KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2019

Marks Scored:

Level : B.E.
Year : II
Course : GEOM 205
Semester : I
Exam Roll No. :
Time : 30 mins.
F. M. : 10
Registration No.:
Date : FEB 25 2019

SECTION "A"
[20 Q. × 0.5 = 10 marks]

Choose and encircle the best alternative from the given choices:

1. The scale of a map was changed from 1: 60000 to 1: 12000. The change percentage is:
   a) 5% b) 250% c) 50% d) 500%

2. The contour gradient is .....
   a) a line with constant altitude.
   b) slope of a particular contour line.
   c) a line joining the points on different contours along the same gradient.
   d) a line moving in a constant direction.

3. Which of the following is mechanical method of scale reduction and enlargement?
   a) Process Camera b) Pantograph
   c) Planimeter d) Proportional Compass

4. Which of the following contour interval is most suitable for a topographic map of scale 1:50,000?
   a) 10 cm b) 1 cm c) 1 m d) 10 m

5. If the spacing of cross-hairs in a stadia diaphragm of tacheometer is 18 mm, and the focal length of the object glass is 36 cm, the multiplying constant of the instrument is:
   a) 2 b) 20 c) 0.5 d) 100

6. One hectare of an area is equivalent to .....
   a) 10^2 m^2 b) 10^3 m^2 c) 10^4 m^2 d) 10^5 m^2

7. A planimeter is an instrument used for .....
   a) checking whether a given surface is plane.
   b) checking whether the plane table surface is level.
   c) finding areas from plans and maps.
   d) finding the slope of the given terrain.

8. A medium scale topographic map has scale .....
   a) smaller than 1:2 500 000.
   b) smaller than 1:250 000 to approximately 1:2 500 000.
   c) 1:25 000 to approximately 1:250 000.
   d) larger than 1:25 000.

9. Which of the following relief representation method enhances the three-dimensional appearance of a map by creating the illusion of depth?
   a) Contour b) Layer Tint c) Hill Shade d) Hachures

10. Distomat is an instrument which measures the distance based on the propagation of .....
a) Infrared waves b) Microwaves c) Radiowaves d) Lightwaves

11. If the scale of the map is 1:500, the inaccuracy on the ground due to plotting error is:
a) 125 cm b) 12.5 cm c) 1.25 cm d) 0.125 m

12. Which of the following is the largest one?
a) 1 m = 50km b) 1:42000 c) R.F. = 1:30000 d) 1cm = 50 m

13. The working edge of the plane table alidade is called .....
a) fiducial edge b) bevelled edge c) parallel edge d) linear edge

14. In the planimeter formula, the additive constant is considered when .....
a) the anchor point is inside the area being measured.
b) the anchor point is outside the area being measured.
c) the area is traced in the clockwise direction.
d) the area is traced in the counter clockwise direction.

15. The tangential method of tacheometry uses .....
a) the readings against all three cross hairs.
b) the readings against the top and bottom cross hairs only.
c) the reading against the middle cross hair only.
d) a constant intercept on the staff.

16. A total station is .....
a) a combination of electronic theodolite and digital level.
b) a combination of electronic theodolite and a tacheometer.
c) an electronic theodolite with levelling capabilities.
d) a digital theodolite combined with an EDM module.

17. A contour line .....
a) necessarily closes upon itself, even if outside the map.
b) is always an open curve, not closing upon itself.
c) may sometimes close.
d) may sometimes be an open curve not closing upon itself.

18. Direct method of contouring is .....
a) a quick method b) adopted for large areas
c) the most accurate method d) suitable for hilly regions

19. Which of the following orientation is done when there is only a single plotted position in the sheet?
a) Orientation by trough compass b) Orientation by back sighting
c) Orientation by Lehmann's rules d) Orientation by mechanical method

20. The range and accuracy of EDM instruments vary such that .....
a) short-range instruments have less accuracy.
b) short-range instruments have better accuracy.
c) high-range instruments have better accuracy.
d) the range and accuracy are the same for all instruments.

KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2019

FEB 2 5 2019

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

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

SECTION "B"
[6Q. × 4 = 24 marks]

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

1. What are the different ways of relief representation? Which is the most widely used method and why?

2. Why is horizontal equivalent not constant in a map unlike contour interval? Explain the characteristics of contours with neat sketches.

3. a. Calculate the area of the plan from the following readings of a planimeter:
Initial reading = 7.456
Final reading = 1.218
The zero of the disc passed the fixed index mark thrice in the clockwise direction. The anchor was placed outside the plan and the tracing point was moved in the clockwise direction. Take M = 100 cm^2

b. From a topographical map, the areas enclosed within the contour lines and along the face of a proposed dam are given below:

Contour (m)	300	295	290	285	280	275	270	265	260
Area (m^2)	29750	26850	21050	18500	13440	8750	5180	735	30

The bottom of the dam lies at 260 m. Calculate the volume of water in the reservoir formed, when the water level is at an elevation of 30 m, using:
i) Trapezoidal formula ii) Prismoidal formula

4. Define topographical surveying and state its importance. What factors would you consider while planning topographic survey of a particular area?

5. Explain how total station carries out the following functions:
a) Remote Elevation Measurement
b) Coordinate Measurement

6. Describe the method of adjusting a plane table traverse. Enumerate the advantages of plane table surveying.

7. Explain the basic principle of tacheometry. Derive an expression for the distance when the line of sight is horizontal and passes through optical center of the objective of an external focusing telescope.

SECTION "C"

[2Q. × 8 = 16 marks]

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

8. a. You are required to conduct topographical survey of your campus. Explain stepwise procedure that you would proceed to conduct the survey and prepare a topographical map. [5]
   b. Explain the methods of distance measurement in EDM. [3]

9. a. Following table represents observations made on two vertical staffs placed at A and B from a point P taken by means of a tacheometer fitted with an anallactic lens with instrument constant 100.

Instrument	At	Vertical angle	Stadia readings (m)	Bearing
P	A	+4° 18'	1.207, 0.808, 0.409	273°
P	B	-8° 04'	2.001, 1.910, 1.819	093°

   Find the gradient of line AB. [5]
   b. Derive the formula for distance and elevation in the tangential method. [3]

10. a. Describe the solution to three-point problem by Lehmann's Method. Enumerate the Lehmann's rules which are followed in estimating the position of the point sought. [5]
    b. Define the following terms: (i) Radiation (ii) Intersection (iii) Resection
    What are the basic differences between these methods? [3]