KATHMANDU UNIVERSITY
End Semester Examination [C]
June, 2018

Marks Scored:

Level : B.E.
Year : III

Course : GEOM 303
Semester: I

Exam Roll No.:

Time: 30 mins

F.M. : 10

Registration No:

Date : JUN 10 2018

SECTION "A"
[20 Q.× 0.5 = 10 marks]

Choose the most appropriate alternatives among the given choices:

1. For abutment layout of bridge, the surveyor checks the layout
   a. Before the excavation and before concrete is poured.
   b. Before the excavation and after concrete is poured.
   c. After the excavation and after concrete is poured.
   d. After the excavation and before concrete is poured.

2. Free haul distance is
   a. The length of a balancing line
   b. The distance between two balancing lines
   c. The distance between two successive points where the mass haul diagram intersects the line of zero ordinate
   d. The distance up to which carting of excavated material is done without extra payment.

3. According to international rule, the bridge over the water way of 6 – 30 meter is called
   a. Major Bridge
   b. Large Bridge
   c. Minor Bridge
   d. Small Bridge

4. A minimum ordinate on a mass haul diagram occurs
   a. At the end of a cut and embankment
   b. At the end of an embankment
   c. Where cut and fill are balanced
   d. Where fill and cut are unbalanced.

5. Which survey operation is not done in construction surveying?
   a. Detail topographic surveying
   b. Checking benchmark and running center line
   c. Setting slope and grade stakes
   d. Setting out curves

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. Which of the following approach can be used to plot x-section in route surveying?
   a. Distance and elevation approach
   b. Change in slope approach
   c. Coordinate approach
   d. Interpolation approach

8. A mass haul diagram indicates cutting if the curve _____.
   a. Becomes horizontal in both cases
   b. Becomes vertical in both cases
   c. Rises
   d. Falls and Rises

9. Which of the following method states "Area is equal to product of common interval 'd' and sum of intermediate ordinates plus average of first and last ordinates"?
   a. Trapezoidal Method
   b. Simpson's Method
   c. Average Ordinate Method
   d. Mid Ordinate Method

10. 1 acre is equal to
   a. Both 'b' and 'd'
   b. 0.4047 hectare
   c. 40.47 m^2
   d. 10-15-1-0

11. Which of the following represents the highest and lowest point on vertical curve?
   a. $\left(\frac{g_1-g_2}{2L}\right)$ b. $\left(\frac{g_2-g_1}{2L}\right)$ c. $\left(\frac{g_2L}{g_1-g_2}\right)$ d. $\left(\frac{g_1L}{g_1-g_2}\right)$

12. The long chord and tangent length of a circular curve of radius R will be equal if the angle of deflection is:
   a. 150^0 b. 120^0 c. 60^0 d. 30^0

13. The storage reservoir located near the beginning of the penstock to receive the rejected flow when the pipeline is suddenly closed by valve fitted at its steep end is:
   a. Surge Tank b. Draft Tube c. Trash Racks d. Penstock

14. What will be the volume of earthwork in an embankment for which the cross sectional areas at 20 m interval are as follows:

Distance	*0*	*20*	*40*	*60*	*80*	*100*	*120*
C/S Area (m^2)	38	62	74	18	22	28	13

a. $2612.80m^3$ b. $2647.73\ m^3$ c. $2238.5m^3$ d. $4500m^3$

15. The line on the ground along which the change in gradient is best suited for canal is
a. Slope contour
b. Isobaths
c. Grade contour
d. Depth contours

16. Co-planing in mine surveying is a process of
a. Bringing points in same horizontal plane
b. Establishing points in a vertical plane at different levels
c. Centering the instrument over the ground station mark
d. Transferring the surface alignment underground through a narrow shaft

17. Which relationship is true about the degree of curve if one assumes standard arc of length 20 meter?
a. $D_a = \frac{1718.87}{R}$
b. $D_a = \frac{1145.92}{R}$
c. $D_a = \frac{1192.45}{R}$
d. $D_a = \frac{1787.18}{R}$

