

28-5-013



DOON UNIVERSITY, DEHRADUN
Semester Final Examination, Second Semester, 2013
School of Environment & Natural Resources

M.Sc. Environmental Science (NRM)
Course: ENR – 515: Integrated Watershed Management

Time Allowed:-2 Hours

Maximum Marks: 30

Note: Attempt All Questions from Sections A, B, and C

SECTION: A (Short Answer Type Questions/ to be answered in about 25 words.

Attempt any FIVE Questions.

(Marks: 1 x 5=5)

1. Write down name of various forms of precipitation
2. Differentiate between watershed first and second order of stream
3. Draw a second order stream watershed
4. 10 millimetre rain fall per hectare is equal to-----cubic meter
5. Differentiate between evaporation and transpiration
6. Importance of soil depth
7. Differentiate between soil and land

SECTION: B (Short Answer Type Questions to be answered in about 250 words.

Attempt any FOUR Questions.

(Marks: 2.5 x 4=10)

1. Explain infiltration and its relevance in runoff
2. Explain in detail the requirement of watershed map
3. Write down the various component of bio industrial watershed
4. Write down few watershed characteristic influencing runoff and explain any two
5. Importance of perennial vegetation in minimizing soil loss
6. Explain Integrated Watershed Development programme

SECTION: C (Long Answer Type Questions to be answered in about 750 words.

Attempt any TWO Questions.

(Marks: 7.5 x 2=15)

1. Write down various data seta required in developing Watershed Development Programme and explain in detail any two of them.
2. Write down questionnaire for collection of socio-economic condition of the farmers.
3. Explain the necessity and usefulness of ground water recharge in the context of climate change and Watershed Development Programme.
4. What is probability? Explain this with the example of annual rainfall data.



DOON UNIVERSITY, DEHRADUN
Semester Final Examination, Second Semester, 2013
School of Environment & Natural Resources
M.Sc. (Environmental Studies and Natural Resources)
Course: EES – 518: Analytical Techniques and Instrumentation

Time Allowed: 3Hour

Maximum Marks: 30

Note: Attempt Questions from Sections A,B,C. Graph sheet is required..

SECTION: A (Objective Type Questions. Attempt All Questions. (Marks: 1 X 1=10)

1. In ICP Plasma Discharge is generated by
 - a) Magnetic Field Generator
 - b) Electric Field Generator
 - c) Rotational Frequency Generator
 - d) Radio Frequency Generator
2. A Plasma in ICP consists of
 - a) Electron, Proton and Neutral molecules
 - b) Electron and Proton
 - c) Electron and Neutral molecules
 - d) Only Electron
3. To achieve the Temperature 3000 °C in AAS, the fuel system is used
 - a) Hydrogen-Acetylene
 - b) Acetylene-Nitrous oxide
 - c) Air-Propane
 - d) Hydrogen-Air
4. Correct wavelength range for UV is
 - a) 120 nm – 380 nm
 - b) 150 nm – 400 nm
 - c) 180 nm – 400 nm
 - d) 200 nm – 400 nm
5. Scanning Electron Microscopy used to determine the
 - a) Surface Morphology of Solid Materials
 - b) Surface Morphology of Semisolid Materials
 - c) Surface Morphology of all kind of Materials
6. Refractive Index Detector is used in
 - a) GC
 - b) ICP
 - c) HPLC
 - d) TLC
7. Phenolphthalein is a
 - a) Basic Indicator
 - b) Acidic Indicator
 - c) Neutral Indicator
 - d) Buffer Indicator
8. The correct increasing order of the energy required for these transitions
 - 1) $n-\pi^*$
 - 2) $\pi-\pi^*$
 - 3) $\sigma-\sigma^*$
 - 4) $n-\sigma^*$
 - a) $1 < 2 < 4 < 3$
 - b) $1 < 3 < 2 < 4$
 - c) $2 < 4 < 1 < 3$
 - d) $4 < 2 < 3 < 1$
9. The pH range for Methyl Orange Indicator is
 - a) pH 4.2 to pH 6.0
 - b) pH 3.2 to pH 6.0
 - c) pH 3.2 to pH 4.2
 - d) pH 6.0 to pH 10.0
10. Surface morphology of a membrane is analysed by
 - a) Atomic Force Microscopy
 - b) Atomic Emission Microscopy
 - c) Atomic Electron Microscopy
 - d) Atomic Neutron Microscopy

SECTION: B (Short Answer Type Questions to be answered in about 50-75 words. Attempt any Four Questions. (Marks: 2X 5=10)

- Equal Volume of Phenol, dichlorophenol and trichlorophenol were chromatographed, the area found under each peak were 36.36, 27.55 and 17.45 cm². Assume that the detector response is equal, calculate the percentage composition of the mixture.
- A 8.00 X 10⁻⁴ M solution of an organic compound was kept in a UV cell having a path length of 2.00 cm. When exposed to a wavelength of 400 nm, the absorbance of the solution is found to be 0.845. What is the molar absorptivity of organic compound at this wavelength?
- Define "interference" in atomic absorption spectrometry and classify them? Discuss any one of them and explain how it will be rectified?
- A student prepared standard lead solutions for comparison and the absorbance of each solution was measured. A road-side soil sample was also prepared. The results are shown in the table below.

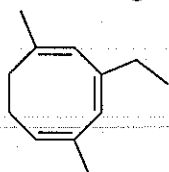
Sample	Concentration (ppm)	Absorbance
Blank	0.00	0.00
Standard 1	1.00	0.17
Standard 2	2.00	0.34
Standard 3	3.00	0.48
Standard 4	4.00	0.65
Standard 5	5.00	0.83
Unknown Sample	?	0.58

Calculate the concentration of unknown sample.

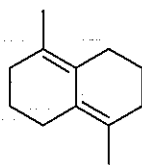
- (a) Calculate the wave length of the resonance line of the sodium atom if the excitation energy of resonance level is 2.10 eV. (Given $hc = 12,300$)
(b) Explain transmittance and absorbance. Calculate the absorbance of a given sample having transmittance 25%.
- (a) Commercially available concentrated hydrochloric acid is 37.0% w/w HCl. Its density is 1.18 g/mL. Using this information calculate the Molarity of concentrated HCl. (H= 1, Cl=35.5)
(b) List out the factors that affect the separation of compounds in GC.

SECTION: C (Descriptive Type Questions to be answered in about 150-200 words. Attempt any Two Questions. (Marks: 5X 2=10)

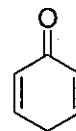
- Discuss the Principle and Instrumentation of Inductively Coupled Plasma?
- Calculate the λ_{\max} for the following compounds.



(a)



(b)



(c)

- Give the instrumental details of Atomic Absorption Spectrophotometer with explaining its components.
- a) Which law leads the UV-Visible spectroscopy? Write down the total range of UV-Visible. Write down the various possible electronic transitions for a molecule arranging them in order of their increasing order.
b) Give the instrumental detail of UV Spectrophotometer.