MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR

THIRD YEAR FIRST SEMESTER

SCHOOL OF TOURISM AND NATURAL RESOURCE MANAGEMENT

BACHELOR OF SCIENCE IN FORESTRY

COURSE CODE: FOR 310

COURSE TITLE: FOREST INVENTORY

DATE: 26TH APRIL, 2018 **TIME: 11:00AM-13:00PM**

INSTRUCTIONS TO CANDIDATES

Answer **ALL** questions in section **A. Answer question 6** and any other **TWO** in section **B.**

This paper consists of 4 printed pages. Please turn over

Section A: Answer ALL questions (25 Marks)

Question 1

Explain five reasons for conducting a forest inventory **(5 Marks)**

Question 2

Explain why an inventory involving complete enumeration of 5000 ha of forest is likely to be much less acceptable to a forest manager than one based on a 5% sample of the same forest. **(5 Marks)**

Question 3

i) Outline the importance of management plan inventories **(3 Marks)**
ii) Discuss the objectives of PSPs establishment for management of a forest estate **(2 Marks)**

Question 4

Explain how you would determine the following stand variables from a sample of 15 trees taken from a plot area of 0.05ha. Show your working clearly. **(5 Marks)**

a) Stocking, N

b) Basal area, G

c) Heights for three trees with dbh and no height measurements from this data

d) Mean top diameter (MTD)

e) Mean top height (MTH)

Question 5

Discuss the advantages of aerial photography over ground-based observations **(5 marks)**

Section B: Answer question SIX and any other TWO questions (45 Marks)

Question 6 (Compulsory)

i) Discuss the significance of the following terms as used during inventory sampling **(9 Marks)**

a) Accuracy
b) Bias
c) Precision
d) Error
e) Parameter
f) Population
g) Variable
h) Variate
i) Statistic

ii) A timber cruise was conducted on 852 ha forest. From aerial photographs, the forest was divided into: *Pinus patula*- 460ha, *Eucalyptus saligna*- 225 ha, *Eucalyptus camandulensis*- 113ha, and Indigenous forest- 54ha. Ten 0.5 ha plots were then selected at random and in each, total standing volumes on the plots was computed as in the Table below:

	Pinus patula	*Eucalyptus saligna*	*Eucalyptus camandulensis*	Indigenous forest
1	166.5	512.5	51.5	13.0
2	52.5	80.0	36.0	0.0
3	7.5	435.0	92.0	16.0
4	231.0	385.0	7.5	27.0
5	413.5	387.5	36.0	0.0
6	150.0	212.5	62.0	34.5
7	212.5	436.0	83.0	11.0
8	83.5	462.0	17.0	8.5
9	161.0	325.0	44.0	4.0
10	190.0	317.5	53.0	27.5

a) Compute the average volume in m^3/ha for each of the different forest types **(3 Marks)**

b) Estimate the average volume of the forest in m^3/ha **(3 Marks)**

Question 7

i) Outline the standard procedure for conducting a stratified random sampling **(10 Marks)**

ii) State the advantages and disadvantages of cluster sampling **(5 Marks)**

Question 8

i) Briefly describe the basic procedure to be followed when planning for a forest inventory **(8 Marks)**

ii) Outline the basic considerations when planning for inventory crews **(7 Marks)**

Question 9

i) Discuss the application of remote sensing in the management of forestry **(7 Marks)**

ii) State and explain the basic elements of aerial photo interpretation **(8 Marks)**
