JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF SPATIAL PLANNING

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF ARTS IN SPATIAL PLANNING AND BACHELOR OF SCIENCE IN WATER RESOURCE AND ENVIRONMENTAL MANAGEMENT

SEMESTER 2016/2017 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: PSP 3122

COURSE TITLE: 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) Differentiate the following concepts in relation to Surveying.

i. Surveying and Geomatics [2 Marks]
ii. Plane Surveying and Geodetic Surveying [2 Marks]
iii. Chain Surveying and Plane Tabling [2 Marks]
iv. Horizontal angle and Vertical angle [2 Marks]
v. Rectangular coordinate and polar coordinates [2 Marks]

b) An angle has been given as 195^0 37' 29". Convert into Radian [3 Marks]

c) An area of a parcel of land has been given as 5.865 acres. How many hectares are these? [3 Marks]

d) 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. By use of a sketch, determine height of point B using Rise and Fall method [4 marks]

e) Identify and briefly describe distance measurements methods on the surface of the earth. [10 Marks]

Question Two

a) Describe basic principles in surveying measurements. [6 Marks]

b) The surveyor runs a closed traverse between control stations A and B, through P1, P2, P3 and P4. The whole circle bearing (WCB) and distances were reduced, and represented as follows:

	E(m)	N(m)
A	3743.25	5698.12
B	3835.76	5414.55

Line	WCB	Distance (m)
A-P1	151 54 20	56.43
P1-P2	158 30 25	39.48
P2-P3	161 02 10	95.36
P3-P4	168 15 00	54.00
P4-B	170 03 50	54.89

Determine the coordinates of points P1, P2, P3 and P4 [14 Marks]

Question Three

a) You are tasked with measuring and producing map of JOOUST main campus using Tape and Offset surveying. Identify surveying tasks that you will undertake to successfully execute or deliver the work in chronological order. [10 Marks]

b) The following data was obtain in a tacheometric survey during trigonometric heighting exercise, to determine height of point P from instrument station A. Calculate horizontal distance (H), vertical distance (V) and Reduced Level (RL) and fill them in the blank spaces. [10 Marks]

Hi	**Vertical Angle**	**Stadia readings**			**H**	**V**	**RL**	**Staff Stn**
		Upper	Middle	Lower				
@A								
1.45	$+04^0$ 16' 30"	3.94	3.86	3.78				P

Take height at A to be 2250m

Question Four

a) The below table shows the level field notes for profile leveling (longitudinal section along a centerline of a road). Determine the reduced level using Rise and Fall Method [10 Marks].

Reduced level at A is 1500m above mean sea level

B.S.	**I.S**	**F.S**	**Reduced Level**	**Distance**	**Remarks**
0.345			1500.00	0.00	A
	0.670			20.00	P1
	1.870			40.00	P2
0.680		2.380		60.00	P3
	1.320			80.00	P4
		0.850		100.00	B

b) Carrying out all mathematical checks in rise and fall method in a) above [3 Marks]

c) Identify possible ways of eliminating errors during leveling field survey. [7 Marks]

Question Five

a) With the aid of a sketch, describe clearly how Global Positing System (GPS) determines positions on the earth's surface [8 Marks]

b) The UTM coordination as determined by GPS was recorded as X (40982 mE & 815518 mN) and Y (65033 mE & 908312 mN). Determine distance and bearing from X to Y.

[6 Marks]

c) Why would you prefer GPS over other surveying distance measurement methods

[6 Marks]