JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF SPATIAL PLANNING

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN HORTICULTURE AND BACHELOR OF SCIENCE IN SOIL SCIENCE

SEMESTER 2016/2017 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: ALS 3314

COURSE TITLE: PRINCIPLES OF SURVEYING

EXAM VENUE: **STREAM: SPATIAL PLANNING**

DATE: **EXAM SESSION:**

TIME: 2 HOURS

Instructions:

1. **Answer question 1 (compulsory) and ANY other 2 questions.**
2. **Candidates are advised not to write on the question paper.**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

Question One

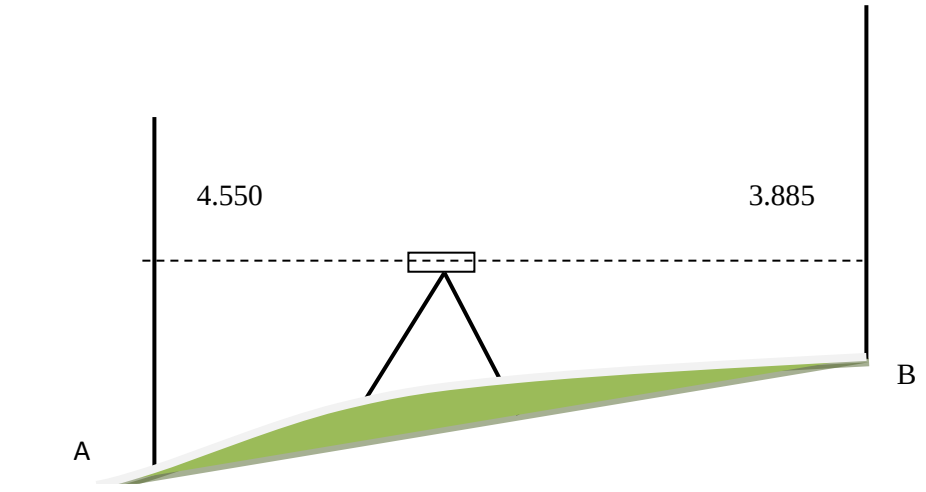
a) Describe the following concepts in relations to surveying.

i. Geomatics (2 marks)
ii. Geodetic surveying (2 marks)
iii. Horizontal angle (2 marks)
iv. Plane Tabling (2 marks)
v. Aerial photography (2 marks)

b) Shape of a flower farm comprises a rectangle measuring 250m by 150m, and a semi cycle whose diameter is 100 metres. By using sketch, determine the area in hectares. Give your answer in 2 decimal places (5 marks)

c) You are commissioned to measure perimeter of a farmland for anticipated irrigation project. Discuss different methods of distance measurements that you may deploy to deliver the assignment. (10 marks)

d) The diagram below is a levelling set up to determine the height of point B from point A, being an end point of a storm drain. Given that the reduced level at A is 2435.04m above mean sea level, while staff readings at A and B is 4.550 and 3.885 respectively. Determine height of point B. (5 marks)



Question Two

a) Write down the relationships between polar coordinates (r, θ) and rectangular coordinates (E, N). (4 marks)

b) The UTM coordinate as determined by GPS was recorded as X (61482 mE & 816118 mN) and Y (75533 mE & 908812 mN). Determine distance and bearing from X to Y. (8 marks)

c) List possible errors in ordinary leveling field practical. (8 marks)

Question Three

a) Convert 6.792 radians into degrees minutes and seconds. (4 marks)

b) You are carrying out surveying measurements for distance, angular, height and area for new horticulture project paddocking, drainage and structures layout. Explain the main principles in surveying measurements that you will strive to observe (10 marks)

c) Aerial photography is very application in Soil and Water Conservations. Discuss

(6 marks)

Question Four

a) What is tape and offset surveying (2 marks)

b) Explain how you will carry out measurement of a surveying line along a level ground, between point P and Q, which is approximately 230.05 metres with a 50 metres tape. (10 marks)

c) Offsets and ties are techniques in picking details during tape and offset surveying. Describe different ways of achieving offsets with respect to survey lines. (8 marks)

Question Five

a) Describe the following terminologies as used in leveling.

i. Level line (2 marks)
ii. Bench mark (2marks)
iii. Backsight (2 marks)

iv. Height of Collimation (2 marks)

b) The table below shows the level field notes for profile leveling (longitudinal section along a centerline of a water pipeline). Determine the reduced level using Rise and Fall Method. Apply all mathematical checks. (12 marks)

Take *reduced level at A as 1852 m above mean sea level*

B.S.	**I.S**	**F.S**	**Rise**	**Fall**	**Reduced Level**	**Distance**	**Remarks**
1.860					1852.000	0.00	A
	2.220					20.00	P1
0.845		3.590				40.00	P2
	1.170					60.00	P3
	2.370					80.00	P4
		2.880				100.00	B