



COLLEGE OF AGRICULTURE, FISHERIES & FORESTRY
SCHOOL OF AGRICULTURE AND FORESTRY

DEPARTMENT OF SOIL SCIENCES AND BIO-SYSTEM ENGINEERING
FINAL EXAMINATION
SEMESTER 2, 2020

Trade Diploma In Agriculture (Year 1)
AEG 412: Farm 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 – 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

All questions in this section are Compulsory

PART 1

Multiple Choices

(20marks)

1. 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
2. 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
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 Trilateration measurement of sides of a triangle whereas _____ refers to the measurement of the angles of the triangle
 - A) Main stations
 - B) Subsidiary stations
 - C) Triangulation
 - 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. Compass surveying is not recommend for areas where _____ is suspected due to presence of magnetic substance like steel structures, iron, and electric cables conveying currents
- A) Meridian
 - B) Local Attraction
 - 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 last 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. This map will include _____, location of natural features, such as streams, gullies, and ditches and man-made features like bridges, culverts, roads, fences, etc. which are needful for detailed planning
- A. Contour lines
 - B. Mining Surveying
 - C. Bar Scale
 - D. Engineering Surveying
19. The measurement error caused by wind, temperature, humidity, refraction, gravity, and magnetic declination in the compass surveying.
- A) Natural error
 - B) Instrumental errors
 - C) Personal errors
 - D) Parallax errors
20. It is major process of post-harvest handling where fruits and vegetable are cleaning and inspection is carry out before exporting 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 50- 80 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 Geodetic surveying the earth is treated as a flat surface over the survey area
6. A GPS assists in Navigation
7. In chain survey only vertical distances measurements taken
8. Hydrographic 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. Plane surveying is the determination of the shape and size of the earth.

PART IV

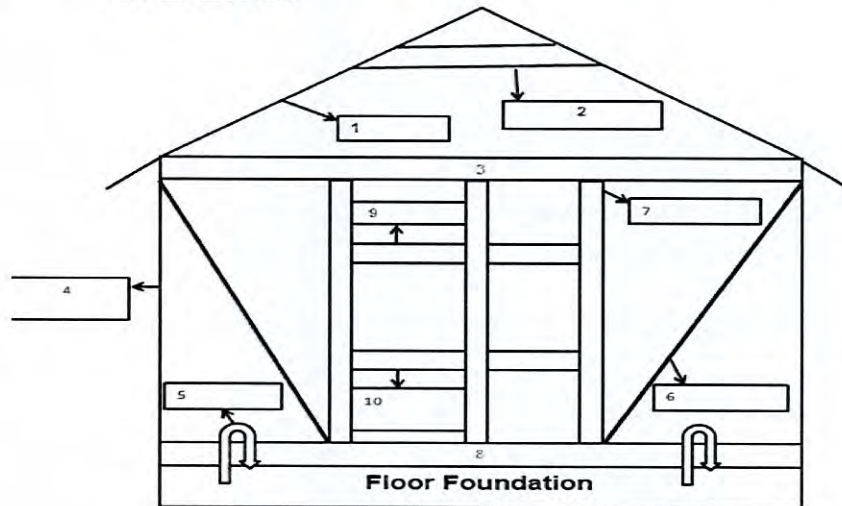
DIAGRAMS

(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 Surveying and state uses of surveying in agriculture? **(2.5marks)**
2. List two types of Scale? **(2mark)**
3. Define term Post harvest handling? **(1.5marks)**
4. Explain the application area of leveling? **(2marks)**
5. Name two instruments used in Compass surveying? **(1marks)**
6. Explain the principal of compass surveying? **(2marks)**
7. Explain the term engineering surveying and mining and mineral surveying? **(2marks)**
8. Differentiate the following terms. **(3marks)**
 - Gunter's chain and Engineers chain
 - Prismatic compass and Surveyor compass
9. List the uses of each of the following instruments? **(2marks)**
 - Leveling Staff
 - Theodolites
10. Explain the electricity uses in agriculture? **(2marks)**
11. Explain the cause's mechanical injury in farm produce? **(3marks)**
12. What is farm structure? **(2mark)**

SECTION C**Long Answers and Calculation****(25marks)****All questions in this section are Compulsory**

1. The length of a line was measured with a 30m chain and it was recorded as 600m. Later it was found that the chain was 8cm 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 80mm ,100mm as top and base width respectively. Calculate the area in hectares if the perpendicular distance between the top and the base is 60mm? **(2marks)**
3. The following perpendicular offsets in meters were taken from a chain line to a curved boundary at interval of 12m? **(2 marks)**

4.25, 5.83, 3.26, 6.45, 5.33, 8.87, 7.23, 9.85, 4.27

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 30m long and 4 m high

(B) What would be the total cost if a concrete block costs \$1.95? **(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? **(2marks)**

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

WCB	Reduced Bearing	Reduced Bearing	WCB
75°35'		S23 10'E	
150°40'		S47° 37'W	
320°25'		N84° 44'W	

7. Calculate the amount of material required to construct a rectangular concrete floor 8m long, 5m wide and 10cm thick. A nominal mix of 1:3:5 is used. Assume there is 25% decrease in volume and 5% wastage 50kg of cement equal to 37 liters? **(5marks)**

8. Find the moisture content (Mc %) on harvested crop on wet (W_{wb}) and dry bases (W_{db}). Given that the weight of water in the harvested crop was 20 kg and weight of harvested crop was 80 kg. (2 marks)

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	1.255					100	0
2		0.875					15m
3		1.115					18m
4		0.450					24m
5		0.960					28m
6		0.525					35m
7		0.830					38m
8			0.860				40m
	Σ BS		Σ FS	Σ RISE	Σ FALL		

Arithmetic check

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

The End