FNU FIJI NATIONAL UNIVERSITY

COLLEGE OF AGRICULTURE, FISHERIES & FORESTRY
SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL ECONOMIC AND EXTENSION EDUCATION
FINAL EXAMINATION
TRIMESTER 3, 2016

BACHELOR OF SCIENCES (AGRICULTURE) YEAR 1

AEG 502: Surveying, Farm Structures and Processing

Time Allowed : 3 hours plus (10 minutes reading time)

Instructions

1. You are allowed 10 minutes Extra reading time during which you are NOT to write.
2. Begin each Section on a fresh page and use both sides of the sheet.
3. Do not write your name on any answer sheet - only write your Id number in all Answer sheet.
4. Insert all written sheets, graph paper, drawing paper, etc. in their correct sequence And secure with string.
5. For all sheets of paper of which rough/draft work has been done, cross it through And you **MUST ATTACH** to your answer scripts.
6. Write clearly the number(s) of the question(s) attempted on the top of each sheet.
7. Non-programmable calculators are permitted
8. **TOTAL MARKS = 100**

SECTION	DESCRIPTION	Marks
SECTION A	Part I –Fill the Blanks	10
	Part II – True or False	5
	All question in this section are Compulsory	
SECTION B	Short Answer	25
	All question in this section are Compulsory	
SECTION C	Diagrams	10
	All question in this section are Compulsory	
SECTION D	Short calculation	
	All question in this section are Compulsory	20
SECTION E	Long Calculation	
	Answer any **THREE** questions from this section' each question is worth 10 marks	30
	TOTAL	**100**

SECTION A

All questions in this section are Compulsory

PART I   **FILL IN THE BLANKS**   **(10marks)**

1. _____ is a type of surveying in which the directions of surveying lines are determined with a magnetic compass, and the length of the surveying lines are measured with a tape or chain.
2. When a series of connected lines forms a close circuit, it is called a _____
3. _____ is horizontal angle between the reference meridian and the survey line measured in clockwise or anticlockwise direction.
4. When the north end of the magnetic needle is pointed towards the west side of the true meridian the position is termed as _____.
5. _____ is a term used to denote any influence, such as magnetic substances, which prevents the needle from pointing to the magnetic north in a given locality.
6. _____ is a surveying method that measures the angles in a triangle formed by three survey control points.
7. The _____ is defined as a method of determine the relative elevations of points on the surface of earth.
8. A _____ is a line drawn on a map of known ground length and the distances are marked along the line.
9. A _____ indicates the relationship between a certain distance on the map and the corresponding distance on the ground.
10. _____ Caused by wind, temperature, humidity, refraction, gravity, and magnetic declination.

PART II   **TRUE OR FALSE**   **(5 marks)**

On your answer sheet, for each of the following statements write down whether it is **TRUE or FALSE**

1. Trilateration is the principle of compass survey

2. Triangulation refers to the measurement of the angles of the triangle.

3. Fore sight is the first reading taken from a Dumpy level

4 A theodolite measures vertical and horizontal angles.

5. A GPS assists in Navigation

6. The sum or difference between the fore and back bearing is always 180 degrees.

7. Fore bearing is the first reading taken from a dumpy level.

8. Offset is the lateral distance taken from the base line to fix the position of an object

9. The curing period of concrete is 28 days

10. Compass survey is ideal for an area having overhead power lines

SECTION B: SHORT ANSWERS   (25marks)

All questions in this section are Compulsory

1. Explain the principle of compass surveying? **(2marks)**
2. Explain the difference between geodetic and plane surveying? **(2mark)**
3. List any two sources of error in distances measurement? **(2marks)**
4. Explain the difference between surveying and levelling? **(2marks)**
5. What is the principle of chain survey? **(2marks)**
6. List the conditions under which chain survey can be used?**(2marks)**
7. List two documents that have to be submitted to the local authority in order to obtain a building permit? **(2marks)**
8. Explain the difference between open and closed traverse.**(2marks)**
9. List the uses of each of the following instruments? **(3marks)**
    i.   Compass
    ii.   Theodolites
    iii.   Leveling staff
10. List any two uses of surveying in agriculture? **(2marks)**
11. What is purpose of foundation? **(1marks)**
12. Explain the cause's mechanical injury in farm produce? **(1marks)**
13. List any two types of building material that are used in Fiji? **(2marks)**

SECTION C   DIAGRAMS   (10 marks)

