

University of Colombo

Faculty of Arts

General Degree Examination in Arts (Study Stream) Part I 2016/2017

First Semester Final Examination

Time: 3 Hours

GYG 2116 - Geo Environmental Techniques

Answer four questions selecting at least one from each part

Drawing sheets and graph papers will be provided

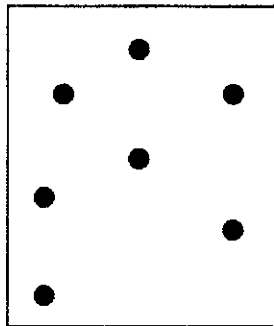
Use of calculator is allowed

Part I

1.
 - I. Explain briefly the following pairs with sketch diagrams wherever necessary
 - a) Vertices - Edges
 - b) Accessibility - Connectivity

(6 Marks)
 - II. Find out the minimum number of edges and maximum number of edges needed to link the nodes given in diagram I

Diagram 1



(03 Marks)

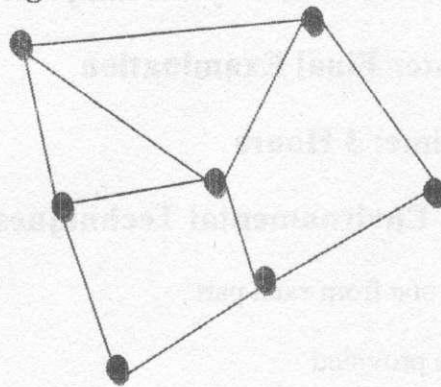
- III. Interpret the results obtained from different measures of connectivity given bellow.

Measures	Result
Beta index	0.8
Gamma index	0.6 / 60%
Alpha index	0.3 / 30%

(03 Marks)

- IV. Using diagram no- 2 given below find out the number of actual circuits and maximum possible number of circuits.

Diagram 2

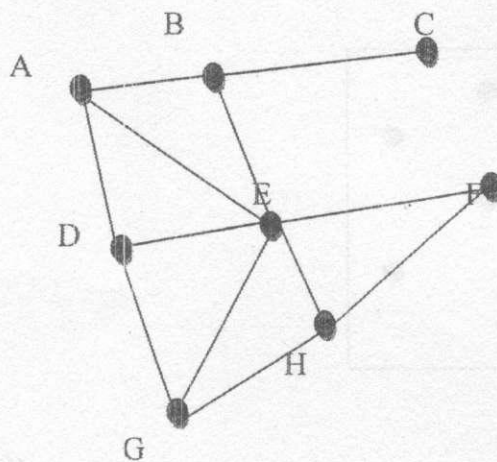


(03 Marks)

- V. Find out the most accessibility centre and least accessibility center of the transportation network shown in diagram no- 3, using an appropriate technique.

(10 Marks)

Diagram 3



(Total marks 25)

2.
 - I. What do you understand by the term 'nearest neighbour analysis'? (03 Marks)
 - II. What is R_n value? How is it obtained? Explain this with the application of the relevant formula. (04 Marks)

