

**UNIVERSITY OF SOUTH AUSTRALIA
SCHOOL OF GEOINFORMATICS, PLANNING AND BUILDING
GEODETIC SCIENCE 4 EXAMINATION
SEMESTER 1, 2001**

TIME ALLOWED: 2 HOURS AND TEN MINUTES READING TIME

GENERAL INSTRUCTIONS

ATTEMPT ANY THREE QUESTIONS

ALL QUESTIONS ARE OF EQUAL VALUE

QUESTION 1:

Define with the aid of diagrams where applicable:

- a) gravity and gravitational force
- b) the potential at a point P due to an irregular shaped body
- c) normal potential and disturbing potential
- d) geops and the geoid
- e) spheroids and the reference ellipsoid

Detail the factors that effect the values of the terms in c) above.

QUESTION 2:

Define with the aid of diagrams the following height systems and, discuss their significance, use and where applicable their inter-relationship:

- geopotential numbers
- dynamic heights
- orthometric heights
- Helmerts heights
- normal heights
- heights above the ellipsoid

QUESTION 3:

What is the gravity anomaly?

Describe and discuss the use and inter-relationship of the various types of isostatic and non-isostatic gravity anomalies.

QUESTION 4:

Stokes' Formula may be represented by:

- a) What is the significance of this formula?
- b) Show a general shape of the function $S(\lambda)$
- c) What assumptions are made in deriving this formula and if these assumptions are incorrect what effects do they have?
- d)