



COLLEGE OF AGRICULTURE, FISHERIES & FORESTRY
SCHOOL OF AGRICULTURAL SCIENCES
DEPARTMENT OF SOIL SCIENCE & AGRICULTURAL ENGINEERING
FINAL EXAMINATION
TRIMESTER 3, 2017
BACHELOR OF SCIENCES (AGRICULTURE)
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 answer on a fresh page and use both sides of the sheet.
3. Do not write your name on any answer sheet - only write your examination number.
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 Number of pages = 07
9. Total marks = 100

SECTION	DESCRIPTION	Marks
SECTION A Objective type questions	Part I – Multiple Choice Questions	20
	Part II – Fill the Blanks	10
	Part III – True or False	10
All question in this section are Compulsory		
SECTION B Descriptive type questions	Short Answer, Essay and Calculations	60
All question in this section are Compulsory		
TOTAL		100

SECTION A

All questions in this section are Compulsory

PART I

Multiple Choice Questions

(20marks)

- 1 The line of collimation method basically use
(A) Instrument height (B) Fore sights
(C) Back sights (D) Reduced levels
- 2 The smaller horizontal angle between the north direction and a survey line take in clockwise, is known?
(A) Declination (B) Whole circle Bearing
(C) Reduce Bearing (D) Dip
- 3 Contour interval is
(A) The vertical distance between two consecutive contours
(B) The horizontal distance between two consecutive contours
(C) The vertical distance between two points on same contour
(D) The horizontal distance between two points on same contour
- 4 There are two stations A and B. Which of the following statements is correct?
(A) The fore bearing of AB is AB (B) The back bearing of AB is BA
(C) The fore and back bearings of AB differ by 180° (D) All the above
5. In levelling operation
(A) When the instrument is being shifted, the staff must not be moved
(B) When the staff is being carried forward, the instrument must remain stationary
(C) Both (a) and (b)
(D) Neither (a) nor (b)
- 6 Chain surveying is well adopted for
(A) Small areas in open ground (B) Small areas with crowded details
(C) Large areas with simple details (D) Large areas with difficult details
7. What is the most level surface from following's surfaces?
(A) Playground (B) Surface of still water body
(C) Road surface (D) Home garden
- 8 Theodolite can be used to measure
(A) Horizontal Angle (B) Vertical Angle
(C) A & B (D) Neither A or B

9 What is unit of Work and Energy?

- (A) Joule (B) kilogram
(C) Ampere (D) meter

10 Photovoltaic cell converts

- (A) Sound energy into electrical energy (B) Electrical energy into mechanical energy
(C) Solar energy into electrical energy (D) Electrical energy into light energy

11 What is suitable drying temperature range for drying of fruits?

- (A) 90°C - 100°C (B) 70°C - 80°C
(C) 80°C - 90°C (D) 50°C - 60°C

12. Storage of fruits and vegetables, where the gas composition is changed from that of normal atmosphere and a precise control is maintained over the atmospheric composition during storage period is known as

- (A) Controlled Atmospheric (CA) storage (B) Modified Atmospheric (MA) storage
(C) Cold storage (D) Hypobaric storage

13. What is best storage temperature for tropical fruits?

- (A) 0°C - 4°C (B) 11°C - 15°C
(C) 5°C - 10°C (D) None of above

14. In pre-cooling, water is mostly removed by

- (A) Convection (B) Radiation
(C) Conduction (D) None of these

15 Case-hardening of seed kernel can be happened due to

- (A) Rapid drying (B) Continuous soaking
(C) Rapid steaming (D) Continuous drying

16 Earth contact area of the foundation should be larger because of

- (A) To make good contact with soil (B) Reduce the building pressure to earth
(C) To make attractive (D) A & B

17 Safe storage moisture level of grain crop in tropics is generally below the range of

- (A) 4 to 6% (B) 8 to 9 %
(C) 10 to 11% (D) 12 to 13%

18 Cyclone separator is used for separating the:

- (A) Fine particles (B) Medium particles
(C) Heavy particles (D) All are correct

19 What is the separation techniques use in cyclone separator?

- (A) Gravity separation (B) Centrifugal separation
(C) Size separation (D) Colour Separation

20 Primary cleaning of grains is done on the basis of:

- (A) Shape (B) Size
(C) Weight (D) Density

PART II

Fill in the Blanks

(10marks)

1. _____ is the science and art of determining and mapping of the relative positions of points on the earth's surface.
2. _____ is the measurement of sides of a triangle.
3. _____ it is the measurement and mapping of the physical features of the earth
4. _____ prevent the case hardening of grain seed during drying
5. The last reading taken from a dumpy level to a leveling staff before shifting the instrument is known as _____
6. _____ is used to prevent the passage of moisture from entering through the foundation or floor slab into the building.
7. A _____ is the ratio of map distance to the equivalent distance on the ground using the same units for both.
8. A _____ is an instrument that measures the bearing of a line
9. A _____ is a line on a map that joins points of equal height above datum.
10. _____ drying is traditional preservation technology of food.

