

23-12-2015



DOON UNIVERSITY, DEHRADUN

Final Semester Examination, 2015

School of Environment & Natural Resources

PhD (Environmental Studies), 1st Semester

Course: EES – 618: Analytical Techniques and Instrumentation

Time Allowed: 3 Hours

Maximum Marks: 30

Attempt All Questions from Sections A,B,C.

Note: WRITE CLEARLY YOUR QUESTION NUMBER WHILE ANSWERING TO IT.

SECTION: A (Short Answer Type Questions/ to be answered in about max 50 words).

Attempt any TEN questions.

(Marks: 1 x 10=10)

1. Name a classical separation technique.
2. Write the name of a Complexing agent.
3. The intensity of transmitted light is observed in technique.
4. The conductance C, of a salt solution, with its dilution.
5. According to Beer's law the Absorbance (A) with an increase in concentration.
6. The flame test is a technique.
7. The 'Glass Electrode' is used for.
8. How can you correct a determinate error?
9. Calculate the weight of Na present in 50.0 g of Na₂SO₄.
10. What is the use of Calomel electrode?
11. Which metals can be analysed with a flame photometer.

SECTION: B (Medium Answer Type Questions to be answered in about 100 words).

Attempt any FIVE questions.

(Marks: 2 x 5=10)

1. What is the difference between Precision and Accuracy?
2. What is the difference between Qualitative and Quantitative Analytical technique? Explain with examples.
3. The tin and zinc contents of a brass sample are analyzed with the following results: (a) Zn: 33.27, 33.37, and 33.34% and (b) Sn: 0.022, 0.025 and 0.026%. Calculate the standard deviation in each analysis.
4. A 26 g sample of plant tissue was analyzed and found to contain 5 µg of Iron. What is the concentration of Iron in the plant in ppm and in ppb?
5. Draw a neat diagram, with labels, of Glass electrode.
6. Draw a titration curve between a weak acid and Strong Base.

SECTION: C (Large Answer Type Questions to be answered in about 150 words).

Attempt any two questions.

(Marks: 5 x 2 =10)

1. What is Conductometry, and what are the factors affected the conductance of a solution?
2. What are the main characteristics of UV-Visible Spectrophotometry? Please draw its instrumentation and give two applications.
3. What is a photometric technique? Please draw the instrumentation of Nephelometry and Turbidimetry, and give two main differences between them.