BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

MFS 512

Department of Agricultural Economics, Education and Extension

MSc in Food Security and Sustainable Agriculture Part I Examination

Sustainable Crop Production

3 HOURS (100 Marks)

INSTRUCTIONS TO CANDIDATES

Answer question **ONE** from **SECTION A** and any **TWO** questions from **SECTION B**.

SECTION A (COMPULSORY)

1. a) Distinguish between the following:

   i) monoculture and continuous cropping **[6 Marks]**

   ii) polyculture and multiple cropping **[6 Marks]**

   b) Assuming fertilizer recommendation of 250 kg ha^{-1} Compound D (7-14-7, 8% S), 50 kg ha^{-1} single super phosphate (20% P_2O_5, 12% S), 400 kg ha^{-1} ammonium nitrate (NH_3NO_4), Calculate the rate of application (kg ha^{-1}) of:

   i) Nitrogen **[4 Marks]**

   ii) Phosphorus **[6 Marks]**

   iii) Potassium **[2 Marks]**

   iv) Sulphur **[2 Marks]**

   c) With the aid of examples discuss the implications of failure to observe the 4-R principle of nutrient stewardship in crop production. **[24 Marks]**

SECTION B

2. a) Discuss the implications of modification of natural ecosystem characteristics by modern conventional agriculture. **[15 Marks]**

   b) Critique the viewpoint that "The world's human carrying capacity would be increased if humans directly consume grain crops." **[10 Marks]**

3. Compare and contrast soil fertility management under organic farming and conservation agriculture. **[25 Marks]**

4. Examine the Green Revolution within the context of sustainable crop production. **[25 Marks]**

END OF PAPER