BIO 20 – REVIEW FOR EXAM 1

Sp05

Exam includes multiple-choice, matching, short-answer questions. ***No*** electronic devices or dictionaries are permitted. Only ***one*** exam may be made-up for a legitimate medical or legal emergency if accompanied by official verifiable documentation; the make-up exam must be scheduled within one week. All testing accommodations must follow pre-approved DSPS guidelines and regulations.

INTRODUCTION

1. Restate the definition of ecology, and identify its most critical factors (distribution & abundance).

2. Distinguish the following terms: abiotic & biotic factors; environmental science & environmental studies; population, symbiosis, community, ecosystem; habitat & niche; biome, zoogeographical realm, & biosphere.

3. Describe the various terrestrial & aquatic biomes, and the location of the zoogeographical realms.

4. Identify the different focus in descriptive, functional, theoretical, applied, & restoration ecology; wildlife management, conservation biology.

EVOLUTION & SPECIATION

1. Identify the central theme in biology and Darwin's explanations for how evolution occurred.

2. Restate the arguments of natural selection and the criteria for fitness (survival & reproduction).

3. Identify examples of pre-mating & post-mating isolating mechanisms and how they maintain speciation.

4. Describe the primordial soup experiment and its implications for the origin of life in the oceans.

POPULATION DISTRIBUTION & SURVIVORSHIP

1. Distinguish the following terms and their ecological significance: absolute abundance, complete census, sampling, mark-release-recapture; crude & ecological density; random, uniform, & clumped spatial distribution; pre-reproductive, reproductive, & post-reproductive age classes.

2. Compare the birth rate, death rate, and age pyramid for stable, increasing, & decreasing populations.

3. Distinguish the following terms: sex-ratio, birth rate (b), death rate (d), mortality rate (q), survival rate (l).

4. Interpret the concave, linear, & convex survivorship curves, and provide a representative of each.

POPULATION GROWTH

1. Interpret the values in the two population growth equations and curves: dN/dt (rate of population growth), N (population size), r (intrinsic rate of increase), and K (carrying capacity).

2. Distinguish the following terms: exponential growth (J) & logistic growth (S) curves; opportunist (r-selected) & equilibrium (K-selected) species; chaotic, cyclic, & damped fluctuations.

3. Describe the factors leading to low population growth when population density is very low or very high.

POPULATION REGULATION

1. Distinguish the following terms: density dependent & density independent factors; intraspecific & interspecific competition: scramble & contest competition.

2. Identify the sources & population outcome of social stress, disease & parasitism, saturation & pre-saturation dispersal.

3. Distinguish following terms: alpha, beta, omega, peck-order, peck-dominance; aggression, subordination, displays; home range, territory, floaters.

4. Discuss the social arrangement underlying dominance hierarchies and territories (including their sizes), and how they evolved for population regulation.

POPULATIONS: REPRODUCTION

1. Compare the advantages and disadvantages of asexual & sexual reproduction.

2. Distinguish the following terms: spermatozoa & ovum; dioecious & monecious; sequential & simultaneous monecious; cross & self-fertilization; genetic & environmental sex determination; monogamy, polygyny, polyandry, polygynandry, promiscuity, parthenogenesis; precocial & altricial development.

3. Describe the different reproductive strategies of males and females in a sexually dimorphic species.

4. Describe the evolution and population consequences of the different mating systems, the numbers of offsprings produced, and the age of sexual maturity.

5. Compare the differences in reproduction and population among r-selected and K-selected organisms.

POPULATIONS: SOCIAL BEHAVIOR

1. Identify ethology, fixed action pattern, reflex, imprinting, conditioning, habituation, and sociobiology.

2. Describe the different modes of kinesis and taxis, and the environmental cues used in navigation.

3. Describe differences between instinctive & learned behavior; and discuss the nature-nurture controversy.

4. Discuss the benefits and disadvantages of sociality; and the various modes of communication & displays.

5. Describe the evolution of insect societies in relation to inclusive fitness, kin selection, and selfish genes.