SOE.

KATHMANDU UNIVERSITY
End Semester Examination
March, 2024

Marks Scored:

Level : B.E.
Year : II

Course : GEOM 201
Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date 25 MAR 2025

SECTION "A"
[20Q. × 0.5 = 10 marks]

Choose the most appropriate answer. Symbols have their usual meanings.

1. What is the least count of a vernier theodolite?
   a. 1 minute b. 10 seconds c. 20 seconds d. 5 seconds

2. In angular measurement, what is the term for the process of aligning the instrument with a reference direction?
   a. Centering b. Sighting c. Orienting d. Focusing

3. Which error occurs due to the sag of the tape while measuring distances?
   a. Instrumental error b. Natural error c. Personal error d. Systematic error

4. What is the primary use of a contour line on a topographic map?
   a. To show elevation changes b. To indicate property boundaries
   c. To mark roads d. To show water bodies

5. The magnetic bearing of a survey line at any place
   a. Remains constant
   b. Changes systematically
   c. Varies differently in different months of the year
   d. Always greater than true bearing

6. A contour line that forms a sharp curve and points toward lower elevation indicates a
   a. Ridge b. Cliff c. Valley d. plain

7. Choose the **correct** statement.
   a. The graduations (figures) are inverted in a surveyor compass.
   b. A prism in a prismatic compass is provided to magnify the graduations in addition to erecting the figures.
   c. East and west are interchanged in prismatic compass.
   d. The 0° graduation is placed at north in prismatic compass.

8. Which one of the following statements is **correct**?
   a. The axis of plate level should be parallel to the vertical axis.
   b. The axis of striding level must be parallel to the horizontal axis.
   c. The axis of the altitude level must be perpendicular to the line of collimation.
   d. The line of collimation must be perpendicular to the plate level axis.

9. Which of the following errors in surveying can be eliminated by proper instrument adjustment?
   a. Systematic errors b. Personal errors c. Accidental errors d. Random errors

10. In plane surveying, the curvature of the Earth is:
   a. Always considered b. Partially considered
   c. Neglected d. Only considered for very large projects

Fill in the blanks with appropriate answer.

11. N 49°12' W is equal to _____ in WCB.

12. The scale of a map is 1:5000, then 1 cm on map equals _____ in ground.

13. A line which passes through the optical center of the objective and also through the intersection of the cross hair is called _____.

14. The sum of the exterior angles of a closed traverse with 'n' sides is given by _____.

15. A freely suspended plumb bob indicates _____.

16. The difference in angle between true bearing and the magnetic bearing at a particular location is called _____.

17. A 50 m tape is 2m out of line. The true length is _____.

18. One hectare of an area is equivalent to_____ Km^2.

19. Graduated ring is attached with needle in _____ Compass.

20. Area of a circle having radius 35 meters is _____ ropani.

SOE.

25 MAR 2025

KATHMANDU UNIVERSITY
End Semester Examination
March, 2024

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

Course : GEOM 201
Semester : I
F. M. : 40

SECTION "B"

Attempt *ALL* questions. Assume the suitable value if necessary.

1. Discuss about the principles of surveying with relevant examples. Calculate the area of the triangular field having length of sides a = 100m, b = 120m, c = 85m in ropani system. [3+2=5]

2. Define tacheometric surveying and its principle. Explain how can you determine tacheometric constants for any tacheometer. List the code of the signals used by surveyor and its meaning to the assistant. [1+2+2=5]

3. How can the error due to tension can be corrected while taking linear measurement using tape. A base line measured with a steel tape gives an approximate length of 1000 m. Compute the correct length of the base line at mean sea level when the pull at the standardization equals 15 kg. The applied pull is 23 kg. The cross-sectional area of tape is 0.0645 cm^2 and E= 2.11 x 106 kg/cm^2. Temperature T_m and T_o are 35°C and 15°C, respectively. The coefficient of thermal expansion of the material of the tape per °C is 11.5 x 10^{-6}. The difference in level of the two ends of base line is 2m. R = 6400 km. Elevation of base line above mean sea level = 1000 m. [2+4=6]

4. How can we resolve the problem arise due to shrinkage of a map. [3]

5. List out the works that can be carried out using theodolite. Can you prolong a straight line using a theodolite? If yes, explain with figure. [1+2=3]

6. Explain the term "Field book" used in Chain Surveying. A river is flowing from west to east. For determining the width of the river, two points A and B are selected on the southern bank such that distance AB = 100 m. Point A is westwards. The bearings at a tree C on the northern bank are observed to be 40° and 340°, respectively from A and B. Calculate the width of the river. [2+3=5]

7. Explain about the magnetic declination and its variations in compass surveying. The following fore bearings and back bearings were observed in traversing with the compass.

Traverse legs	Fore bearing	Back bearing
AB	S 11^0 30' W	N13^0 00'E
BC	N 69^0 30' E	S 66^0 30' W
CD	N 32^0 15' E	S 30^0 30' W
DE	S 82^0 45' W	N 80^0 45' E
EA	S 50^0 15' W	N 53^0 00' E

Determine which stations are suffering from local attraction and correct the bearings. [2+4=6]

P.T.O.

8. Derive the expression for Simpson's One -Third rule to calculate the area. Why this method is more accurate. Also mention its applicability case. [3+1=4]

9. Compute the area of the given figure using coordinate method. [3]