



COLLEGE OF AGRICULTURE, FISHERIES & FORESTRY
SCHOOL OF AGRICULTURAL SCIENCES
DEPARTMENT OF AGRICULTURAL ECONOMIC AND EXTENSION EDUCATION
FINAL EXAMINATION
TRIMESTER 3, 2017
TRADE DIPLOMA IN AGRICULTURE
AEG 402: Farm Surveying, Farm Structures and Post-Harvest Handling

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 number of pages = 9
8. Total marks = 100

| SECTION | DESCRIPTION | Marks |
|-----------|---|------------|
| SECTION A | Part I – Multiple Choice | 20 |
| | Part II – Fill in the Blanks | 10 |
| | Part III– True or False | 10 |
| | Part IV - Diagram | 10 |
| | All question in this section are Compulsory | |
| SECTION B | Short Answer All question in this section are Compulsory | 25 |
| SECTION C | Long Answer and Calculation All question in this section are Compulsory | 25 |
| | TOTAL | 100 |

SECTION A

PART 1

Multiple Choices

(20marks)

1. The preparation and execution of engineering works such as construction of roads, bridges and buildings
 - A) Cadastral Surveying
 - B) Mining Surveying
 - C) Plane Surveying
 - D) Engineering Surveying

2. The measurement error caused by wind, temperature, humidity, refraction, gravity, and magnetic declination
 - A) Natural error
 - B) Instrumental errors
 - C) Personal errors
 - D) Parallax errors

3. Indicates the relationship between a certain distance on the map and the corresponding distance on the ground
 - A) Scale
 - B) Plan
 - C) RF Scale
 - D) Bar Scale

4. The measurement of sides of a triangle whereas triangulation refers to the measurement of the angles of the triangle
 - A) Main stations
 - B) Subsidiary stations
 - C) Trilateration
 - D) Tie stations

5. When a sequence of connected lines extends along a general direction and doesn't return to the starting point,
 - A) Open Traverse
 - B) Close Traverse
 - C) Traverse
 - D) Triangulation

6. It is horizontal angle between the reference meridian and the survey line measured in clockwise or anticlockwise direction
 - A) Meridian
 - B) True Meridian
 - C) Bearing
 - D) Magnetic Meridian

7. The direction indicated by a freely suspended and balanced magnetic needle unaffected by local attractive forces
- A) Meridian
 - B) True Meridian
 - C) Bearing
 - D) Magnetic Meridian
8. The horizontal angle between the magnetic meridian and true meridian and true meridian
- A) Magnetic declination
 - B) Declination west
 - C) Declination east
 - D) Declination
9. The first reading from any set up of the instrument
- A) Back sight
 - B) Fore sight
 - C) Datum
 - D) Bench mark
10. The vertical distance of a point with respect to given datum, either positive or negative, is known as the elevation of that point
- A) Elevation
 - B) Bench mark
 - C) Datum
 - D) Intermediate sight
11. It is an optical instrument used to establish or verify points in the same horizontal plane. It is used in surveying and building with a vertical staff to measure height differences and to transfer, measure and set heights
- A) Levelling staff
 - B) Dumpy Level
 - C) Compass
 - D) Tripod stand
12. It is a composite building material made from the combination of aggregate (composite) and a binder such as cement.
- A) Concrete
 - B) Clay
 - C) Brick
 - D) Timber

13. In a framed structure, the sill which is nearest the ground or on the ground; used to distribute concentrated loads, horizontal structural member of a stud framed wall
- A) Top plate
 - B) Bottom plate
 - C) Stud
 - D) Corner Post
14. Structure that supports the weight of the upper structure and applied loads structure and applied loads. Designed to transmit building load to the supportive soils or rock
- A) Foundation
 - B) Roofing
 - C) Piles
 - D) Rocks
15. The instruments that measures vertical and horizontal angles
- A) Compass
 - B) Dumpy level
 - C) Measuring
 - D) Theodolite
16. The scientific study of the physiology of living plant tissues after they have denied further nutrition by picking
- A) Postharvest Physiology
 - B) Post harvest
 - C) Post-Harvest Operation
 - D) Postharvest treatment
17. Careless handling, such as dropping or throwing or walking on produce and packed containers during the process of grading, transport or marketing caused by ?
- A) Mechanical injury
 - B) Pest and Disease
 - C) Environmental Factor
 - D) Temperature
18. The handling is the stage of crop production immediately following harvest, including cooling, cleaning, sorting and packing
- A) Post harvest
 - B) Post harvest treatment
 - C) Quality assurance
 - D) Packaging

19. To prevent the passage of moisture from entering through the foundation or floor slab into the building
- A) Dump proof course
 - B) Concrete slab
 - C) Foundation
 - D) Tiles
20. It is major process of post-harvest handling where fruits and vegetable are cleaning and inspection is carry out before marketing.
- A) Harvesting
 - B) Grading and Sorting
 - C) Marketing
 - D) Physical injury

PART II

FILL IN THE BLANKS

(10marks)

1. A branch of surveying concerned with the measurements and mapping of physical Features of the earth is known as _____
2. _____ is magnetic material such as iron which affects the compass needle.
3. _____ is a type of survey that relies only on linear measurements
4. The first reading taken from a compass to a survey station is known as _____.
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 _____ indicates the relationship between a certain distance on the map and the corresponding distance on the ground.
8. A series of connected straight lines each joining two points is called _____.
9. _____ is the measurement of sides of a triangle whereas triangulation refers to the measurement of the angles of the triangle.
10. A branch of surveying in which the earth's curvature is taken into account when taking linear measurements are known _____

