

國立屏東科技大學 一〇〇 學年度 碩士班甄試 招生考試
熱帶農業暨國際合作系(所)碩士班 生態學 試題

I. 選擇題(單選，共 30 題，每 1.5 分/題，計 45 分。請在答案紙作答，先寫題號，再寫答案。答錯不倒扣分。)

1. The kingdom that contains the most trophic diversity:
 - a) Plantae
 - b) Animalia
 - c) Monera
 - d) Fungi
 - e) Protista
2. Human populations are clumped on a large scale with the greatest concentration in
 - a) Africa.
 - b) Asia.
 - c) Europe.
 - d) North America.
 - e) South America.
3. In freshwater lake ecosystems, _____ controls rates of primary productivity.
 - a) density of herbivores
 - b) size of depth of the lake
 - c) distance from the equator
 - d) nutrient availability
 - e) b and d are correct
4. Herbivores, carnivores, and detritivores are all
 - a) omnivores.
 - b) autotrophs.
 - c) animals.
 - d) browsers.
 - e) heterotrophs.
5. Nitrifying bacteria, *Nitrosomonas*, and sulfur-oxidizing bacteria
 - a) are both heterotrophs.
 - b) are both chemoautotrophs.
 - c) are both parasitic.
 - d) use reduction as an energy yielding process.
 - e) all of the above.
6. If the age distribution diagram is bottom heavy or pyramidal in shape, this indicates that the population is
 - a) stable.
 - b) declining.
 - c) growing slowly.
 - d) growing rapidly.
 - e) cannot be determined.
7. Organisms that produce many offspring would best be characterized by which of the following?

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- a) a convex survivorship curve
 - b) a concave survivorship curve
 - c) a linear curve survivorship curve
 - d) a sigmoidal survivorship curve
 - e) none of the above
8. Which of the following organisms use inorganic matter as their energy source?
- a) photosynthesizers
 - b) chemosynthesizers
 - c) autotrophs
 - d) both photosynthesizers and chemosynthesizers
 - e) photosynthesizers, chemosynthesizers and autotrophs
9. _____ is/are defined as a group of potentially breeding organisms within a species in a given space and time.
- a) density
 - b) abundance
 - c) distribution
 - d) populations
 - e) community
10. Darwin is often considered the father of evolutionary thought. Which of the following terms is/are not part of Darwin's analysis?
- a) gene frequencies
 - b) natural selection
 - c) adaptation
 - d) fitness
 - e) none of the above
11. Evolution results from
- a) mutations.
 - b) natural selection.
 - c) genetic drift.
 - d) gene flow.
 - e) all of the above.
12. The Hardy–Weinberg principle states that
- a) genotypic changes will result in phenotypic changes.
 - b) phenotypic changes will result in genotypic changes.
 - c) allelic frequencies within a population will not change unless certain conditions are met.
 - d) allelic frequencies within a population will change unless certain conditions are met.
 - e) none of the above.
13. Several studies indicate that environmental conditions dictate plant biomass allocation; plants grown in infertile soils will allocate more energy into _____ biomass.

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- a) leaf
 - b) stem
 - c) root
 - d) flower
 - e) seed
14. Which of the following is not a considered a form of plant defense?
- a) silica
 - b) thorns
 - c) cellulose
 - d) phenolic compounds
 - e) All the above mentioned are plant defenses.
15. Density dependent factors include all of the following **except**:
- a) competition.
 - b) disease.
 - c) predation.
 - d) temperature.
 - e) none of the above
16. Why would a scientist choose to use DNA analysis rather than isozyme analysis when investigating genetic variations?
- a) smaller sample size can be used for DNA analysis
 - b) repeat sampling over a period of time is possible
 - c) non-injurious to the organism
 - d) non-lethal
 - e) all of the above
17. Research on eusociality suggests that the evolutionary driving force(s) to preserve this form of sociality is/are?
- a) kin selection
 - b) inclusive fitness
 - c) environmental adaptation
 - d) both kin selection and inclusive fitness
 - e) kin selection, inclusive fitness and environmental adaptation
18. A polymorphic locus is one that
- a) codes for more than one protein.
 - b) codes for both protein and lipid.
 - c) occurs in a population as more than one allele.
 - d) occurs on more than one chromosome.
 - e) can cause more than one phenotype in an individual, depending on the environment.
19. The number of eggs laid by a female is called her
- a) fertility.
 - b) gonadosomatic index.

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- c) growth form.
 - d) rotundity.
 - e) fecundity.
20. A fish maturing late with large body size and producing many small offspring would be said to have a(n)
- a) periodic life history.
 - b) opportunistic life history.
 - c) equilibrium life history.
 - d) precocial life history.
 - e) stress-tolerant life history.
21. The study of the relationship between climate and the timing of ecological events is called
- a) ecology
 - b) phenology
 - c) oenology
 - d) climatology
 - e) life history theory
22. Fitness is defined as the
- a) health of an individual organism.
 - b) ability of an organism to adapt to new environmental situations.
 - c) quality of offspring produced.
 - d) number of genes contributed by an individual to the next generation.
 - e) all of the above
23. Which of the following is NOT considered a greenhouse gas?
- a) ozone
 - b) water
 - c) oxygen
 - d) methane
 - e) none of the above
24. Which factor may affect species richness on islands?
- a) island area
 - b) distance between an island and original colonists
 - c) degree of island isolation
 - d) all of the above
 - e) none of the above
25. Which hypothesis suggests that the tropics have species richness due to an environment most conducive to growth?
- a) productivity
 - b) environmental heterogeneity
 - c) favorable
 - d) time since perturbation

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e) none of the above

26. Which of the following is NOT a phase of the biomass accumulation model?

- a) steady state
- b) biomass loss
- c) aggradation
- d) exponential growth

27. Secondary sexual characteristics are often considered a handicap because of increased

- a) predation.
- b) competition.
- c) parasitism.
- d) infertility.
- e) all of the above.

28. Which term best describes the process in which nitrogen is released as NH_4^+ ?

- a) nitrification
- b) ammonification
- c) actinomycetes
- d) decomposition
- e) hydration

29. Which of the following is NOT a measurement of primary productivity?

- a) oxygen production
- b) amount of decomposition
- c) amount of biomass
- d) carbon uptake by producers

30. The age distribution of a population can reveal

- a) growth potential.
- b) survivorship.
- c) reproduction.
- d) both growth potential and survivorship.
- e) growth potential, survivorship and reproduction.

II. 解釋名詞(中文或英文作答皆可，請在答案紙作答，先抄題號及題目後，再寫答案。共 10 題，4 分/題，計 40 分)。

1. 生態系(ecosystem)
2. 生態過渡區(ecotone)
3. 共同演化(coevolution)
4. 互利共生(mutualism)
5. 自疏現象(self-thinning)
6. 生物質量(biomass)
7. 優養化(eutrophication)

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- 8. 初級生產量(primary production)
- 9. 馴化(acclimation)
- 10. 族群(population)

III. 申論題 (共 1 題，15 分/題，計 15 分，請在答案紙作答，不須抄題)

請詳細討論載運石油的貨輪，在海岸擱淺漏油後，漏出的石油，對該區域生態可能造成的影響有那些。