III. Interpret the R_n values obtained from three studies on settlement pattern

- a) 0.27
- b) 2.15
- c) 1.64

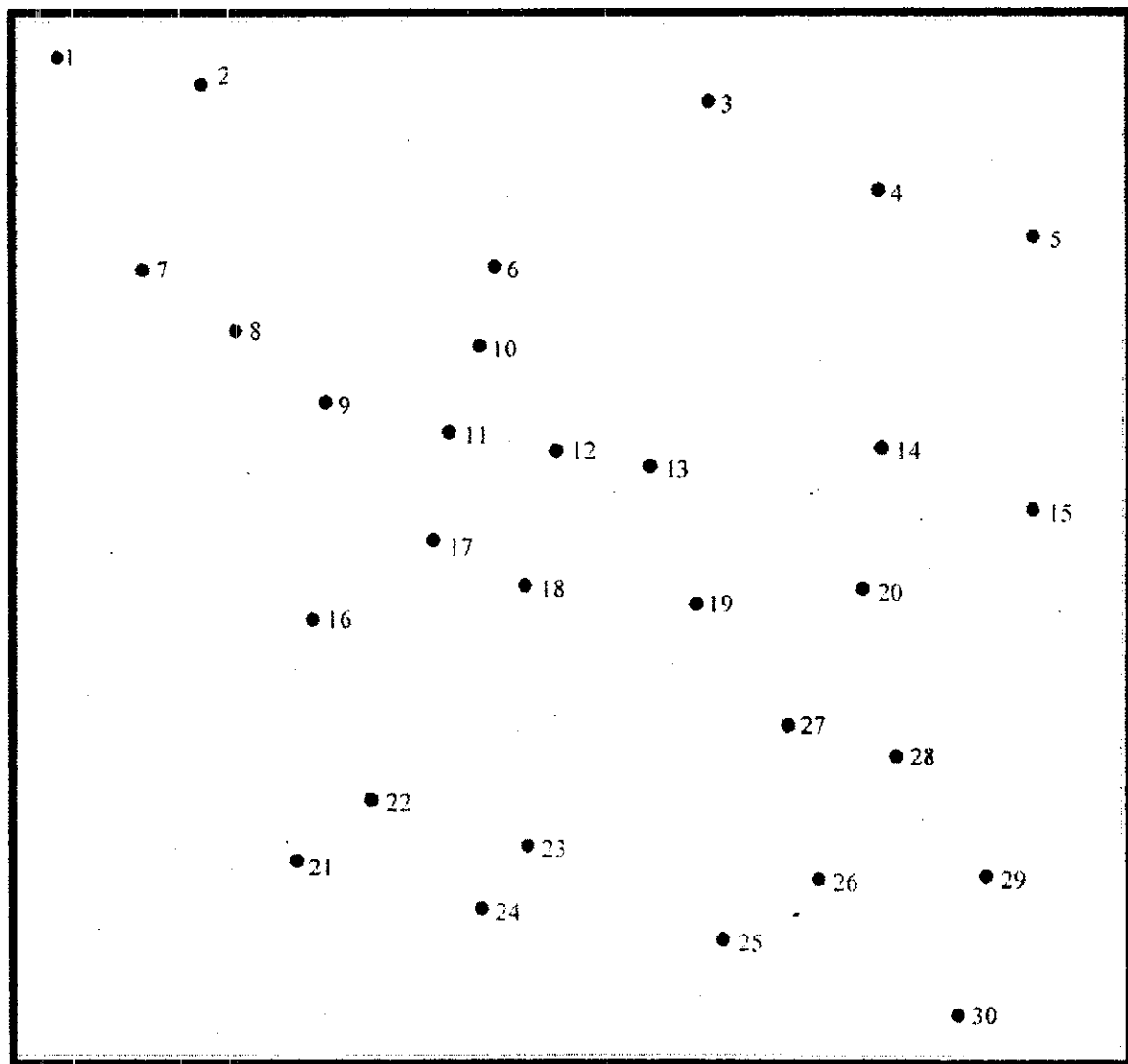
(03 Marks)

IV. Map no 01 shows the settlement pattern of an area. Find out the settlement pattern shown in the area using a suitable technique. All calculations should be shown clearly.

(15 Marks)

(Total Marks 25)

Map No 01



1:50,000

Part II

3.

I.

a. Explain the uses of the following with suitable diagrams

- i. Principal points on the aerial photographs
- ii. Forward overlap of aerial photographs

(4 Marks)

b. State the differences between vertical and oblique aerial photographs.

(4 Marks)

c. Compute the true extent in sq.km for an area which has 5 cm length and 3 cm width in an aerial photograph taken at the scale 1: 30,000.

(4 Marks)

d. Explain the advantages of an aerial photograph in obtaining the natural and manmade features of the ground.

(4 Marks)

II. Mark and name the following features pertaining to a vertical aerial photograph in a suitable diagram.

- a. Principal point (PPP)
- b. Angle of view (AV)
- c. Plumb line (PL)
- d. Isocenter (IC)

(4 Marks)

III. Using the information given below compute the scale of the aerial photograph.

- Flying height 3km
- Focal length 30cm

(5 Marks)

(Total marks 25)

4.

- I. Compare topographic maps with aerial photographs.

(3 Marks)

- II. Distinguish air photo interpretation from photogrammetry

(3 Marks)

- III. "Though aerial photographs are considered as central projection of landscape photographed, relief displacement reduces its validity considerably" explain this statement with diagrams.

(5 Marks)

- IV. Using the information given below calculate the extent of the area in sq.km that is freshly covered in an aerial photograph.

