TKP3501
Agricultural Mechanization
Assignment 1

Question #1: - 5 marks
A combine harvester was deployed in order to help with the harvesting operation in rice production. A combine harvester for rice is having 400 cm cutter bar is operated at an average speed of 10 km/hr.

I. Calculates the theoretical field capacity of the combine? If we assumed the field efficiency of the combine is 80 percent, what is the effective field efficiency? (1 mark)

II. If 10% time is lost in turning, loading and unloading, calculate the harvested area in 5 hours, and the farm machinery index (FMI). (1 mark)

III. What can be expected when the speed is reduced by half from the initial speed? (1.5 mark)

IV. Briefly explain, how you can improve the actual field efficiency? (1 mark)

V. List down three factors contributed to the low efficiency during such operation. (1 mark)

VI. If we assume the field is perfectly square, calculate how many paths of the combine made to harvest the crop? Please give a brief explanation. (Tips: consider the area and the width of the combine). (1 mark)

Question #2: Refer to the excel data - 5 marks
A data from yield monitoring was used to log the information about the machine performance during the harvesting operation. The time for each of the operation was automatically recorded using the GPS data set. Therefore, from the data provided, the operator will be able to know the machine efficiency and the field machine index for the purpose of improving the farm machinery management. Using the data provided in the excel sheet;

I. Calculate the simple statistic of the parameters in the table. (1 mark)

II. What is the average between times in actual vs theoretical operation time and the average of the FMI for this machine? (1 mark)

III. Plot the graph between the total turning time vs FMI for this machine. In the graph, state the formula of the best fit of regression line and (1 mark)

IV. From the equation, what is the FMI index at turning time of 0.05, 0.2 and 0.8 sec. Discuss your finding. **Note: Print out the result table in case of hard copy submission.** (1 mark)