



The Open University of Sri Lanka
 Faculty of Engineering Technology
 Industrial Studies in Agriculture and Technology
 Final Examination - 2016

AEX5243/AEI5243/AEX5230 - Farm Power and Machinery

Date : 15-11-2016
 Time : 9:30-12:30 hours
 Duration : 03 hours

SECTION II: 2hours

Answer any four (04) of the questions.

1.
 - a. Define the terms, using diagrams where appropriate (2.5 marks each)
 - i. Engine
 - ii. Swept volume
 - iii. Compression ratio
 - iv. Engine capacity
 - b. Discuss the difference between (5 marks each)
 - i. Two stroke and four stroke internal combustion engines
 - ii. Spark Ignition engines and Compression Ignition engines
 - c. Briefly discuss the special features of an Agricultural Tractor. (5 marks)
2. Write short notes on the following (5 marks each).
 - a. Cooling system and lubrication system of an engine
 - b. Mould board and disc plough
 - c. Direct and indirect sun driers
 - d. Traction and Ballasting
 - e. Engine tune-up
3.
 - a. Calibration of a sprayer is crucial for efficient application of agrochemicals at the correct dosage. Critically discuss. (5 marks).
 - b. Suppose a knapsack sprayer nozzle delivers 0.20 gal/minute at 25 psi pressure.
 - i. If the walking speed of a farmer is 200 ft/minute and the spray width is 2 feet, calculate the area that could be covered per minute (consider 1acre = 43560 sqft). (5 marks)
 - ii. Calculate the gallons of spray applied per acre. (5 marks)
 - iii. If the capacity of the sprayer is 15, litres calculate the number of tanks needed for one acre of land. (5 marks)
 - iv. If the recommended chemical application is 10 oz Roundup per acre what is the amount of chemical should be added per each tank? (5 marks)
4. Write notes on the following in relation to agriculture (5 marks each).
 - a. Animal power
 - b. Wind power
 - c. Solar energy
 - d. Biomass energy
 - e. Hydropower
5.
 - a. What is tillage, primary tillage and secondary tillage? (10 marks)
 - b. What is the best time for tillage and how do you decide on it? (5 marks)
 - c. What are the advantages of tillage? (5 marks)
 - d. What are the disadvantages of tillage? (5 marks)

6. Mechanization in rice production is very important to increase the productivity of rice in Sri Lanka.
 - a. Describe the terms “production” and “productivity” with examples. (8 marks)
 - b. Discuss how mechanization could increase the productivity of crops. (7 marks)
 - c. Discuss the potential uses of combine harvesters and constraints of using them in the Sri Lankan context. (10 marks)