

Soil and Plant Analysis

www.anilrana13014.weebly.com

www.k8449r.weebly.com

6. Vertically oriented pillar, flat top shape is found in structure.
 (a) Platy (b) Prismatic (c) Blocky (d) Spheroidal
7. Which of the following is not a chelating agent?
 (a) DTPA (b) EDTA (c) TEA (d) Citric acid
8. A substance added to a solution to locate the end point in titration.....
 (a) Buffer (b) indicator (c) thinner (d) starter
9. While collecting soil sample with khurpi, a shape cut is made to a depth of 15-18 cm.
 (a) U (b) V (c) W (d) D
10. Percent = ppm x
 (a) 10^{-2} (b) 10^{-3} (c) 10^{-4} (d) 10^{-5}

Q. 4: Match the followings:

7.0

a	$H_3P(MoO_{10})_4$	Sharp end point
b	Calcon indicator	Mohr's salt
c	$K_2SO_4 \cdot CuSO_4 \cdot 5H_2O$, Se	Available K estimation
d	H_3PO_4	Heteropoly complex during P estimation
e	Ammonium acetate N pH 7	Available S estimation
f	Barium chloride with gum acacia	Catalyst
g	0.5 N Ferrous Ammonium Sulphate	Ca estimation

PART- B

Q. No. 1: Answer in brief any four of the following:

- Why we take soil sample in zig-zag manner?
- What is a soil test extractant?
- What is Darco G 60? Give its role in av. P determination?
- What is radioactivity?
- What is standardization?

Q. No. 2: Differentiate any four of the following

- Molarity and Normality
- Accuracy and precision
- Isotopes and isobars
- Primary solution and secondary solution
- Colorimeter and spectrophotometer
- 'Olsen reagent and method' and 'Bray reagent and method'
- Saline and alkali soils

Q. No. 3: Explain any three of the following:

- Soil tensiometer working, limitations, installation
- Collection, processing and storage of plant samples
- pH- importance in plant nutrition
- What is soil test? Define objectives of soil testing
- Prepare chromic acid solution. What is the role and precautions of chromic acid solution?

Q. No. 4: Write down the principle of the following with suitable equation and reaction.

- attempt any three of the following:
- Soil acidity remediation with agricultural lime
 - DTPA extraction for micronutrient
 - Available N
 - Available P

Burnt lime is ordinarily
is produced

V.C.S.G. College of Horticulture, (UHF) Bharsar, Pauri Garhwal (Uttarakhand)-246123
Final Examination B.Sc. (Hort.) II Semester (2014-15)

Course Title: Soil and Plant Analysis
Credit Hours: 2(1-0-1)
Date of Exam:
Id. No.:
Maximum Marks: 50
Course No: HNS (102)
Max. Marks: 50.00
Total Time: 3 Hours

Note: All questions to be attempted. Cutting and overwriting is not allowed.
Write the answer of the questions from 1 to 4 on the paper.

PART- A

- Q. No. 1: Fill in the blanks, each of 0.50 mark. 4.0
- a) Father of soil testing is
 - c) Equivalent weight (g) = Molecular weight /
 - d) TEA reagent used in
 - e) SMP buffer method is used for analysis of
 - f) A triple acid digestion mixture (HNO_3 , H_2SO_4 , HClO_4) for plant sample digestion is prepared by mixing them in the ratio of
 - g) For plant sample drying temperature of hot air oven temperature should be..... C.
 - h) Cuvette is used in
 - i) The estimation of organic carbon is done by.....method.

- Q. 2: True/False, each of 0.50 mark. 4.0
- a) Critical level range for potassium in medium category is 113-280kg K/ha.
 - b) Hot water is used for chloride determination in soil.
 - c) For soil pH determination we take Soil water in the ratio of 1: 2.5
 - d) VAM can fix atmospheric nitrogen in rhizosphere.
 - e) Soil aeration is described by Fick's law.
 - f) Dry ashing of plant material at 500°C for 3-4 hours is carried out in Kjeldahl digestion block.
 - g) Among macronutrients, calcium is highly deficient in Indian soils.
 - h) In intensive cropping system soil micronutrient deficiency is expected.

- Q. 3: Tick (✓) the correct answer, each of 0.50 mark. 5.0
1. Beer-Lambert's law is used in
- (a) Absorption spectrophotometer
 - (b) Atomic emission spectrophotometer
 - (c) Flame photometer
 - (d) Ion chromatography
2. What is known as the universal solvent?
- (a) Sulphuric acid
 - (b) Hydrochloric acid
 - (c) Water
 - (d) Aqua Regia
3. Soil crusting is a form of soil
- (a) Compaction
 - (b) Structure
 - (c) texture
 - (d) Consistency
4. Teepol is
- (a) liquid detergent soap
 - (b) A type of soil auger
 - (c) Organic manure
 - (d) Neem soap
5. In potato, we take
- (a) flag
 - (b) 3rd from apex
 - (c) most recent fully developed half grown
 - (d) 3-5 month old

- g) During soil sampling we collect several compositional samples and prepare a primary sample for analysis.
 h) In intensive cropping system soil micronutrient deficiency is expected.
 i) Soil pH concept was given by
 j) Soil grinding purpose we use

Q. 3: Tick (✓) the correct answer, each of 0.50 mark. 1.0

1. During nitrogen estimation we trap ammonia in
 (a) Acetic acid (b) Boric acid (c) Ascorbic acid (d) Ammonium molybdate
2. Aqua Regia universal solvent is
 (a) 3 part HNO₃ + 1 part HCl
 (b) 1 part H₂SO₄ + 1 part HCl
 (c) 3 part HNO₃ + 1 part H₂SO₄
 (d) 1 part HNO₃ + 1 part H₂SO₄
3. Ammonium acetate 1.0 N pH 7.0 is an extractant for
 (a) Soil N (b) Soil P (c) Soil K (d) Soil Ca
4. Grease from glassware like stopcock of burette can be cleaned by
 (a) liquid detergent soap (b) Chromic acid mixture (c) H₂SO₄ (d) Benzene or methylated KOH
5. Ammonium oxalate pH 3.3 used for analysis of molybdenum (Mo) is known as
 (a) Girga's reagent (b) Brick's reagent (c) Olsen's reagent (d) Bray's no 1 reagent
6. DTPA (Diethylene Triamine Penta Acetic acid) extractant pH 7.3 used for analysis of micronutrient can
 Cu, Mn and Fe first given by
 (a) Irving's reagent (b) Brick's reagent (c) Lindsay and Norwell (d) Bray's no 2 reagent
7. Total nitrogen of soil can be judged by which of the following instrument?
 (a) Kjeldahl (KEL plus) (b) Spectrophotometer (c) Flame photometer (d) Emission spectrophotometer
8. Which of the following is not a chelating agent?
 (a) DTPA (b) EDTA (c) TEA (d) Citric acid
9. Ferrrous Ammonium Sulphate is also known as
 (a) Mohr's salt (b) Griegard's reagent (c) Sorenson's reagent (d) Lambert and Beer's salt
10. Percent = ppm ×
 (a) 10⁻² (b) 10⁻³ (c) 10⁻⁴ (d) 10⁻⁵
11. *Azospirillum brasilense* and *Azospirillum lipoferum* are N-fixing bacteria used for biofertilizer microorganism.
 (a) Rod shaped (b) Cocci (c) Spiral (d) Vibrio comma

Q. 4. Answer

Q. 4. Write down procedure. How do you will prepare of followings?
 (i) 0.1 N NaOH solution (ii) 0.1 N HCl solution (iii) 0.02 H₂SO₄ solution

3 marks