

KATHMANDU UNIVERSITY
End Semester Examination
March/April, 2017

Marks Scored:

Level : B.E.

Year : III

Exam Roll No. :

Time: 30 mins

Course : GEOM 303

Semester : I

F. M. : 10

Registration No.:

Date APR 6 2017

SECTION "A"

[20 Q. × 0.5 = 10 marks]

Choose the best alternatives among the given choices.

1. Which one of the following is NOT the stage of project cycle?
 - a. Ex-Post Evaluation
 - b. Project Identification
 - c. Project Skimming
 - d. Feasibility and Financing
2. Which of the following approach can be used to plot x-section in route survey?
 - a. Change in slope approach
 - b. Coordinate approach
 - c. Distance and elevation approach
 - d. Interpolation approach
3. Which surveying operation is NOT done in construction survey?
 - a. Detail topographic survey
 - b. Checking benchmark and running center line level
 - c. Setting slope and grade stakes
 - d. Setting out curves
4. The information included in hydrographic survey are _____.
 - a. Rates of flow, areas, levels, volumes, distance, angle
 - b. Rates of flow, areas, levels, volumes, the characteristics of underwater surface
 - c. Rates of flow and volume
 - d. Rates of flow, areas and volumes
5. The length and diameter of the sounding rod is _____ respectively.
 - a. 5 – 8m and 5 – 10cm
 - b. 5 – 8m and 5 – 15cm
 - c. 5 – 10m and 5 – 10cm
 - d. 5 – 10m and 5 – 15cm
6. While measuring the discharge of rectangular weir, head (H) should be measured at a distance of _____.
 - a. 2H to 3H downstream of the weir
 - b. 2H to 3H upstream of the weir
 - c. 3H to 5H downstream of the weir
 - d. 3H to 5H upstream of the weir
7. Penstocks for hydroelectric installations are normally equipped with _____.
 - a. Gate system and surge tank
 - b. Gate system
 - c. Surge tank
 - d. Metal or concrete
8. The slope of penstock is generally kept at _____.
 - a. 30 degree
 - b. 45 degree
 - c. 60 degree
 - d. 75 degree
9. A road inside a mine is called _____.
 - a. Vein
 - b. Adit
 - c. Drift
 - d. Gangway

10. Gyroscope is used to determine _____.
- a. any direction b. Grid North c. True North d. Magnetic North
11. A marker is set in the plug which represents the exact station. It is known as _____.
- a. Control point b. Extended control point
c. Temporary control point d. Spad
12. Distance between the point of intersection and apex of the curve is known as _____.
- a. mid ordinate distance b. external distance
c. long chord distance d. normal distance
13. The curve that is transitional throughout is known as _____.
- a. Bernoulli's lemniscate curve b. Lemniscate curve
c. Simple curve d. Compound curve
14. Which of the following curve is introduced if a milder downgrade is followed by a steeper downgrade?
- a. Convexity upward b. Convexity downward
c. Valley d. Sag
15. The most commonly used planimeter is _____.
- a. Polar planimeter b. Amsler planimeter c. Drum planimeter d. Normal planimeter
16. The vertical structure to support deck slab in between the edges is called _____.
- a. Abutment b. Railing c. Bearing d. Pier
17. According to international rule, bridge over the water way of 6 – 30 m is called _____.
- a. Major bridge b. Large bridge c. Minor bridge d. Small bridge
18. The instrument for subtense measurement should be accurate to _____.
- a. 5" b. 2" c. 1" d. 0.5"
19. In mass haul diagram, abscissa represents _____.
- a. Cumulative volume b. Haulage cost
c. Distance d. Time
20. In tangential system of measurement, the formula for horizontal distance (H) when both θ_1 and θ_2 are angles of elevation is (where symbols have their usual meaning) _____.
- a. $\frac{S}{\tan \theta_1 - \tan \theta_2}$
b. $\frac{100S}{\tan \theta_1 - \tan \theta_2}$
c. $\frac{S}{\tan \theta_1 + \tan \theta_2}$
d. $\frac{S}{\tan \theta_2 - \tan \theta_1}$

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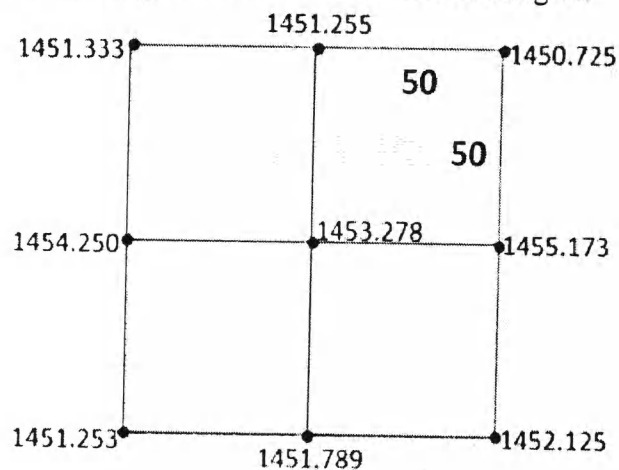
Level : B.E.
Year : III
Time : 2 hrs. 30 mins.

Course : GEOM 303
Semester : I
F. M. : 40

SECTION "B"
[6Q. × 4 = 24 marks]

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

1. Define hydrographic surveying. Why hydrographic surveying is required?
2. What is stream gauging? What are the different methods of stream gauging? Briefly explain them.
3. Define mass haul diagram. List the characteristics of mass haul diagram with figure.
4. Why are vertical curves generally parabolic? Derive the equation of vertical curve.
5. List the different methods of setting out horizontal curves. Write short notes on Rankine method for setting out circular curve.
6. Two straight lines intersect at chainage 4325.50m, and the angle of deflection is 75° . If the radius of the curve is 750m, determine:
 - a. Tangent distance
 - b. Length of the curve
 - c. Chainages of points of curvature and tangency
 - d. Length of the long chord
 - e. Degree of curve
 - f. Apex distance and the mid ordinate
7. A surveyor surveyed a project site in a grid pattern where the spacing between the adjacent surveyed points was 50m as shown in the figure below. The elevations of the surveyed points (in meter) are given next to the corners of the grid.



For the construction of building, the site needs to be levelled to 1450.000m. Calculate the volume of cut.

SECTION "C"
[2Q. × 8 = 16 marks]

Attempt *ALL* questions. Assume suitable data if necessary.

8. Suppose a new road is required to connect Kathmandu, Godawari, Panauti, Bhakunde, Mangaltar and Janakpur. Suppose you are hired as a Geomatics Engineer for overall survey activities from planning to construction supervision. Describe the overall steps, stating the points to be considered in each step. [8]
9. a. Define underground surveying. Differentiate between surface surveying and underground surveying. [5]
- b. Let **A** (5000m, 3000m, 1450m) and **B** (5000m, 3050m, 1460m) are two stations inside the tunnel. The point **A** is occupied by an instrument and after referencing with respect to some direction, the angle between that referenced line and the line **AB** was found to be 30° . A surveyor wants to extend one new control point, **C** on the roof of the tunnel which was 30m far from **A** (slope distance). A plumb bob was hung from **C** and cross hair of instrument bisected at a point in the rope which was 1.5m below **C** with 45° and 90° , as the observed value in vertical and horizontal scale of the instrument respectively. Assuming height of the instrument as 1.5 m, find the control value of **C**. [3]