18. What is the standard of minimum ground clearance in meters for 220kV transmission line according to Nepal Electric Authority (NEA)?
a. 25
b. 7.5
c. 4.58
d. 5.49

19. The range of deflection angle while selecting angle point during transmission line survey is:
a. 0^0 - $56^0 14'$
b. Greater than 56^0
c. 30^0 - 120^0
d. 0^0 - 56^0

20. To fix a map point in the ground:
a. Angle and distance is essential
b. Angle is essential
c. Distance is essential
d. Traversing is essential

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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. Derive an expression for the area of a side hill two level section with the help of a neat sketch. *The level section must include both cutting and filling.* [3+1]

2. Define setting out. Mention different survey instruments used in stake out surveying? Briefly explain how total station has revolutionized the stake out survey? Explain with an example. [1+1+2]

3. What are the points to be considered while planning the best route? Explain about longitudinal and cross section survey of any route. Which approach of cross section is more accurate equal interval or the slope change approach and why? [1+2+1]

4. Mention the main differences between the surface and underground surveying. Explain shaft and adit with clear diagram. [2+2]

5. Define Angle point. Briefly explain on control point establishment and various factors that are needed to be considered in transmission line surveying. [1+3]

6. Define Mass Haul Diagram with a well labelled sketch. Mention the various characteristics of mass haul diagram. [2+2]

7. Explain why hydrographic survey is conducted? Briefly explain how the provisions of both horizontal and vertical control points are made in hydrographic surveying? [2+2]

8. What would be the effect on canal if the velocity of water in canal surpasses maximum permissible velocity and remains less than minimum permissible velocity? How canal alignments are fixed? *Talk about the method and function available in total station used for this purpose.* [2+2]

SECTION "C"

[2Q. × 8 = 16 marks]

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

9. Why is it necessary to compute the area of a tract of land? Why the area obtained from different methods are always different?

A tract of land has three straight boundaries AB, BC and CD. The fourth boundary DA is irregular. The measured lengths are as under:

AB = 135m, BC = 191m, CD = 126m and BD = 255m.

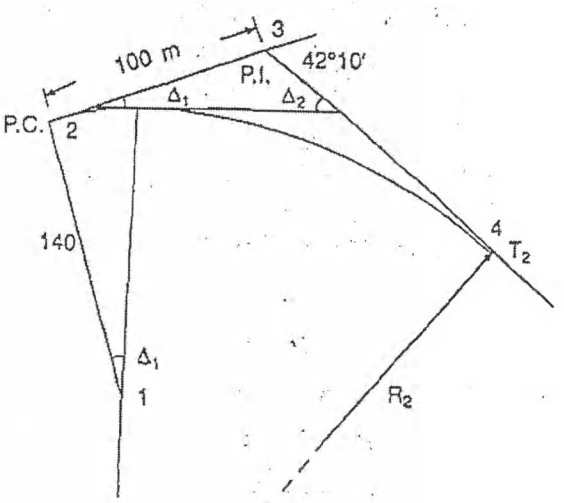
The offsets measured outside the boundary DA to the irregular boundary at a regular interval of 30m from D, are as below:

DISTANCE FROM D (M)	**0.0**	**30**	**60**	**90**	**120**	**150**	**180**
OFFSETS (M)	0.0	3.7	4.9	4.2	2.8	3.6	0.0

Determine the area of tract in hectare. [3+5]

