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The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Agricultural & Plantation Engineering



00108

Study Programme	: Bachelor of Industrial studies Honours in Agriculture
Name of the Examination	: Final Examination
Course Code and Title	: AGI5543/AEX5243/AEI5243/AEX5230 Farm Power and Machinery
Academic Year	: 2018/19
Date	: 14 th January 2019
Time	: 0930-1230hrs
Duration	: 3 hours

SECTION II: Answer any four (04) of the questions. You may spend 2hours

1.
 - a. Define the following terms, using appropriate diagrams (2.5 marks each)
 - i. Internal combustion engine
 - ii. TDC, BDC and 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)

Note: Use the knowledge gained through practical classes and field visits

2.
 - (a) Differentiate between agricultural production and productivity (6 marks).
 - (b) What are the factors that influence the land productivity? (6 marks).
 - (c) How mechanization can help to improve the land productivity? (7 marks).
 - (d) What are the constraints for mechanization in Sri Lanka? (6 marks).
3.

Write short notes on the following (5 marks each).

 - (a) Lubrication system of an engine.
 - (b) Importance of keeping records of farm machinery.
 - (c) Direct and indirect sun driers.
 - (d) Tractive efficiency.
 - (e) Ballasting.

- 4.
- (a) Calibration of a sprayer is crucial for efficient application of agrochemicals at the correct dosage. Critically discuss (15 marks).
 - (b) Suppose a knapsack sprayer has two nozzles with 1.5 feet spraying width and a half foot overlapping and each nozzle delivers 0.25 gal/minute at 25 psi pressure.
 - (i) If a walking speed of a farmer is 200 ft/minute calculate the area that could be covered per minute. (Consider 1ac = 43560 sqft). (2 marks)
 - (ii) What is the time needed to spray one acre? (3 marks)
 - (iii) Calculate the gallons of spray applied per acre. (3 marks)
 - (iv) If the recommended chemical application is 10 oz Roundup per acre what is the amount of chemical needed per gallon of water? (2 marks)

5. Write notes on the following in relation to agricultural production. You should indicate the advantages and disadvantages of each method (5 marks each).

- (a) Animal power
- (b) Wind power
- (c) Solar power
- (d) Hydropower
- (e) Tidal power

6.

- (a) What do you mean by biomass energy? (5 marks)
- (b) What are the advantages of producing biomass energy? (5 marks)
- (c) What are the most common biomass materials that could be found in a premises with a considerable vegetation like the Colombo Regional Centre of the OUSL? (3 marks)
- (d) How would you utilize these types of waste in producing energy while keeping the premises clean? Your answer should also include the constraints and the advantages of the proposed method. (12 marks)

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