

**MAASAI MARA UNIVERSITY**

**REGULAR UNIVERSITY EXAMINATIONS 2016/2017 ACADEMIC YEAR**

**FOURTH YEAR FIRST SEMESTER**

**SCHOOL OF TOURISM AND NATURAL RESOURCE MANAGEMENT**

**BACHELOR OF SCIENCE IN WILDLIFE MANAGEMENT**

**COURSE CODE: FOR 411**

**COURSE TITLE: FOREST HARVESTING**

**DATE: 2ND FEBRUARY, 2017 TIME: 11:00AM-1:00PM**

**INSTRUCTIONS TO CANDIDATES**

Answer **ALL** questions in section **A** and any other **THREE** in section **B.**

**SECTION A: Answer ALL questions in this section.**

1. Define the following terms
2. Setting
3. ‘In the bight’
4. Log making
5. Stanchion  **(2 marks)**
6. Provide a definition for the term ‘felling’, and state the main considerations when felling **(3 marks)**

# The following four factors affect the efficiency of ground-based harvesting. For each factor, briefly describe how a change in that factor will affect productivity.

1. Extraction distance
2. Tree size
3. Volume per hectare
4. Type of harvest **(4 marks)**
5. Identify the three distinct levels of harvesting planning, and provide a time frame for each. **(3 marks)**
6. With the aid of a diagram, show the typical cuts for a chainsaw in motor-manual felling.  **(3 marks)**
7. The relationship between productivity and piece size takes the general form;

Productivity = c (Piece size) 0.6 where c is a coefficient.

Using this relationship, if a harvest system is producing 25t/PMH at an average piece size of 1.6m3, what would you expect at 2.3m3?    **(3 marks)**

1. Identify four objectives of forest road location    **(2 marks)**
2. Under what circumstances would helicopter logging be preferred to other systems **(3 marks)**
3. Identify all the forest harvesting steps in sequence from start to finish     **(2 marks)**

**Section B: Answer ANY THREE Questions from this section**

Complete the following machine rate calculation form **(10 Marks)**

**Assumptions**

P = Purchase Price ($) = 300,000 F = Fuel and Lube ($/PMH) = $22

S = Salvage Value ($) = 45,000 T= Tires & Tracks ($/PMH) =$18

L = Life in years = 8 R = Repair & Mainte (% of DPR) = 110%

H = SMH/year = 2,200 LR = Labor rate ($/SMH) = 21

I = Inter, taxes & Insur = 12% LF = Labor fringe (% of LR) = 45

U = Utilization (%) = 70

A = Average Fixed Investment = ((P-S) x (L+I)/(2 x l) + S =\_\_\_\_\_\_\_\_\_\_\_\_\_

**Fixed Costs**

DPR = Depreciation = (P-S)/(LxH) =\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ITI = Int, Taxes and Insur. = (1 x A)/H = \_\_\_\_\_\_\_\_\_\_\_\_

**Total Fixed Cost ($/SMH**)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Variable Costs**

F = Fuel and Lube ($/PMH) =

T = Tyres and tracks ($/PMH) =

RM = Repair and Maintenance = (DPR x R) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Total Variable Cost ($/PMH) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_( x U)

**Total Variable Cost ($/SMH)** = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Labor Costs**

LR = Labor Cost =

LFR = Labor Fringe Cost = LR x LF =

**Total Labor Cost ($/SMH**) =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Total Machine rate ($/SMH)**=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(ii) Sate the factors that affect the choice of logging equipment **(7 marks)**

1. i) State and briefly describe five factors that affect forest harvest system selection **(5 marks)**

ii) List and explain five rules that govern forest/timber harvesting operations in Kenya **(5 marks)**

iii) State and briefly describe the importance of forest harvest planning    **(5 marks)**

1. (i) State any four characteristics of a good landing **(4 marks)**

ii) Apart from “Type of machinery” state the other eight factors that determine the overall size of a landing **(6 marks)**

iii) State six considerations taken onto account when locating forest roads **(5 Marks)**

1. Explain how each of the following factors affect logging productivity     **(15 marks)**

(i) Human factors

(ii) Mechanical and operational factors

(iii) Environmental factors

**END OF PAPER**