

**NATIONAL UNIVERSITY OF LESOTHO**

**FACULTY OF AGRICULTURE**

**DEPARTMENT OF CROP SCIENCE**

**AGRICULTURAL MECHANIZATION & MACHINERY MANAGEMENT- CPS 2504**

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**June 2023**

**MARKS: 100**

**TIME: 3 HOURS**

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**INSTRUCTIONS :**      Answer ALL five (5) questions.

### **QUESTION 1**

- a). i). Give four functions of a transmission system (4)
- ii). Engine capacity (2)
- iv). Sweft volume (2)
- v). Bottom Dead Centre (BDC) (2)
- b). i). Discuss the difference between internal combustion engines and external combustion engines: (5)
- ii). Explain what renewable sources of power are in agriculture and give their advantages and disadvantages; (5)

### **QUESTION 2**

- a). Explain how internal combustion engines operate when using two different types of fuel: petrol and diesel, clearly illustrating the difference between the two. (10)
- b). Name five components of a tractor electrical system and their functions. (10)

### **QUESTION 3**

Discuss the procedure for calibrating a wheat drill to give 75 kgs. per hectare, given the following:

- i). Drive wheel radius = 25 cm
- ii). Effective width of planter = 1.5 m

(20)

#### **QUESTION 4**

a). A 6-metres width of cut combine harvester is travelling at 2 m/s. In one minute 70 kg of grain is collected in the grain tank and 90 kgs. of material are discharged at the rear of the machine. Determine the following:

- i). Machine capacity;
- ii). Material capacity; and
- iii). Throughput capacity.

**(10)**

b). Discuss the following components of economic performance of farm power and machinery:

- i). Machine performance;
- ii). Power performance;
- iii). Operator performance.

**(10)**

#### **QUESTION 5**

i). Name five components of a boom sprayer and their functions.

**(10)**

ii). Explain the procedure for calibration of a broom sprayer

**(10)**