

KATHMANDU UNIVERSITY  
End Semester Examination [C]  
December, 2024

Marks Scored:

Level : B.E.

Year : III

Exam Roll No. :

Registration No.:

Time: 30 mins.

Course : GEOM 303

Semester : I

F. M. : 10

Date 23 DEC 2024

SECTION "A"

[20 Q. × 0.5 = 10 marks]

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

1. What is the primary purpose of surveying in construction?
  - a. To determine property lines
  - b. To map underground utilities
  - c. To determine the relative positions of points on the Earth's surface
  - d. To calculate material costs
2. Invert is defined as
  - a. the R.L. of the inverted pipeline
  - b. the R.L. of the top of the sewer
  - c. the R.L. of the bottom of the inner surface of sewer or pipe
  - d. the R.L. determined with staff inverted
3. In hydrography
  - a. Only horizontal control is required
  - b. Only vertical control is required
  - c. Both horizontal and vertical control is required
  - d. no such control point is required
4. The radius of a simple circular curve is 30 m and the length of the specified chord is 30 m. The degree of the curve is
  - a. 37.03
  - b. 60
  - c. 55.60
  - d. 57.29
5. The major tide producing force is due to
  - a. Sun
  - b. Venus
  - c. Moon
  - d. Mars
6. The length of boning rod for a section of the sewer is
  - a. Changed at every section
  - b. Changed frequently
  - c. Changed at the alternate intermediate sections
  - d. kept constant
7. For high accuracy, the staff must be held \_\_\_\_\_ to the line of sight in tacheometric surveying.
  - a. Vertical
  - b. Horizontal
  - c. Both vertical and horizontal
  - d. Inclined
8. The angle of intersection of a curve is the angle between the
  - a. back tangent and forward tangent
  - b. back tangent and sub chord
  - c. forward tangent and long cord
  - d. back tangent and long cord

9. The arc definition for degree of curve is practiced in  
a. Railways      b. Highways      c. Tunnels      d. Canal alignment
10. The standard accuracy of tacheometric distance determination is  
a. 1:10      b. 1:100      c. 1:1000      d. 1:500

**Fill in the blanks with appropriate answer.**

11. When an upgrade is followed by downgrade, the curve is \_\_\_\_\_.
12. Elevation of outer edge of road is raised above the inner one is called \_\_\_\_\_.
13. \_\_\_\_\_ (instrument) is used for measuring the area of irregular boundary.
14. When the length of any chord of a curve is less than peg interval it is known as \_\_\_\_\_.
15. In construction, a \_\_\_\_\_ is used to transfer points vertically between two levels.
16. The connection between the channel and the penstock is \_\_\_\_\_.
17. The flow rate of a river is typically measured in \_\_\_\_\_.
18. Offsets from the tangents to the curve are proportional to the \_\_\_\_\_ of their distances from the first tangent point.
19. The distance between intersecting point and mid-point of simple circular point is \_\_\_\_\_.
20. In the stadia formula,  $D=K*S+C$ , K is known as the \_\_\_\_\_.

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Time : 2 hrs. 30mins.

23 DEC 2024

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Semester : I  
F. M. : 40

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SECTION "B"  
[40 marks]

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

1. Define surveying and explain its importance in engineering and construction. [1+2]
2. Briefly explain the operations involved in route surveying. [3]
3. List out the applications of hydrographic survey. Explain the various method to determine the discharge of a river. [2+2]
4. Define mine surveying. How can you differentiate the underground survey with surface surveying? [1+2]
5. Explain the importance of topographic surveys in planning hydropower projects. [4]
6. The center-line of two straights is projected forward to meet at I, the deflection angle being  $30^\circ$ . If the straights are to be connected by a circular curve of radius 200 m, tabulate all the setting-out data, assuming 20-m chords on a through chainage basis, the chainage of I being 2259.59 m. [5]
7. What is superelevation? Explain its role in balancing centrifugal forces on horizontal curves. [1+3]
8. Describe the procedure to be followed for setting out of tunnel with suitable figure. [5]
9. What is tacheometry? Derive the expression for distance and elevation formulae for inclined sight while staff is placed vertical. [1+4]
10. What is a vertical curve? Explain the differences between summit and valley curves. [1+3]