PART III

True or False

(10 Marks)

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

1. Fore sight is the first reading taken from a compass
2. The curing period of concrete is 4 weeks.
3. Sorting and grading is not important post-harvest practice
4. In plane surveying the earth is treated as a flat surface over the survey area
5. The span of a house refers to its length
6. The sum or difference between the fore and back bearing is always 180 degrees.
7. Parboiling of paddy will improve rice storage time.
8. The part of the building below the plinth level is known as foundation
9. A check line and a tie line are the same measurement during chain survey
10. Traversing is the principle of compass survey.

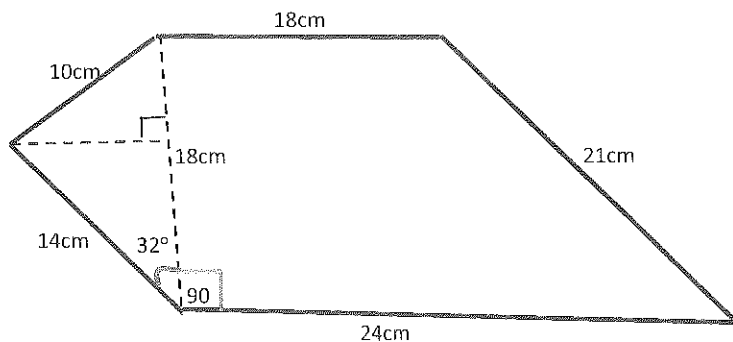
SECTION – B

Short Answer, Essay type and Calculations (3 questions)

(60marks)

Question 1.

1. Define the survey. **(2 Marks)**
2. Briefly explain chain survey method. **(2 Marks)**
3. The length of a line was measured with a 20m chain and it was recorded as 530m. Later it was found that the chain was 4cm too long. What is the true length of the line? **(3 marks)**
4. Following plot having a scale of 1:10000. Calculate the ground (land) area of plot in square meters and hectares. **(5 mark)**



5. The following perpendicular offsets in meters were taken from a chain line to a curved boundary at interval of 9m?
4.25, 5.83, 3.26, 6.45, 5.33, 8.87, 7.23, 9.85, 4.27, 4.87, 5.24
Apply trapezoidal rule and calculate the area between the chain line and the curved boundary? **(4 marks)**

$$\text{Area} = x \{ (y_1 + y_n)/2 + y_2 + y_3 + y_4 + \dots + y_{n-1} \}$$

6. Apply Simpsons Rule and calculate the same area between the chain line and the curved boundary and compare your answers? **(4 marks)**

$$\text{Area} = X/3 \{ (y_1 + y_n) + 4(y_2 + y_4 + y_6 + \dots + y_{n-1}) + 2(y_3 + y_5 + y_7 + \dots + y_{n-2}) \}$$

Question 2

1. Define the leveling (2 Marks)
2. The following consecutive reading was taken by leveling exercise. Fill in the table using Rise and Fall Method (4marks)

SN	BS	IS	FS	RISE	FALL	RL	DISTANCE
1	0.850					100	0
2	0.82		0.875				15m
3		0.930					18m
4		0.450					24m
5		0.960					28m
6	0.325		0.754				35m
7	0.730		0.651				38m
8			0.560				40m
				ΣRISE	ΣFALL		

3. Calculate the slope angle SN 1 and SN 8 (3 marks)
4. Explain advantage and disadvantage of concrete building structure in comparison to wood structure (2 Marks).
5. Calculate the amount of material required to construct a rectangular concrete floor 8.50m long, 4.8m wide and 12cm thick. A nominal mix of 1:3:5 is used. Assume there is 30% decrease in volume and 5% wastage 50kg of cement equal to 37 liters? (5 marks)
6. The following timber has to be ordered from a local timber supplier

Timber size	Length in meters	no of pieces
100x50mm	5m	44
100x100mm	3m	14
100x75mm	3m	08

Prepare a bill of Quantities and calculate the total cost of timber if the cost is \$800 per cubic meter? (4 marks)

Question 3

1. Explain what is renewable energy? (2 Marks)
2. Briefly explain 5 renewable energy sources available in Fiji (2 Marks)
3. Write down the steps of rice processing (make process flow chart) and explain each processing steps briefly (4 Marks)
4. Discuss the important of drying of grains (2 Marks)
5. If 200 kg of maize at 32 percent moisture content are dried to 14 percent moisture content, what is the weight of the dried maize? (4 Marks)
6. Silo (Just like large cylinder) is going to be designed for bulk storage of paddy. Height of the silo was planned for 3.5m height. Calculate the inside radius of the silo enough for storing 100MT of paddy. How many kg of maize can be stored in this silo?
(6 Marks)
(Assume Bulk Density of paddy & maize 565kgm^{-3} & 720kgm^{-3} respectively)

The End

