Failure to follow the directions will cost you AT LEAST 5 points off of your total score. A #2 pencil must be used. Put your signature on the backside of your answer sheet. Write 1432 EXAM 1-A and the color of your exam at the top of the front side of your answer sheet. Print your name on the answer sheet, last name first and fill in the bubbles. Put your social security number in the spaces provided for ID Number and fill in the appropriate. Leave no blanks, use no hyphens, and use ONLY columns A through I for your SS#. Select the **one best answer** for each question. Turn in the EXAM form and answer sheet when you are finished. **DO NOT MARK YOUR ANSWERS OR WRITE ANSWERS IN THE MARGIN OF YOUR EXAM FORM. IF YOU DO SO, YOU WILL RECEIVE A ZERO FOR THIS EXAM.**

1. The **_____** from any trophic level is not available to any to the next higher level.  
   a) NPP; b) GNP; c) biotic nutrients; d) PAN; e) ACLU.

2. Term associated as factors that diminish the impact of the intrinsic rate of growth is: a) competitive exclusion; b) hiding places for the prey; c) environmental resistance; d) a and b; e) b and c.

3. In the food chain grass --> rabbit --> eagle, the interaction between the grass and eagle is: a) predation; b) commensalism; c) competition; d) neutral; e) mutualism.

4. The total number of individuals of the same species that occupy a given area at a given time is: a) the population density; b) the population growth; c) the population birth rate; d) the population size; e) the carrying capacity.

5. Which of the following includes all the others? a) ecosystem; b) biosphere; c) community; d) individual; e) population.

6. When it is winter in Canada, it is **_____** in Australia because of the **_____** of the earth.  
   a) winter, tilt; b) winter, rotation; c) summer, tilt; d) summer, rotation; e) not enough information is given to answer this question.

7. Species A has a fundamental niche completely within that of species B. If A is to survive in nature in the presence of species B, species A must be a: a) specialist; b) herbivore; c) carnivore; d) decomposer; e) it is impossible for A to survive.

8. The organization of organisms which involves putting those with similar functional niches together illustrates the **_____** of the community. a) species diversity; b) competitive exclusion; c) productivity; d) social structure; e) trophic structure.

9. A predator sees and approaches a potential prey item, but the predator recognizes the prey and quickly avoids it. Which of the following may have happened? a) the
10. The process of the development of a community on what was once barren rock is called: a) succession; b) primary succession; c) secondary succession; d) community diversity; e) trophicism.

11. Termites and the organisms that live in their guts are an example of: a) commensalism; b) obligatory mutualism; c) facultative mutualism; d) competition; e) neutralism.

12. A network of interactions that involve the cycling of materials and the flow of energy between a community and its physical environment is a(n): a) population; b) community; c) ecosystem; d) biosphere; e) species.

13. About _____ percent of the solar energy reaching the earth is stored as organic material: a) 1-2; b) 8-9; c) 10-12; d) 15-18; e) 25.

14. Compared to agricultural communities, natural communities: a) are less stable; b) have greater species diversity; c) have incomplete biogeochemical cycles; d) have less competition; e) require greater energy input.

15. Competitive exclusion is the result of: a) mutualism; b) commensalism; c) competition; d) predation; e) parasitism.

16. In natural communities some feedback mechanisms operate whenever populations change in size; they are: a) density-dependent factors; b) density-independent factors; c) always intrinsic to the individuals of the community; d) always extrinsic to the individuals of the community; e) none of the above.

17. If a species occurs in several habitats it may be more successful in one habitat compared to others. Data important in the determination of the relative success may include: a) population density; b) life tables; c) immigration rates; d) a and b; e) only a, b, and d.

18. The _____ community is the assemblage of plants that persist and replace themselves through time. a) pioneer; b) climax; c) fugitive; d) convergent; e) none of the above.

19. Which of the following could represent a territory? a) a feeding area; b) a nesting area; c) a mating area; d) all of the above; e) a and b.