- Size of the aerial photograph 18cm×18cm
- Forward overlap 60%
- Side overlap 20%
- focal length 150mm
- Flying height above sea level 8000m
- Height of the place photographed 500m

(5 Marks)

- V. Calculate the focal length of the camera using the information given below.

- Scale 1:60,000
- Flying height above sea level 10500m
- Height of the place photographed 900m

(5 Marks)

- VI. Write brief notes any two of the following

- a. Films used in aerial photographs
- b. Marginal information (Data strips) incorporated in an aerial photograph
- c. Classification of aerial photograph based on angle of view

(2× 2 = 4 marks)

(Total marks 25)

Part III

5.

- I. "Surveying is the method of repetition of ground features in a plan to a scale"
Explain briefly this statement.

(03 Marks)

- II. Name five types of surveying in terms of instruments used.

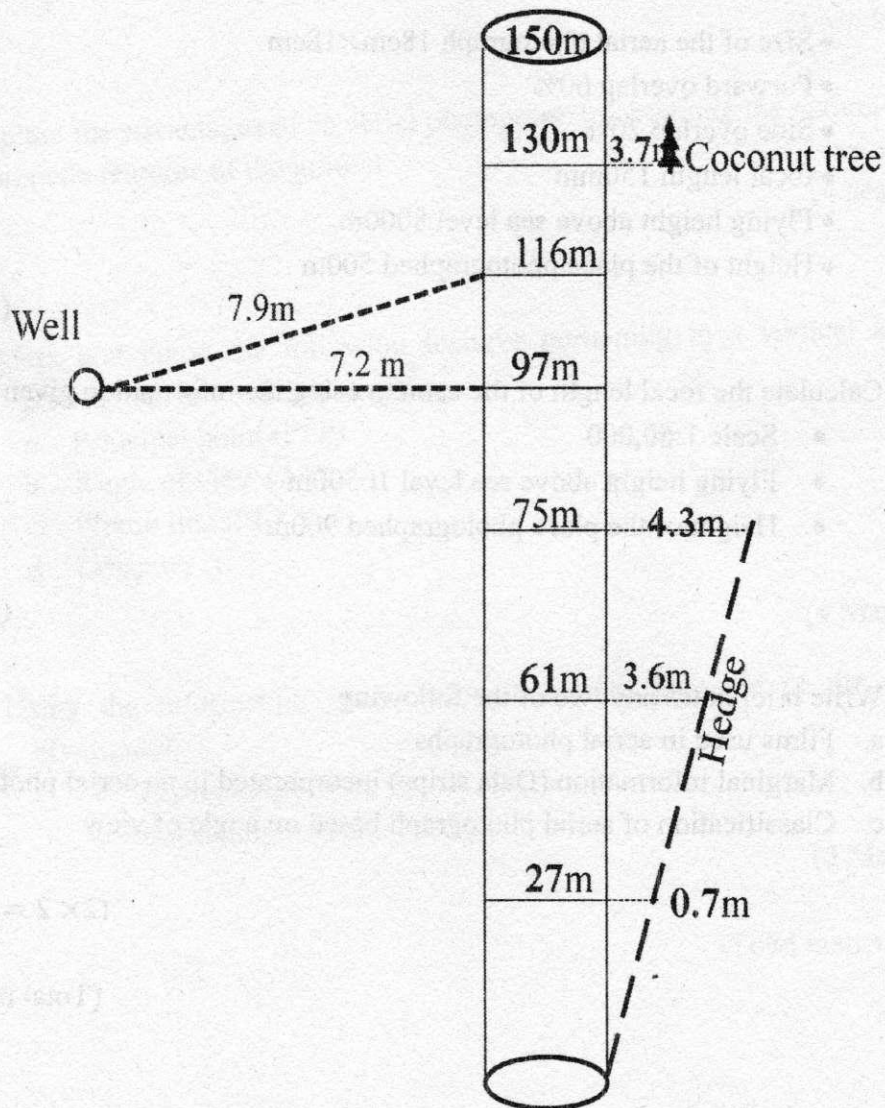
(03 Marks)

- III. Explain with sketch diagrams how off-set and arc distances are measured in the field when a chain survey is conducted.

(04 Marks)

- IV. Describe the features given in diagram 4 that comprises a survey line measured in the field under a chain survey.

