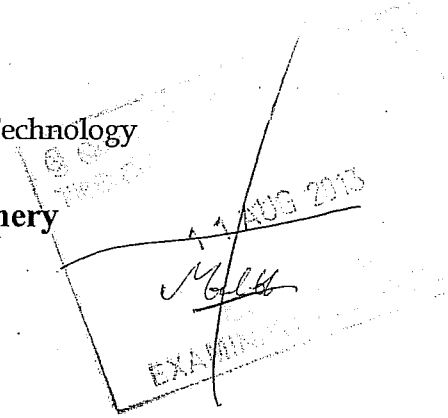


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The Open University of Sri Lanka
Faculty of Engineering Technology
Industrial Studies in Agriculture and Technology
Final Examination - 2013
AEI 5243 Farm Power and Machinery

Date : 11-08-2013
Time : 09.30-12.30 hours
Duration : 03 hours



SECTION II: 2hours

Answer any four (04) of the questions.

1. Differentiate between two-stroke and four-stroke engines. Your answer should be supported with diagrams and the advantages and disadvantages of each type should be highlighted. (25 marks)
2. Land productivity can be improved through mechanization. Critically discuss giving emphasis to land size and type, soil type and availability of machinery. (25 marks)
3. Write short notes on the following. (5 marks each)
 - a. Rotary engine
 - b. Knapsack sprayer
 - c. Direct and indirect sun driers
 - d. Carburettor
 - e. Fuel injector pump
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 nozzle delivers **0.24 gal/minute** at **25 psi** pressure.
 - (i) If a walking speed of a farmer is **220 ft/minute** and the spray width is **2.5 feet**, calculate the area that could be covered per minute (consider $1 \text{ ac} = 43,560 \text{ square ft}$). (5 marks)
 - (ii) Calculate the volume of spray applied per acre. (5 marks)
 - (iii) If the recommended chemical application is **16 oz**, Roundup per acre what is the amount of chemical needed per gallon of water? (5marks)
5. (a) Briefly discuss the special features of 'Agricultural tractor' (15 marks).
(b) List down the advantages of having
 - (i) a cooling system and (7.5 marks)
 - (ii) a lubrication system in a tractor engine (7.5 marks)
6. (a) Solar energy is a potential energy source for agriculture. Discuss (15marks)
(b) Is wind energy a potential energy source for agriculture in Sri Lanka? Justify your answer (15 marks).