Uva Wellassa University, Sri Lanka
Faculty of Science and Technology
Science and Technology Degree program
1st Semester Examination – March/April 2013

Uva Wellassa University

MRT 305-3 Mathematical and Statistical Methods in Mineral Sciences

Part B

Instructions to candidates

Number of Questions: **Five (05)**

Answer all **Five (05)** questions

Time allocation: **One (01)** hour

Total marks allocated: 100

Answer **Part B** in a **separate answer book**

1. What is Geostatistics? With examples selected from different scientific disciplines explain major advantages and limitations of geostatistics usage.

(25 marks)

2. Select four (4) items from below and briefly discuss

   i. Random variable

   ii. spatial continuity

   iii. kriging

   iv. anisotropy

   v. detrending

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(25 marks)

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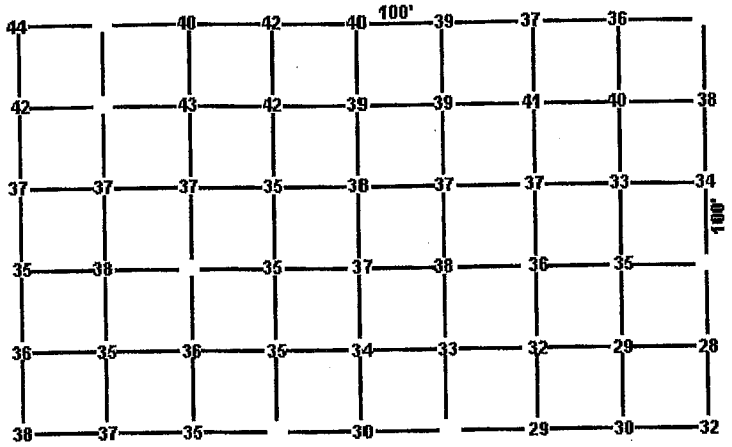
3. Using the following sampling point distribution pattern, find all pairs of samples at 100 ft intervals and calculate the experimental semivariogram g(100) for E-W direction.



(25 marks)

4. Describe Linear, Exponential, Spherical and Gaussian distributions with respect to **g**, with **properly labelled diagrams** and **relevant equations**,

(25 marks)

5. Draw variograms to satisfy following conditions.

   i. Nugget (=0.4), sill (=0.9) and range (100)

   ii. Pure nugget effect no spatial correlation

   iii. Spatial correlation in combination with pure random variation

   iv. High spatial correlation with no random effects

(25 marks)