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

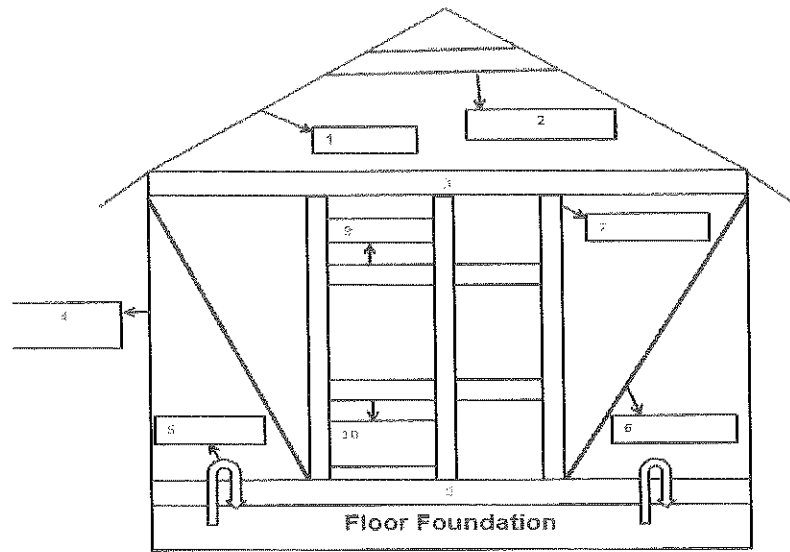
1. Postharvest losses reduce the quality of fruits and vegetables by 20- 30 per cent
2. An EDM is an instrument used for leveling.
3. Compass survey is ideal for an area having overhead power lines
4. $BB = FB \pm 180$ degrees.
5. In plane surveying the earth is treated as a flat surface over the survey area
6. A GPS assists in Navigation
7. In chain survey only linear measurements taken
8. Cadastral surveying is used for mapping property boundaries
9. Levelling is the science and art of determining and mapping of the relative positions of points on the earth's surface.
10. Geodetic surveying is the determination of the shape and size of the earth.

PART IV**DIAGRAMS****(10 marks)**

All questions in this section are Compulsory

1. Labeled diagram of a timber wall showing the following structural members with their respective dimensions:

Timber wall structure



SECTION B

Short answers

(25marks)

All questions in this section are Compulsory

1. Explain the term levelling? (1.5marks)
2. List two types of North Point? (1mark)
3. Define term Post harvest handling? (1.5marks)
4. List two causes of postharvest losses? (2marks)
5. Name two instruments used in leveling? (1marks)
6. Explain the principal of compass surveying?(2marks)
7. Explain the term geodetic surveying? (2marks)
8. List three types of agricultural Structures.(2marks)
9. List the uses of each of the following instruments? (3marks)
 - i. Compass
 - ii. Tripod stand
 - iii. Leveling staff
10. Define term surveying and state uses of surveying in agriculture? (2marks)
11. Name any three instruments/equipment that is used during chain survey? (2marks)
12. Explain the cause's mechanical injury in farm produce? (3marks)
13. What is farm structure? (1mark)

SECTION C

Long Answers and Calculation

(25marks)

All questions in this section are Compulsory

1. 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? **(2marks)**

2. A trapezoidal area on a map having a RF scale of 1:10000 measure 75mm ,120mm as top and base width respectively. Calculate the area in hectares if the perpendicular distance between the top and the base is 80mm? **(2marks)**

3. The following perpendicular offsets in meters were taken from a chain line to a curved boundary at interval of 12m? **(3 marks)** 4.25, 5.83, 3.26, 6.45, 5.33, 8.87, 7.23, 9.85, 4.27

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

Apply trapezoidal rule and calculate the area between the chain line and the curved boundary?

4. (A) Calculate the number of standard concrete blocks (400x200x200) required for a wall 20m long and 3 m high

(B) What would be the total cost if a concrete block costs \$1.85? **(2marks)**

5. From the local timber supplier 20 pieces of 100x 50mm timber each of which is 4.5 meters long were ordered. What is the total cost if timber costs \$1800 per cubic meter? **(3marks)**

6. Convert the following whole circle bearing into reduced bearing and reduced bearing into WCB **(3marks)**

| WCB | Reduced Bearing | Reduced Bearing | WCB |
|------------------|-----------------|--------------------|-----|
| 55 ⁰ | | S23E | |
| 184 ⁰ | | N28 ⁰ W | |
| 130 ⁰ | | S37 ⁰ W | |
| 215 ⁰ | | N55 ⁰ E | |
| 320 ⁰ | | N84 ⁰ W | |

7. Calculate the amount of material required to construct a rectangular concrete floor 800cm long, 530cm wide and 8cm 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? **(5marks)**

8. The following consecutive reading was taken doing a differential leveling exercise on the crop farm. Now fill in the table given below. Use **Rise and Fall Method (5marks)**

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

Arithmetic check

- A) Calculate sum of Σ Back sight, Σ fore sight, Σ rise and Σ fall.
- B) Calculate the Reduced level?

The End

