

MAR 30 2017

KATHMANDU UNIVERSITY  
End Semester Examination  
March/April, 2017

Marks Scored:

Level : B.E.  
Year : II

Course : GEOM 205  
Semester : I

Exam Roll No. : Time : 30 mins.

F. M. : 10

Registration No. :

Date :

SECTION "A"

[20 Q. × 0.5 = 10 marks]

Choose the best alternatives among the given choices:

1. Which technique/instrument is not used for topographic mapping?  
a. Photogrammetry      b. Remote Sensing      c. Tacheometer      d. EDM
2. The whole Nepal is covered by ..... topographical map sheet of 1:25000 and 1:50000.  
a. 705      b. 606      c. 706      d. 700
3. How many map sheets were required to cover whole Nepal in the map prepared by Survey of India in early 1930s?  
a. 29      b. 28      c. 36      d. 26
4. Which of the aerial survey data was used to compile the topographic map of Nepal?  
a. Aerial survey of 1972      b. Aerial survey of 1982  
c. Aerial survey of 1992      d. Aerial survey of 2002
5. If the area mapped is 10000 m<sup>2</sup> at scale 1:400 on a square paper of size 25 cm × 25 cm and if a cartographer wants to reduce the scale by 400%, what will be the area of paper required to represent the same area?  
a. 6.25 cm × 6.25 cm      b. 12.5 cm × 12.5 cm      c. 6.35 cm × 6.35 cm      d. 50 cm × 50 cm
6. Which one of the following is the optical technique of scale reduction and enlargement?  
a. Proportional Compass      b. Process Camera      c. Pantograph      d. Planimeter
7. Which one of the statement is untrue about Relief?  
a. Relief indicates the continuous variation in the nature of land surface and man-made features expressed as change in height and depth.  
b. Relief can be defined as difference in height between the highest and lowest land surface in a locality.  
c. Relief is perfectly and precisely represented on topographic maps.  
d. Relief includes shapes of hills, valley, streams and terrain features on the earth's surface.
8. The vertical difference between point A and B is 18 m, A is the lower elevation point than B. Also assume that the distance between A and B is 5 cm at scale. If the elevation of A is 607.4 m, what is the distance of 615 m contour point from A towards B?  
a. 2.11 cm      b. 2.21 cm      c. 1.11 cm      d. 1.21 cm

9. Generally for small scale work, which contour interpolation techniques is applied?  
 a. Estimation  
 b. Arithmetic calculations  
 c. Graphical  
 d. Rubber
10. In Simpson's formula, the number of ordinates must be  
 a. Odd  
 b. Even  
 c. Either odd or even  
 d. Even is favorable
11. The principle of stadia method was discovered in  
 a. 1880  
 b. 1780  
 c. 1870  
 d. 1770
12. The value of planimeter constant (C) is added only when  
 a. The anchor point is outside the figure  
 b. The anchor point is just on the boundary  
 c. The anchor point is anywhere  
 d. The anchor point is inside the figure
13. The methods used for locating the plane table stations are (i) radiation, (ii) traversing, (iii) intersection, (iv) resection. The correction answer is  
 a. (i) and (ii)  
 b. (ii) and (iv)  
 c. (iii) and (iv)  
 d. (i) and (iii)
14. Accurate centering in plane table survey is necessary for  
 a. Small scale maps  
 b. Large scale maps  
 c. Filling in details  
 d. To solve triangle of error rapidly
15. In stadia method, in order to make multiplying constant 100, the magnitude of angle of inclination should be  
 a. 34' 22"  
 b. 33' 22"  
 c. 68' 44"  
 d. 66' 44"
16. The instrument for subtense measurement should be accurate to  
 a. 5"  
 b. 2"  
 c. 1"  
 d. 0.5"
17. In the tacheometric equation,  $D = KS + C$ , K and C are multiplying constant and additive constant respectively. The other name for these constants are:  
 a. Instrument constant and telescopic constant  
 b. Telescopic constant and instrument constant  
 c. Stadia interval constant and stadia constant  
 d. Stadia constant and stadia interval constant
18. An alidade is used in plane table surveying for  
 a. Centering  
 b. Orientation  
 c. Drawing lines  
 d. None of the above
19. Prism constant is also known as  
 a. Instrument constant  
 b. Prism offset  
 c. Prism pressure constant  
 d. Prism reversal constant
20. For medium range (5 km – 25 km) distance measurement, which type of wave is used  
 a. Visible wave  
 b. Infrared  
 c. Microwave  
 d. Radio wave

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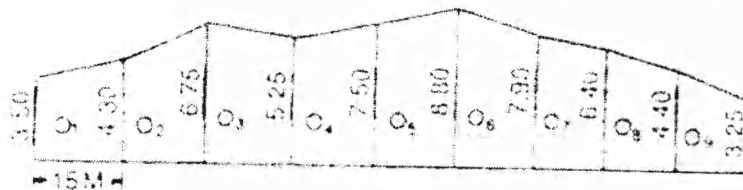
Course : GEOM 205  
Semester : I  
F. M. : 40

SECTION "B"

[6Q. × 4 = 24 marks]

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

1. Define topographical surveying and topographical map. Why do you think topographical surveying is important?
2. List the advantages and disadvantages of tacheometric surveying over direct measurements. What are the essential characteristics of tacheometer?
3. a. State the principle of plane table surveying. What are the qualities of good plane table?  
b. Define strength of Figure. Illustrate with figure/diagram, how the position of plane table affects the strength of Figure.
4. Define contour. List any six important characteristics of contour with neat and clean figures.
5. What is contour interval and horizontal equivalent? What are the factors in which contour interval depend?
6. Define map generalization. Why map generalization is scale related and partly subjective? Differentiate between the types of generalization.
7. What are the different ways of relief representation? Why is relief representation noise in a map?
8. a. The following offsets were taken at 15 m intervals from a survey line to an irregular boundary line: 3.50, 4.30, 6.75, 5.25, 7.50, 8.80, 7.90, 6.40, 4.40, 3.25 m. Calculate the area enclosed between the survey line, the irregular boundary line and the offsets, by a) the trapezoidal rule and b) Simpson's rule.



- b. A reservoir is proposed for construction at some particular location. The table shows areas of contours obstructed by the reservoir.

Contour (m)	2150	2160	2170	2180	2190	2200	2210	2220
Area (m <sup>2</sup> )	700	870	1020	1480	2470	4020	5970	7830

If the base of dam is at RL of 2150 m and its height is 70 m, find the volume of water stored in it using: (a) Trapezoidal Rule and (b) Simpson's Rule.

SECTION "C"  
[2Q. × 8 = 16 marks]

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

9. a. Suppose you are selected to prepare topographic map of your district at scale of 1:25000. Describe the procedure you will follow to prepare the topographic map that will be used for future planning and development of your district. [5]  
b. Describe the different functions of total stations. [3]
10. a. Derive the equation of distance and elevation for staff normal in tacheometric surveying. [4]  
b. Determine the gradient from a point A to a point B from the following observations made with a tacheometer fitted with an anallactic lens. The constant of the instrument was 100 and the staff was held vertically. [4]

Inst. Station	Staff Point	Bearing	Vertical Angle	Staff Reading
P	A	134°	+ 10° 32'	1.360, 1.915, 2.470
	B	224°	+ 5° 6'	1.065, 1.885, 2.705

11. a. Describe the Bessel's method of three point problem. [4]  
b. What are the possible sources of errors in plane table surveying? What steps can be taken to minimize those errors? [4]