Soil and Plant Analysis

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

Course Title: Soil and Plant Analysis **Course No:** HNS (102)
Credit Hours: 2(1-0-1)
Max. Marks: 30.00
Date of Exam: 31/05/15 **Maximum Marks:** **Total Time:** 3 Hours
Id. No.:.....

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.

Marks distribution
(objective/ short comprehensive questions **10** + viva **5**+ Lab record **5**+ Perform a given lab exercise & write down principle of it **10 = 30)**

PART- A **1.0**

Q. No. 1: Fill in the blanks, each of 0.10 mark.

1. One pH change is equal to change in .....millivolt current.
2. Ortho phosphoric acid (H_3PO_4) during organic carbon determination used for .....
3. Equivalent weight (g) = Molecular weight / .....estimation.
4. TEA reagent used in .....nm.
5. For soil phosphorus estimation we fix wavelength at..... estimation.
6. Barium chloride with gum acacia used in available .....
7. For plant sample drying temperature of hot air oven temperature should be.....°C.
8. $1dSm^{-1}$ is equal to 1 m mho cm^{-1} which is equal to .....ppm or .....% salt
9. Soil available N-$KMnO_4$ shows medium range in between.....kg/ha
10. Soil available K shows medium range in between.....kg/ha
11. The method of estimation of gypsum requirement of saline-sodic/sodic soils was given by Schoonover,1952.
12. It is generally assumed that, on average, OM contains about ..... percent organic C.
13. CRYEMA (Congo red yeast extract mannitol agar) media is .....(microorganism) specific media.
14. **1.0**

Q. 2: True/False, each of 0.10 mark.

a) Higher salt content in soil solution, higher resistance to current flow .....
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) Salt mixture for plant sample digestion is:
20 parts of K_2SO_4 + 1 Part catalyst mixture (20 parts $CuSO_4$ + 1part Se powder) .....
f) Dry ashing of plant material at 500°C for 3-4 hours is carried out in Kjeldahl digestion block.....

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, $CuSO_4.5H_2O$, 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:

i) Why we take soil sample in zig-zag manner?

ii) What is a soil test extractant?

iii) What is Darco G 60? Give its role in av. P determination?

iv) What is radioactivity?

v) What is standardization?

4.00

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

8.00

i) Molarity and Normality

ii) Accuracy and precision

iii) Isotopes and isobars

iv) Primary solution and secondary solution

v) Colorimeter and spectrophotometer

vi) 'Olsen reagent and method' and 'Bray reagent and method'

vii) Saline and alkali soils

9.00

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

(i) Soil tensiometer working, limitations, installation

(ii) Collection, processing and storage of plant samples

(iii) pH importance in plant nutrition

(iv) What is soil test? Define objectives of soil testing

(v) Prepare chromic acid solution. What is the role and precautions of chromic acid solution?

9.00

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

attempt any three of the following:

i) Soil acidity remediation with agricultural lime

ii) DTPA extraction for micronutrient

iii) Available N

iv) Available P