KATHMANDU UNIVERSITY
End Semester Examination
February/March 2019

05 MAR 2019

Level : B.E.
Year : II
Time : 2 hrs. 30 mins.

Course : GEOM 202
Semester : I
F. M. : 40

SECTION "B"
[6 Q. × 4 = 24 marks]

Attempt *ANY SIX* questions. Assume suitable data if necessary.

1. a. Define control survey. What is the purpose of establishing control station? [1+1]
   b. How are different control points classified by the Survey Department of Nepal? Explain in brief. [2]

2. a. In order to find the difference in elevation between two points A and B, a level was set up on the line AB, 50 m from A and 1300 m from B; points A and B being on the same side of the instrument. The readings obtained on staff held at A and B were 0.435 and 3.950 respectively. Find the true difference in elevation between A and B. [2]
   b. Find the elevation of station B from the following data: [2]

	Station A	Station B
Time	9 - 11 a.m.	10 a.m.
Barometer reading	75 - 75.2 cm	72 cm
Temperature of air	16 - 18°C	8°C
Elevation	50.0 m	?

3. a. What are the factors affecting sensitivity of bubble tube? The staff reading taken on a staff held at a distance of 80 m from the instrument with the bubble central was 1.455 m. When the bubble was moved 6 divisions out of the center, the staff reading observed was 1.487 m. If the length of one division is 2 mm, find the radius of curvature, and the sensitivity of the tube. [1+1]
   b. Explain the process of temporary adjustment of a theodolite. [2]

4. The following observations were made for a closed traverse round an obstacle. Due to obstructions, length of lines DE and EA could not be measured. Find out the missing lengths. [4]

Line	Length	Whole Circle Bearing(W.C.B.)
AB	500	98°30'
BC	620	30°20'
CD	468	298°0'
DE	?	230°30'
EA	?	150°10'

5. What are deficiencies in an open traversing? Mention their remedies. What are the different factors to be considered while selecting traverse station? [1+1+2]

6. What are the objectives of the triangulation surveying? How can we extend the baseline in triangulation survey? [2+2]

7. Differentiate between [2+2]
   a) Triangulation and Trilateration
   b) Geodimeter and Tellurometer

SECTION "C"

[2 Q. × 8 = 16 marks]

Attempt *ANY TWO* questions. Assume suitable data if necessary.

8. a. From a satellite station S which was10 m from station A, following directions were observed.
   A 00°00'00"
   B 140°20'20"
   C 245°30'25"
   D 305°15'35"
   If the lengths of sides AB, AC and AD are respectively 3350.54 m, 4132.43 m and 3145.83 m, respectively, determine the directions of AB, AC and AD. [4]

   b. The altitudes of two proposed stations A and B 100 km apart, are respectively 420 m and 700 m. The intervening obstruction situated at C, 70 km from A has an elevation of 478 m. Ascertain if A and B are intervisible, and if necessary, find by how much B should be raised so that the line of sight must nowhere be less than 3 m above the surface of the ground. [4]

9. a. Define intersection. What are the precautions to be taken while doing theodolite resection? [1+2]

   b. Control stations have the following coordinates: [5]

Points	Easting (m)	Northing (m)
W	2876.24	8754.11
F	3810.8	7997.09
K	2959.39	7487.09

The theodolite is set up at station T, which is situated within the triangle WFK, the target at F is sighted and the horizontal circle is set to zero. Angle readings are taken to the other control stations as follows:
Stn K 82°28'14" and Stn W 219°01'09"
Determine the coordinates of the station T.

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10. a. Write short notes on: [2+2]
i. Adjustment of a braced quadrilateral
ii. Check angles in trilateration

b. Following is the page of a level field book. The readings in the level book were written with pencil and some of these got erased. The erased readings are marked with question marks. Calculate the missing readings. [4]

STATION	B.S.	I.S.	F.S.	Rise	Fall	R.L.	Remarks
1	?					150.000	B.M.
2		2.457			0.827	?	
3		2.400		0.057		?	
4	2.697		?		?	148.070	C.P.
5	?		2.051	0.646		148.716	C.P.
6		2.500		1.068		149.784	
7		2.896			?	149.388	
8		?			0.124	?	
9			2.672	0.348		149.612	