to the wolf population if the moose population decreases? _____

_____

21. What would happen to the moose population if the wolves were removed from Isle Royale?

_____

22. Describe the pattern between the wolf (predator) population in relation to the moose (prey) population.

_____

23. Identify a factor, other than moose population, that has influenced the wolf population in Isle Royale.

_____

24. Identify two factors, other than the wolf population, that may influence the moose population.

_____

_____

25. Isle Royale has been undeclared as a national park and has been purchased by a large resort.

Describe one positive and one negative impact on the Isle Royale ecosystem. _____

_____

_____

26. Are predator-prey relationships density-dependent or density-independent limiting factors? Explain.

_____

_____

27. Use the graph to the right to calculate the lag time in months between the change in the densities of prey and the predator populations.

COMPARISON OF PREY AND PREDATOR POPULATIONS