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KATHMANDU UNIVERSITY
End Semester Examination
March, 2025

Marks Scored:

Level : B.Sc.
Year : II

Course : ENVS 206
Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date : 24 MAR 2025

SECTION "A"

[22 Q. × 0.5 = 11 marks]

Choose and mark [X] encircle the most appropriate option from each set of choices

1. A nucleotide contains
   [ ] purine/pyrimidine, pentose sugar and a phosphate
   [ ] pyrimidine, pentose sugar and a phosphate
   [ ] purine, pentose sugar and a phosphate
   [ ] purine/pyrimidine and a phosphate

2. Which of the following is considered as an important parameter for describing mountains?
   [ ] Coldness [ ] Elevation [ ] Ruggedness [ ] Windiness

3. Which of the following is correct?
   [ ] α, β and γ diversities are related with species distribution in different ecosystems.
   [ ] α, β and γ diversities are related with genetic diversity in different populations.
   [ ] α, β and γ diversities are related with genetic diversity within a population.
   [ ] α, β and γ diversities are related with relative abundance of in different ecosystems.

4. Theft of biological materials including genetic materials through patenting is called
   [ ] bioprospecting [ ] biopiracy [ ] bioremediation [ ] bioturbation

5. Which of the following statement is false?
   [ ] Alleles are alternative forms of genes
   [ ] Alleles are always equally expressed
   [ ] Alleles illustrate genetic diversity
   [ ] Alleles occupy different loci on homologous chromosomes

6. The differences in nutrient flow and storage in different environmental components is best illustrated by
   [ ] Gibbs diagrams [ ] Gersmehl diagrams
   [ ] Piper diagrams [ ] Venn diagrams

7. *Tuatara* is found only in New Zealand. Therefore, this taxon is a/an
   [ ] rare species [ ] endemic species
   [ ] common species [ ] invasive species

8. Allicin present in garlic possesses anti-micro-bacterial properties. Therefore, allicin is a/an
   [ ] active principle [ ] prosthetic group
   [ ] drug [ ] hallucinogen

9. The Red Data Book is published by the
   [ ] UNDP [ ] UNEP [ ] WWF [ ] IUCN

10. A taxon containing only one immediately sub-ordinate taxon is referred to as
[ ] monotypic species [ ] monotypic taxon
[ ] rare taxon [ ] extant taxon

11. _____ states that the latitudinal ranges of plants and animals are generally smaller at lower latitudes than at higher latitudes.
[ ] Rapoport's Rule [ ] Allen's Rule
[ ] Bergmann's Rule [ ] Jordan's Rule

12. The highest biomass contribution in tropical rain forests comes from
[ ] moss [ ] vascular plants
[ ] mammals [ ] reptiles

13. The bullet train in Japan was inspired by
[ ] hornbill [ ] peacock [ ] kingfisher [ ] toucan

14. Lemur biodiversity is highest in
[ ] Madagascar [ ] Sundaland [ ] Japan [ ] Philippines

15. The kimono prints in Japan take inspiration from
[ ] Komodo dragons [ ] Butterflies
[ ] Royal Bengal tigers [ ] Termites

16. Nepal lies in
[ ] Neotropical realm [ ] Indo-Malayan realm
[ ] Afrotropical realm [ ] Nearctic realm

17. *Drosophila persimilis* and *Drosophila pseudoobscura* look identical but fail to interbreed. Therefore, these species represent
[ ] ring species [ ] relict species [ ] sibling species [ ] pseudospecies

18. The only great ape found in Asia are the
[ ] chimpanzees [ ] orangutans [ ] gorillas [ ] bonobos

19. The most severe mass extinction occurred in the
[ ] Silurian period [ ] Permian period
[ ] Devonian period [ ] Ordovician period

20. Which of the following acts as the raw material for evolution?
[ ] genes [ ] populations [ ] communities [ ] nucleotides

21. Which of the following is ecosystem services of biodiversity is illustrated by sacred groves?
[ ] Cultural services [ ] Regulatory services
[ ] Provisioning services [ ] Supporting services

22. Assessment of pharmaceutical properties of plants comes under
[ ] Biopiracy [ ] Bioprospecting
[ ] Biopatenting [ ] Biotechnology

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SECTION "B"

[6 Q. × 0.5 = 3 marks]

Look at the following scientific names and answer the following questions:

a. *Bison bison*
b. *Acacia acuminata acuminata*
c. *Cryptomeria japonica*
d. *Cymbella japonica* (Reichelt) Jüttner, Cox, Krammer & Tuji

23. Which one is an animal species?
[ ] a [ ] b [ ] c [ ] d

24. Which one is a tautonym?
[ ] a [ ] b [ ] c [ ] d

25. Which one represents a sub-species?
[ ] a [ ] b [ ] c [ ] d

26. Which one is not a binomen?
[ ] a [ ] b [ ] c [ ] d

27. Which one represents a basionym?
[ ] a [ ] b [ ] c [ ] d

28. Taxonomic trail is reflected in
[ ] a [ ] b [ ] c [ ] d

SECTION "C"

[12 Q. × 0.5 = 6 marks]

Fill in the blanks:

29. The pre-historic landmasses formed from splitting of the Pangea are _____ and _____.

30. A contiguous population without barriers to gene flow except at one location with co-occurrence of two reproductively isolated populations is referred to as _____.

31. The total number of megadiversity countries is _____

32. The elevation beyond which trees are absent is called _____

33. Total number of ecosystems found in Nepal is _____

34. The full form of ICIMOD is _____

35. The purine bases of nucleic acids are _____ and _____.

36. Identical generic and specific names of a taxon is referred to as a _____.

37. Speciation attributed to natural barrier is referred to as _____.

38. The region(s) where a crop is believed to have originated is/are called _____.

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SECTION "D"

[3 Q. × 7 = 21 marks]

1. Define biogeographical realms. Give an account of the present-day biogeographical realms and explaining the distribution of biodiversity. [1+3+3=7]

2. Define and list the uncharted realms of biodiversity. Give an account of at least two uncharted realms of biodiversity explaining their significance. [2+5=7]

3. Give an account of any three species concept you have studied. Add a note on the advantages and disadvantages of each of these concepts. [4.5+2.5=7]

SECTION "E"

4. Differentiate between (***ANY FIVE***) [5Q × 2=10]
   a. Balance and Imbalance Theories of biodiversity distribution
   b. Allen's Rule and Bergmann's Rule
   c. Flagship species and Umbrella species
   d. Yellow biotechnology and white biotechnology
   e. Alpha diversity and Beta diversity

5. Assign the scientific names, the Family and the important value of the following: [8 Q × 0.5=4]
   a. Turmeric
   b. Tomato
   c. Saffron
   d. Rose
   e. Teak
   f. Camphor
   g. Wheat
   h. Mango

6. Give reasons why (***ANY FIVE***) [5Q × 2=10]
   a. Tropical forest soils have less fertility.
   b. Plants have higher levels of endemism than animals.
   c. Large animals are vulnerable to extinction.
   d. Mountains are rich in biodiversity.
   e. Plant endemicity is higher than animal endemicity
   f. Hybrids are not given the status of species.

7. Write short notes on (***ANY TWO***) [2Q × 3=6]
   a. Values of biodiversity
   b. Significance of wetlands
   c. Biodiversity hotspots

8. Give a brief account the Janzen-Connell hypothesis. [4]