

Uva Wellassa University
B.Sc. in Export Agriculture
Bachelor of Animal Science



**Uva Wellassa
University**

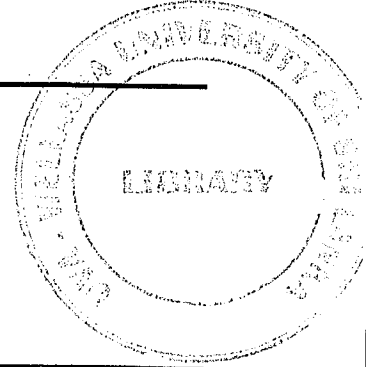
End Semester Examination December/January 2009/10
Year II Semester I

Agricultural Farm Mechanization AAS 202-2

Instructions

Answer all questions

No. of questions : Four (04)
No. of pages : Three (03)
Total marks allocated : 40/100
Time : Two hours (2hrs)



1.
 - a.
 - i. What is an internal combustion engine?
 - ii. How does an internal combustion engine function?
 - b. Explain the following terms in relation to internal combustion engines
 - i. Indicated Power
 - ii. Stroke bore ratio
 - iii. Piston displacement
 - iv. Mechanical efficiency
 - v. Compression ratio
 - c. A four cylinder four stroke engine having cylinder bore 7.5 cm and stroke length 10 cm develops 15KW at 1650 rev/min. Assuming a mechanical efficiency of 85%, find indicated power and mean effective pressure.
2.
 - a. Discuss the principles of the following;
 - i. Air cooling
 - ii. Governor
 - iii. Diesel engine
 - iv. Battery ignition
 - b.
 - i. List functions of a carburetor
 - ii. Briefly explain the components of a carburetor

- c.
 - i. What is meant by power transmission?
 - ii. List the methods of power transmission.
- d. If a driven pulley is made to rotate at 350 rev/min by a driving pulley of 0.3 meter diameter, running at 1400 rev/min, determine;
 - i. Diameter of the driven pulley
 - ii. Length of the open belt, when the pulleys are 2 meters apart
 - iii. Length of the cross belt when the pulleys are 2 meter apart

3.

- a.
 - i. Discuss how tillage practices help to improve the soil physical properties
 - ii. By using a flow chart, Illustrate a detail classification of tillage implements
 - iii. Briefly explain main components and their functions of a mould board plough
- b. Briefly explain the following Terms related to field performances of machinery
 - i. Theoretical Time (TT) & Effective Operating Time (ET)
 - ii. Field Efficiency (FE)
 - iii. Factors affecting field efficiency
- c. Total draft of a five bottom, 40 cm mould board plough when ploughing 17.0 cm deep at 6 km/hr speed is 1700 kg. Field efficiency is 75%. Calculate
 - i. Unit draft in KNm^{-2}
 - ii. Actual power requirement in KW
 - iii. Area covered by the plough in ha/hr

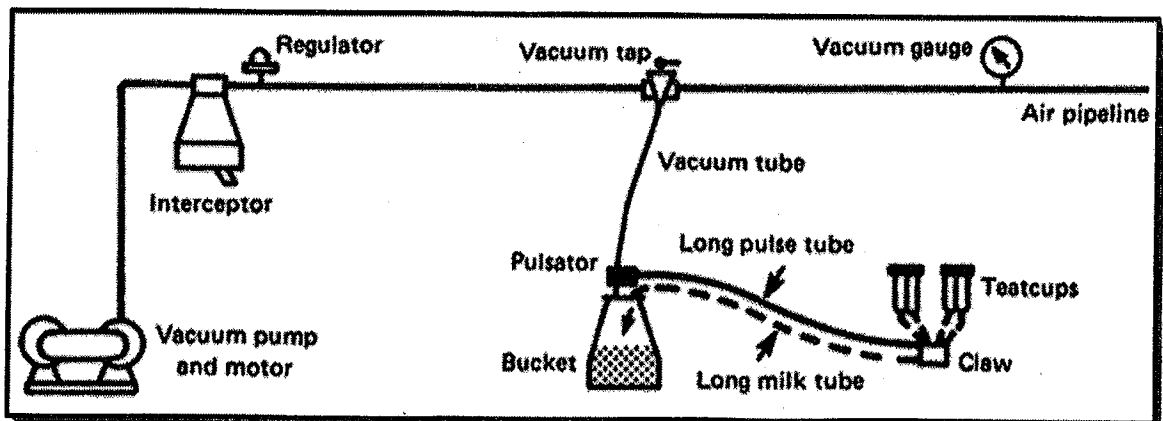
4.

a.

- i. What is the importance of use of heat in dairy processing plant?
- ii. How do Co-current and Counter-current heat transfer behave in a dairy plant?
- iii. Why is the cream separation unit operation is important in milk powder production
- iv. What is the flotation velocity of a fat globule which has a diameter of $4\mu\text{m}$? (Density of fat = $980\text{kg}^{\text{m}^{-3}}$, Density of milk = $1028\text{kg}^{\text{m}^{-3}}$, $g = 9.81\text{m}^{\text{s}^{-2}}$, Viscosity = $1.42 \times 10^{-3}\text{kg/ m.sec}$)
- v. What is the rate of separation if the diameter of the fat globule were double in size?

b.

- i. Name the **three (03) principles of milk extraction** based on which mechanical milking was developed.



- ii. Identify the **type of milking machine** given in the above diagram.
- iii. Mention the **specific function** of each of the following parts.

- A. Vacuum pump
- B. Vacuum regulator
- C. Vacuum gauge
- D. Interceptor
- E. Pulsator

- c. List down the **six (06) main components of an automatic milking system (AMS)**.