20. Which of the following is true regarding density-dependent mortality? a) as density increases, the percent surviving stays the same; b) as density increases, the percent surviving decreases; c) as density decreases, the percent surviving stays the same; d) as density increases, the percent giving birth increases; e) as density increases, the percent giving birth decreases.
21. Carbon is cycled into the atmosphere during: a) respiration; b) photosynthesis; c) fossilization; d) calcification; e) as carbon atoms during biological decay.

22. The _____ community is the assemblage of plants that colonize a site. a) pioneer; b) climax; c) fugitive; d) convergent; e) none of the above.

23. The coriolis effect is a result of: a) differences in longitudinal wind speed as latitude differs; b) differences in solar insolation as latitude differs; c) differences in the easterly vector of the earth’s rotation as latitude differs; d) similarities in wind speed although latitude differs; e) similarities in solar insolation although latitude differs.

24. Keystone species: a) influence the structure of the communities in which they live more than expected on the basis of their abundance; b) strongly influence the species composition of communities; c) may speed up the rate of succession; d) may be herbivores or carnivores; e) all the above.

25. A factor that does not influence variation in the heating of the earth’s surface is: a) variation in area receiving sunlight as a result of the earth’s curvature; b) thickness of the atmosphere sunlight must penetrate; c) variation in materials sunlight strikes; d) high specific heat of water; e) all the above influence variation in heating.

26. A random distribution of members of a population is usually caused by: a) settling near one’s birthplace; b) territoriality; c) competition for a uniformly distributed resource; d) the interaction of several factors that affect survival; e) lack of dispersal.

27. In the graph labeled Fig. 1, which of the expressions (a through e) of the exponential growth equation should be increased for curve 1 to be more like curve 2? a) N; b) d; c) b; d) (b-d); e) K.

28. For a species that breeds only one season and lives in a disturbed environment where new favorable habitat is constantly being created, it would be best to produce: a) many small offspring only once; b) a few small offspring only once; c) many small offspring more than once; d) many large offspring more than once; e) both large and small offspring, but only once.

29. A bird eats the fruit of a plant. The seeds are not digested and germinate in the bird’s excrement at some distance from the parental plant. This is an example of: a) parasitism; b) competition; c) commensalism; d) mutualism; e) obligatory mutualism.

30. Which vertical line in Fig. 2 represents the time at which the predator population (gray) is increasing and the prey population is decreasing? a, b, c, d, or e.

31. If the earth did not spin on its axis, from what direction would the northeast trade winds blow? A) northeast; b) south; c) north; d) east; e) west.
32. Which of the following would not be considered an ecosystem? A) a small pond; b) Texas coastal prairie; c) all the fish inhabiting a coral reef; d) the earth; e) a pile of cow dung in a pasture.

33. Which of the following is not true about biogeochemical cycles? A) Most elements remain longest in the living portion of an ecosystem; b) gaseous elements cycle more quickly than elements without a gaseous phase; c) You may have some atoms in your body that were once part of a dinosaur; d) biogeochemical cycles all include both an abiotic and biotic component; e) all nutrients or elements are subject to recycling.

34. Using Fig. 3, which is true about species richness? A) 1 is the point showing species richness on a near, small island; b) 2 is the point showing species richness on a near, large island; c) 3 is the point showing species richness on a far, large island; d) 4 is the point showing species richness on a far, small island; e) none of the above are correct.

35. Which of the following locations would you expect to have the greatest number of species: a) mountainous forest area on a mainland in a temperate zone; b) mountainous forest area on a mainland in the tropics; c) hot desert; d) mountainous forest area on a peninsula in the tropics; e) cold desert.

36. Which of the following is not a major cause of global reduction of biodiversity? A) overexploitation; B) global warming; c) habitat destruction; d) introduced species; e) habitat fragmentation.

37. Which of the following characteristics would cause a country to be considered a high-priority region for conservation efforts? A) a high number of endemic species; b) having low species richness; c) Having few natural habitats; d) very high little r for the human population; e) all the above.

38. Of the following, which currently is the most important factor causing a decrease in biodiversity? A) background extinction; B) anthropogenic extinction; c) mass extinction; d) being an r-selected species; e) none of the above.

