KATHMANDU UNIVERSITY
End Semester Examination
July/August 2024

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

06 AUG 2024

Course : GEOM 205
Semester : I
F. M. : 40

SECTION "B"
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[8Q. × 5 = 40 marks]

Attempt *ALL* questions. Assume suitable data when necessary. Figures in the braces indicate full marks.

1. What is a contour line? What factors must be considered when selecting the contour interval to be used for a given topographic map? Explain in brief. Also, explain with proper illustration how would you distinguish between a depression and summit by studying the nature of contour. [1+3+1]

2. Derive the expression for determining the elevation of staff station and its distance from instrument station when staff is held vertical and the vertical angle is of eleva- tion. Sketch the illustrative diagram. [5]

3. What is resection? Resection problem can be solved by different methods of orien- tation, out of which resection after orientation by back sighting is one. Explain its process with proper illustration. Also, enlist some precautions that should be taken while performing resection after orientation by back-sighting. [1+3+1]

4. What do you understand by cartographic generalization? Explain in brief the four major objectives of cartographic generalization. Also, differentiate between concep- tual and graphic generalization. [1+2+2]

5. The readings given below were made with a tacheometric theodolite having a multi- plying constant of 100 and no additive constant. The reduced level of station A was 100.00 m and the height of the instrument axis is 1.35 m above ground. Calculate the gradient expressed as the horizontal distance one meter rise or fall vertically between the stations B and C. [5]

Station	To	Whole Circle Bearing	Vertical Angle	Stadia Readings
A	B	$48^0 00$	$+ 11^0 30$	2.048, 1.524, 1.000
	C	$138^0 00$	$- 17^0 00$	2.112, 1.356, 0.600

6. Suppose you have been involved as a Geomatics Engineer and it is required to make a topographic map of Kavre Municipality. Explain in detail the entire process from reconnaissance to the final map printing to accomplish the task. Your explanation should cover the major steps and include relevant standards and best practices at each stage. [5]

P.T.O.

7. Two sets of tacheometric readings were taken from an instrument station A (the reduced level of which was 100.06 m) to a staff station B.
   a. Instrument P - multiplying constant 100, additive constant 0.06 m, staff held vertical
   b. Instrument Q - multiplying constant 90, additive constant 0.06 m, staff held normal to the line of sight

Instrument	At	To	H.I	Vertical Angle	Stadia Readings
P	A	B	1.5 m	26^0	0.755, 1.005, 1.255
Q	A	B	1.45 m	26^0	?, ?, ?

What should be the stadia readings with instrument Q? [5]

OR

The coordinates of three stations A, B and C are given in table below. A point O is set up inside the triangle and the observations are taken, the observations of which are given below. Calculate the coordinates of station O. [5]

Station	Easting (m)	Northing (m)
A	24078.31	29236.48
B	26266.48	31493.20
C	28377.67	29661.04

Adjusted Value of $BOA = 142^0 48' 32''$ Adjusted Value of $COB = 92^0 12' 22''$ Adjusted Value of $AOC = 124^0 59' 06''$

8. Write short notes on following: (***ANY TWO***) [2×2.5 = 5]
   a. Working operations of plane table
   b. Total Station and its parts
   c. Layer tinting and Hachuring

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Marks Scored:

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Exam Roll No. :
Time: 30 mins.
F. M. : 10
Date 06 AUG 2024
Registration No.:

SECTION "A"
[20Q. × 0.5 = 10 marks]

Choose and encircle the most appropriate option from each set of choices

1. The principle of plane table survey is:
   a. Parallelism b. Triangulation c. Traversing d. Trilateration

2. When contours of different elevation cross each other, it indicates a/an:
   a. Vertical cliff b. Saddle c. Overhanging cliff d. Valley

3. The purpose of stadia hairs in diaphragm of a tacheometer is to:
   a. Measure distance b. Measure vertical and zenithal an- gle
   c. Measure horizontal angle d. Both (a) and (b)

4. The value of multiplying constant in a tachemoeter is:
   a. f/i b. i/f c. f+d d. f-d

5. In order to make multiplying constant of a tacheometer 100, an angle of $34^0 22''$ is set. This angle is called as:
   a. Anallectic angle b. Parallactic angle c. Multiplying angle d. Stadia angle

6. Which of the following is also called graphical method in three point problem?
   a. Bessel's method b. Trial and error method
   c. Tracing paper method d. Back orientation method

7. In which situation of the following, the danger circle should be cared for?
   a. Outside resection b. Inside resection
   c. Two-point problem d. All of the above

8. The error contained in multiplying constant of a tacheometer should not exceed:
   a. 1 in 100 b. 1 in 5000 c. 1 in 500 d. 1 in 1000

9. A series of closed contours on a map indicates:
   a. A closed traverse b. A depression c. A summit d. Either (b) or (c)

10. For survey of broken boundaries with a plane table, the most appropriate method will be:
    a. Open traversing b. Intersection c. Radiation d. Resection

Fill in the blanks using appropriate words.

11. If the value of stadia interval is 1.5 mm and the focal length of the objective lens is 30 cm, then the value of multiplying constant is ____.

12. The ruling or bevelled edge of a plane table alidade is called as ____.

13. The H and V scales of Beaman stadia arc have their central points marked at and _____respectively.

14. The axis about which telescope revolves is called ___.

15. For an original map with details accommodated in 4 sheets, the number of new sheet(s) re- quired to accommodate the details in a new map reduced by 50% is(are) _____.

Write T for TRUE and F for FALSE statement.

16. As a map is enlarged, the plotting error also increases. [ ]

17. The steepest slope of terrain at any point on a contour is represented along the normal of the contour at that point. [ ]

18. The smaller the scale of the map, the more detail can be represented and the less important generalization becomes. [ ]

19. Layer tinting is the most suitable method of representing the elevation and shape of the relief on large-scale maps [ ]

20. The steeper the slope, the darker is the shade in hill shading. [ ]