10. Supplementing with neat sketches differentiate between simple compound and reverse curves.

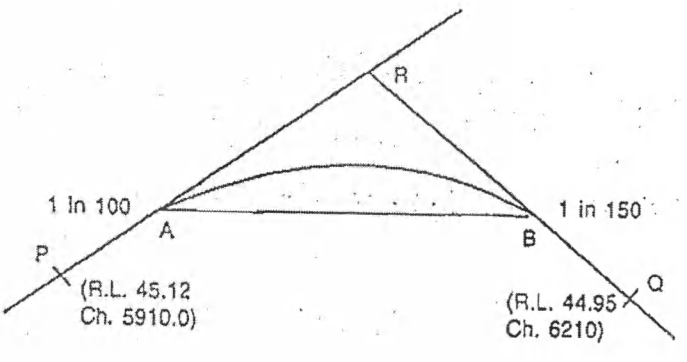
Referring to the figure, T_1=100m, R_1=140m, Δ_1=18°15′, Δ = 42°10′ and the chainage of the point of intersection is at station 50 + 19.70. Using the arc definition of degree of curve, computeT_2, R_2 and Δ_2 and the chainage of the point of compound curvature and the point of tangency. Assume 30 m chain.



[3+5]

11. What is meant by rate of change of grade on vertical curves and why is it important?

On a straight portion of a new road an upward gradient of 1 in 100 was connected to a downward gradient of 1 in 150 by a vertical parabola. Summit curve of length 150m. A point P, at chainage 5910.0 m, on the first gradient, was found to have a reduced level of 45.12m, R is at chainage of 6019.8 m and point Q at a chainage of 6210.0 m on the second gradient of 44.95 m. *Find the chainage and reduced level of tangent points, tabulate the reduced levels of the points on the curve at intervals of 20m from P and of its highest point.*



[2+6]

KATHMANDU UNIVERSITY

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RE-SCHEDULED

May 30, 2018

NOTICE

End-Semester Compartmental Examinations of B.E.\B.Sc.\B.Pharm.\B.Tech.\B.Arch. students will be held according to the following schedule.

Date	Day	Courses
June 10, 2018	Sunday	MATH 101, MATH 111, EEEG 207, COMP 202, BIOT 302, COMP 342, PHAR 301, PHAR 402, COMP 407, ARCH 111, CHEG 311, MEEG 301, GEOM 303, COMP 314, MEPP 403
June 11, 2018	Monday	EEEG 213, MEEG 213, MCSC 201, MATH 205, PHYS 405, PHAR 216, MGTS 403, GEOM 402, PHAR 408, COMP 409, CIEG 204, MATH 322
June 12, 2018	Tuesday	PHYS 101, CIEG 203, BIOT 204, MGTS 301, PHYS 302, BIOT 406, BIOT 409, BIOT 410, ARCH 101, CHEG 302, COMP 316
June 13, 2018	Wednesday	MATH 207, PHAR 203, PHAR 404, BIOT 401, COMP 472, PHYS 401, ENVS 404, CIEG 304
June 14, 2018	Thursday	COMP 103, COMP 101, CHEM 201, COEG 304, INAN 301, PHYS 303, EPEG 422 , GEOM 411, CHEG 303, COMP 323 ENVS-207
June 15, 2018	Friday	EEEG 202, EEEG 204, CIEG 201, BIOT 202, GEOM 202, EPEG 302, COMP 317, MEPP 412, PHAR 406, MATH 303, ENVE 204, MGTS 402, COMP 301 CHEM-207, ENVS-212,
June 17, 2018	Sunday	ENGG 111, BIOL 101, COMP 231, PHAR 204, GEOM 316, MATH 208, PHAR 304, CIEG 305, COMP 478, COMP 484, PHYS 402, STAT 201
June 18, 2018	Monday	EEEG 211, EEEG 313, MEEG 216, BIOT 205, MEEG 315, COMP 315, CIEG 401, MATH 206, COEG 401, MATH 201, PHYS 201, ENVS-415
June 19, 2018	Tuesday	CHEM 101, MEEG 219, EEEG 314, MEEG 306, CIEG 301, PHAR 303, PHYS 404, ENVE 433, COMP 307, CIEG 402, CIEG 403, MCSC 202, PHYS 203 PHYS-206, ENVS-435

Examination Time : 11.00 A.M. to 2.00 P.M.
Venue : Kathmandu University, Dhulikhel.

Prof. Panna Thapa, Ph. D.
Controller of Examinations