2020
Zoology
M.Sc. Fourth Semester Examination
ZCT 432
(Applied Ecology)
Full Marks 40
*Answer **any four** of the following questions*

Q1. (a) Mention the characteristics of an invasive species. How would you differentiate between an exotic species and an invasive species?
(b) Cite an example in support of 'increased competitive ability' hypothesis..
(c) Represent through a diagram the various filters that an invasive species has to overcome for establishment in non-native habitats.

(2+2) +3 +3 =10

Q2. (a) 'Biostimulation and biaugmentation are two different bioremediation strategies' – Explain.
(b) Elaborate the role of plant hyperaccumulators in heavy metal bioremediation of freshwater ecosystem.
(c) What is phycoremediation?

(2+2) + 4 +2 =10

Q3. (a) Outline the various facets of functional diversity.
(b) Mention the links between biodiversity and ecosystem services.
(c) Write about the principles and significance of life cycle assessment.

3+3+4 = 10

Q4. (a) Elucidate the concepts of biocapacity accounting and ecological footprint analysis.
(b) Write short notes on 'ecological debt' and 'ecological deficit'.
(c) Enumerate the factors that influence ecological overshoot.

(2+2) + (2+2) + 2 = 10

Q5. (a) Justify 'sterile insect technique' and 'push-pull strategy' as effective biological control strategies against vector insects and agricultural pests respectively.
(b) Discuss about the effective management strategies to reduce the impact of the golden apple snail *Pomacea canaliculata* as a rice pest in Southeast Asia.

(3+3) + 4 = 10

Q6. (a) Any harvested population must decline in abundance and losses must be compensated for by increased growth, increased reproduction or decreased natural mortality. How do you deduce this relationship with mathematical equation to represent stability at any level of population?

(b) How can you obtain 'Maximum Sustainable Yield' using the sigmoid theory?

5 + 5 =10

Q7. (a) Assume that two points on the Stock- Recruitment Curve are fixed, 1) where there is no stock, there is no recruitment 2) the point at which stock equals recruitment is an equilibrium point. Now, given these two fixed points, compare stock-recruitment curves based on Beverton- Holt model and Ricker's model and discuss the variability within it.

6 + 4 = 10

Q8. (a) How is active ecological restoration strategy different from passive ecological restoration strategy? Cite an example of food web based ecological restoration strategy.

(b) What is revitalization?

(c) Successful accomplishment of ecological restoration would require the application of the theory of ecological succession.' – Explain this statement in view of the links between ecological restoration and ecological succession.

(3+1) +2 +4 =10