

Study Programme	: Bachelor of Industrial Studies Honours in Agriculture
Name of the Examination	: Final Examination
Course Code and Title	: AGI5364/AGX5543 Farm Power and Machinery
Academic Year	: 2020/21
Date	: 24 th February 2022
Time	: 14.00-17.00hrs
Duration	: 3 hours

SECTION II

Answer **any four (04)** Questions

Answer for each question should commence from a new page.

You may spend **two (2) hours**

1. Compare the following (*5 marks each*)
 - i. Manual harvesting vs mechanical harvesting
 - ii. Air cooling vs water-cooling systems of an engine
 - iii. Spark ignition vs compression ignition
 - iv. Primary tillage vs Secondary tillage
 - v. Two stroke engines vs four stroke engines
2. "Labour is becoming scarce in agriculture sector. Therefore, only solution for the problem is the mechanization of agricultural production process". Critically discuss with examples for both supportive and contradictory arguments. (*25 marks*)
3. Write short notes on the following (*5 marks each*).
 - i. Precision agriculture.
 - ii. Smart agriculture.
 - iii. Direct and indirect sun driers.
 - iv. Solar hybrid drier.
 - v. Tractive efficiency.
4. Write notes on the following in relation to agricultural production. You should indicate the advantages and disadvantages of each method (*5 marks each*).
 - i. Non-renewable energy
 - ii. Wind power
 - iii. Solar power
 - iv. Hydropower
 - v. Biomass energy

- 5.
- i. Suppose as an agricultural specialist you were asked to calibrate a Knapsack sprayer. Describe the stepwise procedure of calibration process. *(10 marks)*.
 - ii. Suppose a Knapsack sprayer has three nozzles with 2 feet spraying width and a half foot overlapping and each nozzle delivers 0.20 gal/minute at 25 psi pressure.
 - a. If the walking speed of a farmer is 200 ft/min, calculate the area that could be covered per minute. (Consider 1ac = 43560 sqft). *(5 marks)*
 - b. What is the time needed to spray one acre? *(3 marks)*
 - c. Calculate the gallons of agrochemical applied per acre. *(4 marks)*
 - d. If the recommended chemical application is 10oz Glyphosate per acre what is the amount of chemical needed per gallon of water? *(3 marks)*
- 6.
- i. Briefly discuss the special features of a two-wheel tractor in relation to agricultural production process. *(13 marks)*
 - ii. Briefly discuss the importance of animal power in agricultural production in the local context. *(12 marks)*