Student I D No..... Date: .....

FIJI NATIONAL UNIVERSITY

COLLEGE OF AGRICULTURE, FISHERIES AND FORESTRY
SCHOOL OF AGRICULTURAL SCIENCES
Department of Soil Science & Agril. Engineering

Bachelor of Science in Agriculture IInd year: Trimester IInd
FINAL EXAMINATION - 2017

SAC 601: SOIL AND WATER CONSERVATION

Time Allowed: 3.10 hours **Total Marks: 100**

INSTRUCTIONS:

This paper consists of five (5) pages. Please check to see that your paper is complete.

Answer all questions in the answer booklet.

- Number your answers correctly in the provided answer booklet.
- Write your student ID number on all pages that you use including any additional sheet paper.
- Printed or written study materials are not allowed into the examination hall.
- Mark values appear at the end of each question or part thereof.
- Calculators are permitted.

"MOBILE PHONES ARE STRICTLY NOT ALLOWED"

SECTION NO.	TYPE	TOTAL MARKS
I	TRUE OR FALSE	15
II	MULTIPLE CHOICE	15
III	FILL IN BLANK	15
IV	DEFINITIONS	15
V	SHORT ANSWER	40
	TOTAL MARKS	**100**

PART I: STATE TRUE OR FALSE

10 x 1.5 =Total 15 marks

1. Saline soils generally possess high amount of soluble salts.
2. LCC (Land Capability Classification)- I is denoted by dark green colour.
3. Boron concentration content up to 3 ppm is safe limit for normal crop growth.
4. Infiltration rate of clay soils is always higher than sandy soils.
5. Fine textured soils are more susceptible to water erosion.
6. The quality of saline waters has been divided into five classes as per USDA classification.
7. The water held between -1/3 and - 15 bar is called field capacity water.
8. Wilting coefficient is the amount of moisture absorbed by a dry soil when placed in contact with atmosphere saturated with water vapour at any given temperature.
9. The process of water entry into the soil through the surface may be either downward of lateral or both is called as percolation.
10. The process that transform the productive land into unproductive land is known as desertization.

PART II : WRITE THE LETTER OF YOUR CHOICE

10 x 1.5 =Total 15 marks

1. Which type of soil erosion is mostly visible?

   A Gully erosion B Wind erosion

   C Splash erosion D All of the above

2. What is the water potential at permanent wilting point (PWP) in soil?

   A -15 bars B 0 bars

   C -31 bars D -1 bars

3. Which one is not used to reduce soil erosion?

   A Mulch B Gravel

   C Residues from previous crop D Animal waste & residues

4. Which is erosion resistant crop out of given?

   A Grasses B Leguminous crops

   C Both 'A' and 'B' D None of the above

5. Soil texture is influenced by percentage of

   A Clay B Silt

   C Sand D All of the above

6. In Universal soil loss equation, A = RKLSCP, where P denotes?

   A Soil erodibility B Predicted soil loss

   C Soil conservation practices D Rainfall factor

7. How many soil orders are there in USDA Soil Taxonomy?

   A 6 B 8

   C 10 D None of the above

8. Growing of erosion resisting and erosion permitting crops on alternate strips of suitable width along the contour and across the slop is called?

   A Contour cropping B Contour strip cropping

   C Contour farming D Strip cropping

9. 10 cm of water column is equal to the pF scale of ?

   A One B Two

   C Three D Four

10. Soil taxonomy soil classification is based on the

    A Properties of soil B Soil fertility

    C Soil microbiology D None of the above

PART III: FILL IN THE BLANK SPACE WITH PROPER WORD

10 x 1.5 =Total 15 marks

1. The pF scale was given by Schofield in the ..... year.
2. 1 bar is equals to ..... atm?
3. A minimum plant residue cover of ---------- is necessary to keep runoff and soil loss within acceptable limit.
4. It is safe to use irrigation water if Sodium Adsorption Ratio (SAR) value is less than ---------- ----------.
5. Total number of land capability classes in the land capability classification system are -------- ----------.
6. Write the measuring unit of infiltration rate ----------.
7. Saltation occurs when particle size is ---------- mm.
8. Leaching of soluble salts from soil either by irrigation water or rain water is called as ..... .
9. Any process which will encourage the build-up of exchangeable bases and reduce soil acidity is known as ..... .
10. Write is the measuring unit of hydraulic conductivity ..... .

SECTION IV: DEFINE THE FOLLOWING

6 x 2.5 = Total 15.0 marks

1) Watershed
2) pF
3) Soil erosion
4) Soil conservation
5) Evapo-transpiration
6) Sodic / Alkali soil

SECTION V

4 X10 = 40 marks

WRITE THE ANSWER FOR GIVEN QUESTIONS

1) A) Demonstrate the major forms of water erosion.

   B) List down the factors affecting water erosion and explain any one in brief.

   C) Compare the agronomical measures of soil conservation.

2. A) What are the criteria's to determine the quality of irrigation water?

   B) Compare the formula to calculate Residual Sodium Carbonate (RSC) and Sodium Adsorption Ratio (SAR).

   C) Demonstrate classes of RSC, SAR and boron content.

3. A) What do you understand by active and reserve acidity of soil?

   B) What are the sources of soil acidity?

   C) Evaluate effect of soil acidity on plant growth and how acidic soils can be managed?

4. A soil sample was collected from CAFF crop farm and given observations were recorded:-

   - Moist Weight of a core sampler = 360 g
   - Dry Weight of a core sampler = 320 g
   - Empty weight of core sampler = 65g
   - Height of core sampler = 6.5 cm
   - Diameter of core sampler =6 cm
   - Particle density = 2.60

   Calculate the given parameters

   A) Bulk density,

   B) Volume of core sampler,

   C) Percent pore space and

   D) Moisture percent.

END OF EXAMINATION PAPER