

KATHMANDU UNIVERSITY
End Semester Examination
March/April, 2025

Marks Scored:

Level : B.E.

Year : II

Exam Roll No. :

Time: 30 mins.

Course : GEOM 205

Semester : I

F. M. : 10

Registration No.:

Date : 13 APR 2025

SECTION "A"

[20Q. × 0.5 = 10 marks]

Choose and **encircle** the most appropriate answer.

1. Which of the following is an example of a large-scale map?
a. 1:25000 b. 1:10000 c. 1:50000 d. 1:100000
2. What happens when the map is enlarged?
a. The scale decreases b. The scale increases
c. The map loses its original shape d. The amount of detail decreases
3. What is the primary function of displacement operation in generalization?
a. To classify features only by importance
b. To maintain feature relationships despite positional shifts
c. To simplify data for thematic clarity
d. To prioritize aesthetic quality over accuracy
4. Which of the following is not a graphic generalization?
a. Enlargement b. Displacement c. Enhancement d. Simplification
5. Which of the following colors is used to denote contour above the snow line?
a. Black b. Brown c. Blue d. Gray
6. What is the main drawback of using hachuring for relief representation?
a. It does not indicate exact elevation values
b. It does not show the direction of slope
c. It is only applicable for small-scale maps
d. It requires the use of a digital elevation model
7. What is the main limitation of compass orientation in plane table surveying?
a. It requires long distance sighting b. It cannot be used in open areas
c. It takes too much time d. It is affected by local magnetic attraction
8. Which of the following is a graphical method in plane table method?
a. Bessel's method b. Lehmann's method
c. Tracing paper method d. Trial and error method
9. The two-point problem as compared to three-point problem is:
a. More accurate b. Quicker c. More Laborious d. None

10. The intercept of a staff:
- Is maximum, if the staff is held truly normal to the line of sight
 - Decreases, if the staff is tilted away from normal
 - Decreases, if the staff is tilted towards normal
 - Is minimum, if the line of sight is held truly normal to the line of sight
11. The stadia method in tacheometry is used to determine:
- Horizontal angles
 - Vertical angles
 - Horizontal distances
 - Horizontal and vertical distances
12. The staff intercept will be:
- Greater, farther off the staff is held
 - Smaller, farther off the staff is held
 - Greater, nearer the staff is held
 - Same, wherever the staff is held

Fill in the Blanks.

13. If the map at the scale of 1:500 is changed to 1:2500, then the percentage of enlargement or reduction is _____ Enlargement/Reduction.
14. _____ corner is assumed as the location of light source in a hill-shade map, giving the map a light-shadow effect.
15. The contour interval on a map drawn to a scale of 1:50,000 is _____.
16. If the contour interval on a map is 12 m and the upward gradient of 1 in 20 is required to be drawn between two points, then the required horizontal equivalent is _____.
17. The value of v-scale in plane table surveying varies from _____ to _____.
18. If the focal length of an object glass is 25 cm, stadia interval is 1.25 mm and the distance from object glass to the trunnion axis is 15 cm, then the additive constant is _____.
19. Subtense bar is used to measure _____.
20. The topographical base maps of Nepal were prepared at the total of _____ sheets.

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F. M. : 40

SECTION "B"

Attempt *ALL* questions:

1. Define map scale. Why is scale considered a fundamental aspect of topographical mapping and how does it influence map detail representation? [1+3]
2. How does detail generalization impact the readability and usability of topographical maps? Differentiate between graphical and conceptual generalization. Describe the factors that affect generalization. [2+2+3]
3. What do you understand by relief representation? How do different relief representation techniques impact the interpretation of terrain features? Explain. [1+3]
4. How do the characteristics of contour lines help in interpreting terrain features? Explain the importance of contour maps in urban planning and engineering projects. [2+3]
5. Describe the principle of plane table surveying. Explain the working operations involved in it. [2+3]
6. Define resection. Explain the process of resection involved in plane table surveying using the trial-and-error method. [1+3]
7. Derive an expression for the reduced level (RL) of a point when the line of sight is inclined and the staff is held perpendicular to the line of sight. Provide separate derivations for both elevation and depression cases along with a clear and labeled diagram. [4]
8. Determine the gradient from a point P to another point Q from the following observations made with a tacheometer fitted with anallactic lens. The constants of the instrument were 100 and 0, and the staff was held vertically. [3]

Instrument Station	Staff Station	Bearing	Vertical Angle	Staff Readings
R	P	130 ⁰	+10 ⁰ 32'	1.255, 1.810, 2.365
	Q	220 ⁰	+5 ⁰ 06'	1.300, 2.120, 2.940

P.T.O.

9. Following observations were recorded with a tacheometer fitted with an anallactic lens. Calculate the reduced levels of change point and of station T. The staff was held vertical during the observations and RL of BM was 500 m. [4]

Instrument Station	H. I.	Staff Station	Vertical Angle	Staff Readings
O	1.500	BM	$-4^{\circ}30'$	1.250, 1.400, 1.550
O	1.500	CP	$+6^{\circ}12'$	1.550, 1.750, 1.950
T	1.350	CP	$-7^{\circ}45'$	1.390, 1.550, 1.710

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SECTION "A"

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Choose and **encircle** the most appropriate answer. Symbols have their usual meanings.

- A path line describes
 - The velocity direction at all points on the line
 - The tangent on it gives the velocity
 - The path over a period of time traced by a single particle
 - The instantaneous position of all particles that have passed a point
- In _____ flow, fluid characteristics changes with distance.
 - Steady
 - Unsteady
 - Steady Uniform
 - Non-uniform
- Dynamic viscosity (μ) has the dimensions as _____.
 - MLT^2
 - $ML^{-1}T^{-1}$
 - $ML^{-1}T^{-2}$
 - $M^{-1}L^{-1}T^{-1}$
- The center of gravity of the volume of the liquid displaced is called _____.
 - Center of pressure
 - Center of buoyancy
 - Metacenter
 - Centroid
- The torque exerted by the water on sprinkler is calculated based on _____.
 - Momentum Equation
 - Bernoulli's Equation
 - Moment of momentum Equation
 - Reynold's equation of motion
- The equation of discharge over a right angled triangular notch with $C_d = 0.6$ is
 - $Q = 1.58H^{5/2}$
 - $Q = 1.48H^{5/2}$
 - $Q = 1.417H^{5/2}$
 - $Q = 2.5H^{3/2}$
- The vertical pressure force on a curved surface is equal to _____.
 - Volume of liquid
 - Weight of supported liquid
 - Area projected on a vertical plane
 - Area projected on a horizontal plane
- If the density of a fluid changes from point to point in a flow region, it is called _____.
 - Steady flow
 - Unsteady flow
 - Compressible flow
 - Irrotational flow
- Coefficient of discharge C_d is equal to _____.
 - C_c/C_v
 - C_v/C_c
 - $C_c * C_v$
 - $C_c + C_v$

