KATHMANDU UNIVERSITY
End Semester Examination
March/April, 2017

Marks Scored:

Level : B. Sc.
Year : IV

Course : ENVS 415
Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date : APR 13 2017

SECTION "A"
[17 Q. × 0.5= 8.5 marks]

Choose and mark (X) against the correct answer:

1. First text book on Limnology was written by
[ ] Odum [ ] Forel [ ] Hutchinson [ ] Forbes

2. Taxa that are pollution sensitive are also called
[ ] mesosaprobic taxa [ ] xenosaprobic taxa
[ ] polysaprobic taxa [ ] oligosaprobic taxa

3. "Annie", "Fannie" and "Mike" belong to
[ ] Chlorophyceae [ ] Rhodophyceae
[ ] Bacillariophyceae [ ] Cyanophyceae

4. Which of the following statement is correct?
[ ] Clinograde oxygen profile is characteristic of oligotrophic lakes
[ ] Clinograde oxygen profile is characteristic of eutrophic lakes
[ ] Orthograde oxygen profile is characteristic of dystrophic lakes
[ ] Orthograde oxygen profile is characteristic of dystrophic lakes

5. Hydrothermal vents are characterized by
[ ] high pH values and high temperatures [ ] low pH values and high temperatures
[ ] high pH values and low temperatures [ ] low pH values and low temperatures

6. Epiphytic diatoms are found on
[ ] macrophytes [ ] rocks [ ] bryophytes [ ] sediments

7. Free swimmers in aquatic ecosystems represent
[ ] planktons [ ] nektons [ ] periphytons [ ] neustons

8. Rift Valley lakes are
[ ] calderas [ ] tectonic lakes [ ] solution lakes [ ] artificial lakes

9. Water residence time is in the order of
[ ] oceans > lakes > rivers [ ] oceans > rivers > lakes
[ ] rivers> oceans > lakes [ ] lakes > rivers > oceans

10. The column of marine water lying above the continental shelf is referred to as
[ ] pelagic zone [ ] neritic zone [ ] bathayal zone [ ] abyssal zone

11. Mangroves represent
[ ] epiphytes [ ] hydrophytes [ ] halophytes [ ] xerophytes

12. During the El Niño event, the thermocline depth is
[ ] reduced causing downwelling [ ] increased causing downwelling
[ ] reduced causing upwelling [ ] increased causing upwelling

13. Microbial aided conversion of N_2 to NH_3 is called
[ ] Nitrification [ ] Denitrification [ ] Ammonification [ ] Nitrogen fixation

14. The deepest parts of the ocean is called
[ ] neritic zone [ ] pelagic zone [ ] hadal zone [ ] bathayal zone

15. Higher concentration of oxygen in the metalimnion reflects a
[ ] clinograde profile [ ] orthograde profile
[ ] positive heterograde profile [ ] negative heterograde profile

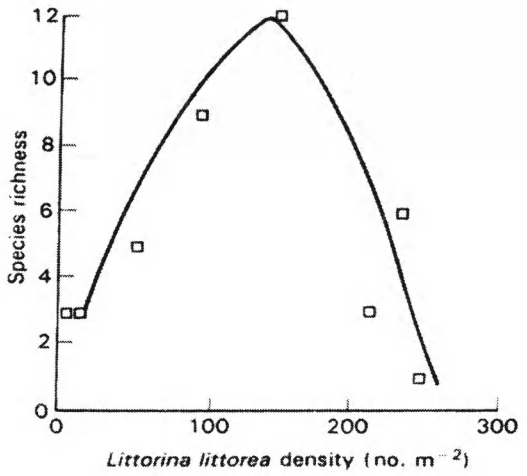
16. Which of the following is not a coastal ecosystem?
[ ] Fjord [ ] Delta [ ] Estuary [ ] Floodplain

17. Maintenance of reduced densities of populations by predators reflect
[ ] competition [ ] co-existence
[ ] resource partitioning [ ] exploiter-mediated co-existence

SECTION "B"

[2Q × 0.75 = 1.5 marks]

The following graph shows the algal species richness on the Y axis and density of a predatory snail on the X axis.



18. Explain why algal species richness is low when the predator density is also low.

_____
_____
_____
_____
_____
_____
_____
_____.

19. Explain why the algal diversity reaches the maximum when the predator density is moderate and it crashes when the predator density is the highest.

_____
_____
_____
_____
_____
_____
_____
_____
_____.

SECTION "C"
[10 marks]

Fill in the blanks:

20. _____, _____, _____ and _____ are considered as the major cations in freshwater systems.

21. Light and Dark Bottle Method is used to measure _____.

22. The instrument used to measure the surface area of a lake is called _____.

23. BWMP is based on _____.

24 The phenomenon of bio-chemical emission of light in deep waters is called _____.

25. The most common form of iron in natural waters is _____.

26. The full form of NEPBIOS/ASPT is _____.

27. The upstream and downstream physico-chemical and biological differences resulted due to dam construction is best explained by _____ Concept.

28. Headwater rivers generally belong to _____ stream orders.

29. Krill is the food of _____.

30. Z_{max} represents the _____.

31. The uppermost layer of lake water where maximum sunlight penetration can occur is referred to as _____.

32. _____ are the most recent Ramsar sites in Nepal.

33. _____ is the branch of Limnology that deals with the reconstruction of past environmental conditions.

34. Waters of the rock dominant end of the spectrum in the Gibb's diagram are rich in _____ and _____.

35. Exchange of gases between the atmosphere and the ocean surface is best explained by _____.

KATHMANDU UNIVERSITY
End Semester Examination
March/April, 2017

APR 1 3 2017

Level : B. Sc.
Year : IV
Time : 2 hrs. 30 mins.

Course : ENVS 415
Semester : I
F. M. :55

SECTION "D"
[3 Q. × 7 = 21 marks]

Answer *ANY THREE* of the following:

1. Give an account of the criticisms of the River Continuum Concept with appropriate examples.

2. List at least three each of lake morphometric and physico-chemical features. Explain the importance of these features in aquaculture and lake management.

3. Describe the anthropogenic impacts on aquatic ecosystems with suitable examples.

4. Give an account of the patch dynamics models with appropriate examples.

SECTION "E"

5. Write short notes on (*ANY FOUR*) [4Q × 2 = 8]
   a. Macroinvertebrate functional feeding groups
   b. Marine zonation
   c. Chemolithotrophy
   d. Types of lakes based on nutrient concentration

6. Differentiate between (*ANY FOUR*) [4Q × 2 = 8]
   a. Dominance controlled and Founder controlled patch dynamics
   b. Thermocline and nutricline
   c. Ammonification and denitrification
   d. Hilsenhoff Index and NEPBIOS
   e. Top down control and bottom up control

7. Give an account of (*ANY THREE*) [3Q × 4 =12]
   a. Water residence time
   b. Ecosystem services of rivers
   c. Silica cycle in lakes
   d. Significance of headwaters

8. Give reasons for the following statements: [4Q × 1.5 = 6]
   a. Freshwater fishes excrete copious amounts of urine.
   b. Floating macrophytes suppress the growth of the submergent macrophytes.
   c. High mountain freshwater bodies are often oligotrophic
   d. El Niño affects productivity in the Pacific Ocean.