



8-12-2017

School of Environment & Natural Resources (SENR)

M.Tech. (1st Sem)

EGC - 596

End-Semester 2017

Computational Methods in Environmental Science (Theory)

Max Marks : 25

Time : 1.5 hour

Answer any FIVE questions

(5 x 5 =25)

NOT more than FOUR questions to be answered from Section A

NOT more than TWO questions to be answered from Section B

Section A :

1. What do you understand by bisection method as a numerical solution method? Explain.
2. Explain iteration method with an example.
3. What is Newton-Raphson method? Illustrate with an example.
4. What is Newton's forward method for interpolation. How and where are these used?
5. What is Lagrange's interpolation method? Illustrate with an example.
6. Explain Runge-Kutta method of second order to solve an ordinary differential equation.

Section B :

7. Explain Gaussian plume model. What is the significance of σ_y and σ_z ? Explain the relation between downwind concentration and downward distance.
8. What do you understand by LULC model? Illustrate with an example.
9. What is BOD₅ ? Describe Galler-Gottas method to evaluate effluent BOD₅ concentration.
10. Explain exponential and logistic growth model of population.
11. What is Lotka-Volterra Model? Explain.
12. What is Monte-Carlo simulation? Illustrate with an example.
13. How does temperature and pressure with altitude in the atmosphere?
14. What is boundary layer height? How is it determined?
15. What is Oxygen sag curve (Streeter Phelps Oxygen Sag model)? Explain.
16. What is radiative forcing? How are the radiative forcing and green house gases concentration related to each other?
17. Describe the method of evaluating the settling velocity for a sand particle in a mixing tank for the waste water treatment.
18. What is Galler-Gottas method to evaluate BOD₅ of a mixing tank?