39. Which of the following give reason for pursuing conservation biology efforts? A) species have economic value; b) it is the moral and ethical thing to do; c) certain species provide indication of environmental health; d) diversity of species and their present status can be valuable and appealing; e) all the above.

40. E. coli, a representative prokaryotic organism, take at least ______ minutes to undergo cell fission.
A. 0.5
B. 5
C. 20
D. 200
E. 1000
41. Which of the following statements or terms are not associated with cellular reproduction?
A. Sensing a signal - either external or internal - to begin cellular division
B. Distribute the replicated DNA to the two daughter cells.
C. Histone packaging.
D. Cytokinesis.
E. DNA replication.

42. In class we discussed the importance of chromatin compaction during both mitosis and meiosis. Which of the following processes is made easier by compaction?
A. Distributing genetic material to the daughter nuclei.
B. Replicating the DNA.
C. Unwinding DNA from the histone proteins.
D. Accessing the information within the DNA.
E. Kinase activation.

43. During Anaphase II of meiosis II each chromosome consists of _____ centromere(s) and _____ chromatid(s).
A. 1, 0
B. 2, 0
C. 2, 1
D. 1, 1
E. 1, 2

44. Which of the following is an example of programmed cell death (apoptosis)?
A. Homologous chromosomes.
B. The lack of webbing (skin) between the fingers on your hand.
C. Transition from G1 to G2 phase of the cell cycle.
D. Entry into the S phase of the cell cycle.
E. Mouse coat color.

45. Which of the following is a false statement about meiosis?
A. Chromosome number is reduced because the DNA is replicated once, but divided twice.
B. A triploid nucleus (3 copies of the genome) cannot undergo meiosis because not all of the chromosomes can form homologous pairs.
C. Homologous chromosomes, 'homologs', separate during meiosis II.
D. Meiosis I is a reductional division.
E. Recombination occurs during prophase I, and this contributes to genetic diversity.

46. In Mendel's experiments, if the allele for tall (T) plants was incompletely dominant over the allele for short plants (t), what would be the result of crossing two Tt plants?
A. 1/8 would be tall; 1/3 intermediate height; 1/9 short.
B. All would be tall.
C. All would be intermediate.
D. 1/2 would be tall; 1/2 short.
E. 1/4 would be tall; 1/2 intermediate height; 1/4 short.

47. Two agouti mice that are heterozygous at gene loci for pigmentation production, A, and pigment deposition (banding pattern), B, are mated and produce a litter of 16
pups. Nine are agouti (like the parents), 3 are black, and 4 are white. Which of the following statements is not correct?

A. The genotypes of the parents are AaBb.

B. The black and white pups cannot be offspring of these agouti parents.

C. This is an example of epistasis (one gene product altering the phenotypic affect of another gene product).

D. The recessive (defective) gene for pigment production produces a white mouse, no matter what the genotype is at the second locus.

E. The coat color phenotype of each parent is agouti.

48. Which of the following is true of a “test cross”?

A. An individual of questionable phenotype is crossed with an individual showing the recessive trait.

B. An individual of questionable genotype is crossed with an individual showing the recessive trait.

C. An individual of questionable phenotype is crossed with an individual showing the dominant trait.

D. An individual of questionable genotype is crossed with an individual showing the dominant trait.

E. An individual of questionable genotype is reciprocally crossed with an intermediate individual.

49. Eye color in flies is a sex-linked trait. A female with red eyes mates with a male with white eyes. Red eye color is dominant to white eye color. Which of the following is a true statement about their offspring?

A. If the female is heterozygous for red eyes, all offspring will be carriers for red eyes.

B. If the female is homozygous for red eyes, none will have red eyes.

C. If the female is homozygous for red eyes, all offspring will be red eyed.

D. If the female is heterozygous for red eyes, all males will have white eyes.

E. If the female is homozygous for red eyes, all females will have white eyes.

50. In the life table below, the age specific total production of young in the forth age class is _____ and the term for the average number of offspring produced by a female is ______. a)0.3, age specific survival; b)3.6, age specific fecundity; c)1.1, age specific fecundity; d)3.0, population specific fecundity; e)1.2, age specific reproductive rate.

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