16/12/2015

School of Environment and Natural Resources
Doon University
Dehradun, Uttarakhand
Question Paper: End Semester Examination

M. Tech. Environmental Technology (First Semester) | Session: Aug 2015 – Dec 2015
Course: Fundamentals of Biological Processes & Environmental Engineering | Course Code: ETC-500
Maximum Marks: 30 | Maximum Time: 3:00 Hrs

Section A: Give answers to any ten questions: **(Marks: 10 × 1 = 10)**

(i) What are ecological pyramids?

(ii) Write Monod and Michaelis-Menten equation.

(iii) What is fast carbon cycle?

(iv) Anammox bacteria directly convert ammonia to nitrogen gas by using ..... as an electron acceptor under anaerobic conditions.

(v) Aromatic amino acids absorb UV light at .....nm wavelength.

(vi) What is Lindermann's law of 10%?

(vii) The following eukarya .....act to "polish" effluent streams by helping to cleanse them of fine particulate materials.

(viii) Write two characteristics feature of food web.

(ix) Differentiate "anoxic" and "anaerobic" conditions.

(x) What are epimers? What is cell potential?

(xi) Calculate the number of mol of ammonia NH_3 required to produce 5.0 mol of $Cu(NH_3)_4SO_4$ according to the equation:

$CuSO_4 + 4NH_3 \rightarrow Cu(NH_3)_4SO_4$

Section B: Give answers to any five questions: **(Marks: 4 × 5 = 20)**

a) Discuss various environmental applications of enzymes.

b) What are the characteristic and differing features of Bacteria, Archaea and Eukarya.

c) Describe in brief (any one): (1) Photosynthesis; (2) Constructed wetlands; (3) Composting

d) Draw the basic structure of DNA and RNA. Indicate phosphodiester bond, glycosidic linkage and anomeric carbon in it.

e) What are polysaccharides? Discuss any one polysaccharide in brief.

f) What is the difference between elementary and complex reaction. Write the differential rate equation for the following reactions, assuming them to be elementary reactions:

$A + 2B + 3C \rightarrow$ Products

$A + 3B \rightarrow 2C + D + 2E$