All questions in this section are Compulsory

1. Draw a neat sketch of a concrete foundation and show the following with their respective dimensions:

   a) "C" ring
   b) Reinforcement mesh
   c) Starter bar
   d) Damp Proof Course (DPC)
   e) Horizontal bar
   f) Compacted Hard fill
   g) Floor slab

SECTION D   **SHORT CALCULATION**   **(20marks)**

All questions in this section are Compulsory

1. The length of a line was measured with a standard 20m chain and it was recorded as 842m. Later it was found that the chain was 35mm longer than standard. What is the true length of the line? **(2 marks)**

2. A trapezoidal area on a map having a RF scale of 1:10000 measures 75mm , 125mm as top and base width respectively. Calculate the area in hectares if the perpendicular distance between the top and the base is 85mm. **(2marks)**

3. The fore bearing of a line 275°what is it back bearing? **(1mark)**

4. A trapezoidal area on a map having a RF scale of 1:10000 measures 70mm,12Omm as top and base width respectively Calculate the area in hectares if the perpendicular distance between the top and the base is 90mm.**(2 marks)**

5. Calculate the area of a triangle that has got side lengths of 12m,8m,10m.**(2marks)**

6. Convert the following verbal scale to RF scale? **(1mark)**

   1)1cm=7.50m

7. Convert S 18°E degree to Whole Circle Bearing? **(1mark)**
8. Convert 265° to Reduced Bearing (RB) **(1 mark)**

9. For each of the following field distances Select an appropriate RF scale that would fit the given paper size. **(2marks)**

Field Distances	Paper Size	RF Scale
600M	20	
5KM	25	

10. A triangular area has a 15° slope when the slope length is 85m.calculate the horizontal distance Of the Triangle. **(1marks)**

11. A slope distance of 180m was measured of an area having a slope of 35° calculate the vertical Distances? **(1marks)**

12. An included angle of 50° is made by two side of a triangle measuring 28cm and 18cm drawn a scale of 1:500.calculate its area? **(2marks)**

---

13. The Magnetic bearing of a line AB 135° 30' .what will be the true bearing ,if the declination is 50° 15' West? (2marks)

SECTION E   LONG CALCULATION   (30marks)

Answer any THREE questions from this section' each question is worth 10 marks

Question 1

The following perpendicular offsets were taken from a chain line to the boundary of a vegetable field at interval of 12m.Apply trapezoidal Rule, calculate the area between the chain line. (6marks)

4.25, 7 .83, 5.26, 6.45, 7 .33, 7 .87, 8.23, 9 .52, 7 .85

a) Calculate the number of standard concrete blocks (400x200x200) that will be required for a concrete wall 8m long and 4m high? (2marks)

b) What will be the total cost of concrete blocks for the concrete wall if the cost of each block is $1.95? (2marks)

Question 2

Calculate the amount of materials required to construct a rectangular concrete floor 900cm long, 450c m wide and 10cm thick. A nominal mix of 1:3: 5 is used. Assume there is 20% decrease in volume and 3% wastage during construction it is given that a 50kg bag of cement equals 37 liters by volume. (10marks)

Question 3

The following consecutive readings were taken during a differential levelling exercise at regular interval of 10 meter. (10marks)

2.850, 1.950, 1.255, 1.150, 0.825, 0.640, 1.250, 0.985, 0.560, 1.225

The reading was taken on a station with a RL of 100m and the instrument was shifted after the

5th reading.

Draw out the columns of a levelling book and calculate the RL of all the stations using **Rise and Fall method**.

Arithmetic check

> ➤ Calculate sum of$\sum$ Back sight, $\sum$fore sight, $\sum$rise and $\sum$fall.

> ➤ Calculate the Reduced level?

> ➤ Find the slope percentage %?

Question 4

The following consecutive readings were taken during a differential levelling exercise at regular interval of 10 meter. **(10marks)**

2.850, 1.950, 1.255, 1.150, 0.825, 0.640, 1.250, 0.985, 0.560, 1.225

The reading was taken on a station with a RL of 100m and the instrument was shifted after the

5ᵗʰ reading.

Draw out the columns of a levelling book and calculate the RL of all the stations using **(H I method).**

Arithmetic check

> Calculate sum of$\sum$ Back sight, $\sum$fore sight?

> Calculate sum, $\sum$Last RL $\sum$first RL.

> Find the slope percentage %?

The End