Diagram 4



(05 Marks)

- V. Field measurements pertaining to a chain survey are given below. Construct a plan using those field measurements at the scale of 1cm = 40meter. Chain distances are given in meters. The North of the area is parallel to the CD line in which point C is directly north of point D.

Survey line	Distance (in meters)
AB	280
AC	240
BD	200
CD	220
BC (Diagonal)	260

The main triangle in the field is formed when survey station B,C and D are joined together.

(10 Marks)

(Total Marks 25)

6)

- I. Describe the structure of a Prismatic compass with a sketch diagram (6 marks)

- II. Explain the following pairs with sketch diagram wherever necessary

- a. Forward bearing - Back Bearing
- b. Open traverse - Closed traverse
- c. Off- set distance - Arc distance
- d. class room work - field work

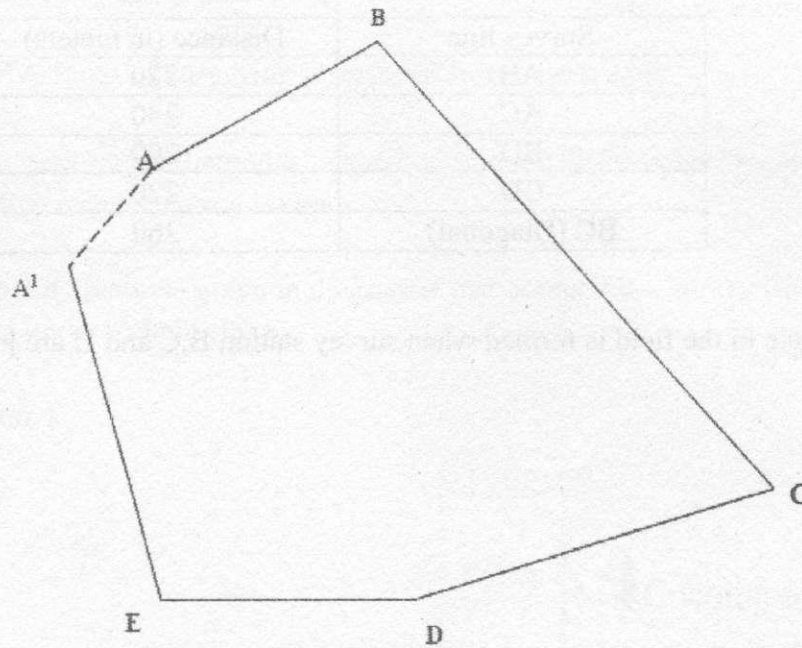
(8 Marks)

- III. a. Why an error of closure is occurred when construct a closed traverse?

(3 Marks)

- b. Rectify the error of closure shown in the diagram 5 using a diagrammatic method

Diagram 5



(8 Marks)

(Total Marks 25)

Part IV

7)

Answer the following questions using synoptic weather chart No. 01 and diagram 6

- (i) Mark the weather information given in synoptic weather chart No. 1 on respective weather stations in diagram 6 (Attach your diagram to the answer script).

(20 Marks)





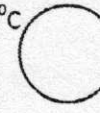




- (ii) Write a brief note using the information given for atmospheric pressure, wind speed and cloud cover in Chart No.1

(5 Marks)

Synoptic weather chart No 01

Weather Centre	TT (°C)	PPP	dd	ff	N	CL	CM	CH	WW
1	30	011	NE	7	2	Cb	Ac	Ci	Continuous rains
2	28	928	NNE	12	4	Cu	Ac	-	Drizzle
3	25	998	WSW	10	8	Cb	-	-	Continuous heavy rains
4	27	022	ENE	5	5	Cu	As	Ci	-
5	32	005	SW	8	7	Cu	-	Cc	Drizzle
6	26	027	SSW	11	3	St	Ac	-	-
7	30	026	S	4	6	St	-	-	Drizzle
8	30	997	SE	9	1	Cu	As	Ci	Drizzle
9	33	988	ESE	3	3	Cb	-	-	Continuous rains
10	24	024	WNW	2	8	Cb	-	Cc	Continuous light rains

Diagram 6

1. 30°C 	2. 28°C 	3. 25°C 	4. 27°C 	5. 32°C 
6. 26°C 	7. 30°C 	8. 30°C 	9. 33°C 	10. 24°C 