



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: WST 300
COURSE TITLE: WOOD PROPERTIES**

DATE: 25TH APRIL, 2018

TIME: 1100 – 1300HRS

INSTRUCTIONS TO CANDIDATES

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

This paper consists of 2 printed pages. Please turn over.

SECTION A (Answer all questions-25 Marks)

Question 1

- a) Explain the implication of different silvicultural activities practiced by foresters on wood properties and quality. **(5 Marks)**
- b) Explain the following in relation to wood failures
- i) Creep and relaxation
 - ii) Rate of loading
 - iii) Fatigue
- (2 Marks) each = (6 Marks)**

Question 2

- a) Draw the cell wall organization structure and indicate building components and the chemical distribution found in each layer **(5 Marks)**
- b) Explain the importance of knowing the properties of wood species being used for commercial purposes/in the market **(4 Marks)**
- c) Discuss the microfibril angle (MFA) of the wood cell wall and explain the main determinants of the mechanical properties of wood. **(5 Marks)**

SECTION B (Answer any three 45-Marks)

Question 3

- (a) Identify the physical properties of earlywood and latewood wood cells using illustrations where possible **(6 Marks)**
- (b) In reference to wood-water relationships explain the following terms:
- (i) Free Water
 - (ii) Bound water
 - (iii) Fibre saturation point
- (Each 3Marks=9Marks)**

Question 4

- a) Transport costs form a major part of the price of timber delivered at timber yards. If a merchant seeks quick advice from you concerning the savings from weight by allowing the moisture content in his 4000 kg load of timber to drop from 30% to 15%, what is the best estimate of the weight of the same load with this low M.C? State any key assumption(s) **(4 Marks)**
- b) Discuss giving relevant examples why wood parenchyma cells are very useful in identifying various hardwood species. **(3 Marks)**
- c) Briefly discuss the electrical properties of wood **(3 Marks)**

Question 5

- a) Discuss any three different kinds of knots and their effect on wood strength. Use diagrams where appropriate **(5 Marks)**
- b) Discuss wood as a building material as compared with other materials **(4 Marks)**
- c) Explain decomposition of wood by Chemical solutions and effects on properties **(3 Marks)**
- d) Explain the influence of wood anisotropy on the dimensional stability of wood **(3 Marks)**

Question 6

- a) Explain the reason for the high strength of wood in the longitudinal direction of the tree as compared to the transverse direction in relation to the cellulosic bonds. Draw and name the basic building unit of cellulose. **(4 Marks)**
- b) Discuss the major categories of softwood lumber grades **(6 Marks)**
- c) Explain why hardwoods are generally preferred than softwood for chemical treatment and for transmission poles **(5 Marks)**

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