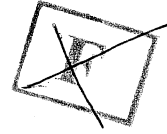The Open University of Sri Lanka
Faculty of Engineering Technology
Industrial Studies Programme of Study
Final Examination - 2014
AEI5243 Farm Power and Machinery

Date   : 15-08-2014
Time   : 13:30-16:45 hours
Duration   : 03 hours

SECTION II: 2hours
Answer **any four (04)** questions.

1. Discuss the function of an engine of a four wheel tractor with reference to the supportive structures. (25 marks)

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 farm mechanization in Sri Lanka ? (6 marks).

3. Write short note on the following (5 marks each).
   a. Mould board plough
   b. Disc plough
   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 nozzle deliver 0.25 gal/min at 25 psi pressure.
       (i) If a walking speed of a farmer is 200 ft/min and the spray width is 2.5 ft, calculate the area that could be covered per minute. (consider 1 ac = 43560 ft^2). (5 marks)
       (ii) Calculate the gallons of spray applied per acre. (5 marks)
       (iii) If the recommended chemical application is 10 oz Roundup per acre what is the amount of chemical needed per gallon of water? (5marks)

5. Write notes on the following. You should indicate the advantages and disadvantages of each method.
   (a) Animal power (5 marks)
   (b) Wind power (5 marks)
   (c) Solar power (5 marks)
   (d) Hydropower (5 marks)
   (e) Tidal power (5 marks)

6. You have been asked to keep the university premises clean without biodegradable debris pilling here and there within the premises. 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.