UNIVERSITI SAINS MALAYSIA

Second Semester Examination
Academic Session 2009/2010

April/Mei 2010

EBS 328/3 - Prospecting Geochemistry
[Geokimia Carigali]

Duration : 3 hours
[Masa : 3 jam]

Please ensure that this examination paper contains SIX printed pages before you begin the examination.
[Sila pastikan bahawa kertas peperiksaan ini mengandungi ENAM muka surat yang bercetak sebelum anda memulakan peperiksaan ini.]

This paper consists of SEVEN questions.
[Kertas soalan ini mengandungi TUJUH soalan.]

Instruction: Answer **FIVE** questions. Answer **QUESTION ONE** and **FOUR** other questions. If candidate answers more than five questions only the first five questions answered in the answer script would be examined.
*[**Arahan**: Jawab **LIMA** soalan. Jawab **SOALAN SATU** dan **EMPAT** soalan lain. Jika calon menjawab lebih daripada lima soalan hanya lima soalan pertama mengikut susunan dalam skrip jawapan akan diberi markah.]*

The answers to all questions must start on a new page.
[Mulakan jawapan anda untuk semua soalan pada muka surat yang baru.]

You may answer a question either in Bahasa Malaysia or in English.
[Anda dibenarkan menjawab soalan sama ada dalam Bahasa Malaysia atau Bahasa Inggeris.]

In the event of any discrepancies, the English version shall be used.
[Sekiranya terdapat sebarang percanggahan pada soalan peperiksaan, versi Bahasa Inggeris hendaklah diguna pakai.]

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1. Complete the following exploration diagram. (You may want to copy the format into your answer script)

Lengkapkan gambarajah carigali berikut. (Anda perlu menyalin format tersebut ke atas kertas jawapan anda).

	Decision ***Keputusan***	**Exploration Stage** ***Tahap Carigali***	**Information Gathered** ***Maklumat Terkumpul***	**Who Involved** ***Siapa Terlibat***	**Purpose** ***Tujuan***
1					
2					
3					
4					
5					
6					

(20 marks/*markah*)

2. Briefly describe the following items:

(Perihalkan perkara berikut):

(a) Pathfinder elements *(unsur petunjuk)*
(b) Path indicator elements *(unsur penunjuk)*
(c) Regional background *(nilai latar kawasan)*
(d) Local background *(nilai latar tempatan)*
(e) Ion mobility *(kelincahan ion)*
(f) Leakage anomaly *(anomali tiris)*
(g) Significant anomaly *(anomali penting)*
(h) Non-significant anomaly *(anomali tak penting)*
(i) Accuracy *(kejituan)*
(j) Precision *(kepersisan)*

(20 marks/*markah*)

3. Describe the meaning of primary and secondary dispersion? How primary and secondary dispersion developed and discuss how they are important to mineral exploration? (Use diagram or sketches to illustrate your answer).

Huraikan apa yang dimaksudkan dengan serakan primer dan sekunder. Huraikan bagaimana serakan primer dan sekunder terjadi dan bincangkan bagaimana ia penting di dalam carigali mineral. (Gunakan rajah atau lakaran untuk mengilustrasikan jawapan anda).

(20 marks/*markah*)

4. Sketch and discuss the field conditions that may warrant the use of geochemical exploration.

Lakar dan bincangkan keadaan lapangan yang menuntut kaedah geokimia carigali digunakan.

(20 marks/*markah*)

5. There are three types of survey normally being carried in the geochemical exploration program: Reconnaisance, Orientatation, and Detailed. Draw three columns on your answer script, and discuss using the following items: (1) objectives, (2) what sampling media would you recommend, (3) the sampling grid, (4) sampling density, (5) duration, (6) cost/expenditures.

Terdapat tiga jenis tinjuan yang lazim digunakan di dalam cari gali geokimia: tinjauan awal, orientasi dan terperinci. Lakarkan tiga kolum pada kertas jawapan anda dan bincangkan item berikut; (1) matlamat/tujuan, (2) media pensampelan yang disarankan, (3) rid pensampelan, (4) ketumpatan sampel, (5) tempoh, (6) kos/perbelanjaan.

(20 marks/*markah*)

6. Given the following table: content of selected elements in granites associated with tin mineralization in Tasmania, Australia. Observe the data carefully and write your comments and conclusions based on your observations. You may want to consider other options of presenting your data that may have important bearing on your conclusions.

Jadual berikut diberikan: kandungan unsur tertentu di dalam batuan granit yang terjadi dengan pemineralan timah di Tasmania, Australia. Perhatikan data dengan teliti dan tulis komen dan kesimpulan anda berdasarkan pemerhatian anda tadi. Anda mungkin perlu mempertimbangkan opsyen lain dalam mempersembahkan data yang mungkin mempunyai kaitan penting dengan kesimpulan anda.

Sample No	**K (%)**	**Mg (%)**	**F (%)**	**Li (ppm)**	**Rb (ppm)**	**Sr (ppm)**	**Sn (ppm)**
1	4.1	0.24	0.11	46	360	95	6
2	4.0	0.23	0.15	46	355	85	5
3	4.1	0.24	0.14	46	355	105	6
4	4.0	0.19	0.10	23	385	30	5
5	3.4	0.21	0.21	70	425	65	16
6	3.9	0.22	0.40	46	365	75	9
Average barren granite (Sample 1-6)	**3.9**	**0.22**	**0.14**	**46**	**365**	**75**	**9**
7	3.9	0.04	1.4	235	1105	4	1820
8	4.2	0.03	1.4	232	1115	4	740
9	3.9	0.03	0.11	46	840	6	66
10	4.2	0.03	1.3	209	1225	4	61
11	3.1	0.03	0.78	164	935	7	52
12	3.6	0.04	1.1	164	980	6	28
Average mineralized granite (Sample 7-12)	**3.8**	**0.04**	**1.02**	**186**	**1035**	**5**	**49**

(20 marks/*markah*)

7. Given the following diagram (Figure 1) of lateral distribution of arsenic at selected depths along a traverse, and using -80 mesh soil fraction, give your comments as regard to the various plots. Pay your attention on the sensitivity of the plot to possible presence of mineralization, say gold.

Diberikan rajah berikut (Rajah 1) yang menunjukkan taburan arsenik pada kedalaman tertentu sepanjang sebuah trabas menggunakan sisihan tanah -80 mesy. Tulis komen anda berdasarkan plot-plot tersebut. Beri tumpuan anda kepada sensitiviti plot terutama kepada kewujudan pemineralan seperti emas.

(20 marks/*markah*)

Figure 1

Rajah 1

Lateral Distribution of Arsenic at Selected Depths Along Traverse Minus 80-Mesh Soil Fraction

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