

Time: Three hours

Full Marks : 100

*Different parts of the same question should be answered together.***PART - I**

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|-------------|---|
| CO1
[5] | <p>Answer any two from this block</p> <p>[1] (a) State the principle of surveying.
(b) Why not "part to whole" Explain.
© What are the types of surveying? What are the primary divisions of surveying?
[2.5+2.5]</p> |
| CO2
[10] | <p>[2] Answer any two from this block</p> <p>(a) Explain the different method of ranging with neat sketch. What are the accessories for a chain survey? Explain the functions of each. What are the different tape corrections, their values and signs for length measurements?</p> <p>(b) Find the normal tension for tape 30m long if the calibrating pull was 100N. The weight of the tape was 15 N, its area of cross section was 4 mm^2, and $E = 200\text{GN/m}^2$.</p> <p>(c) In order to find the width of a river, two point A and B were taken on one bank so that AB is approximately parallel to the river. A well defined point C on the other side was marked. With an adjustable cross staff, angle $BAC = 40^\circ$ and $ABC = 55^\circ$ were measured. Find the width of the river if $AB = 200\text{m}$. [5+5]</p> |
| CO4
[35] | <p><u>Answer question no (a) and any two from (b), (c) and (d) in this block:</u></p> <p>[3]</p> <p>a. (i) Distinguish between closed traverse and open traverse. (ii) Explain the characteristics of Contour lines.</p> <p>b. (i) Explain the characteristics of contours. (ii) The following consecutive readings were taken with a level and 5 meter leveling staff a continuously sloping ground at a common interval of 30 meters. 0.385 ; 1.030 ; 1.925 ; 2.825 ; 3.730 ; 4.685 ; 0.625 ; 2.005 ; 3.1101 ; 4.485 the R.L of the first point was 300.00 m. Rule out a page of level book and enter the readings. Calculate the R.LS of the points by rise and fall or HI method also the gradient of the line joining the first and last point.</p> <p>c. (i) Write about the various elements of a simple circular curve.(ii) Explain the method of setting out a simple and transition curve by two theodolites. OR
From the given data calculate only the deflection angles of the only Transition curve for setting out purpose with NECESSARY CHECKS? Minimum peg interval = 2.0 m Velocity = 60km/hr, Radius = 260m α = rate of change of radial acceleration = 1.05m/sec^3 Meter age at intersection point = 5000m l=Intersection angle = $38^\circ 34' 30''$.</p> |

d. Prepare Gale's traverse table using the data of the closed traverse given below, after checking and balancing the traverse. The bearing of line AB observed was $222^{\circ}01'30''$.

Line	AB	BC	CD	DA
Length	155.25	170.4	202.6	139.4
Station	A	B	C	D
Included angle	$101^{\circ}39'30''$	$95^{\circ}32'50''$	$75^{\circ}15'30''$	$87^{\circ}32'50''$

[5+15+15]

Course objectives:

CO1: To recognise the importance of surveying in the field of civil engineering. (K1)

CO2: To associate the basics of linear/angular measurement methods like chain surveying, compass surveying and describe spherical trigonometry and geodetic surveying. (K2)

CO3: To explain the significance of plane table surveying in plan making. (K2)

CO4: To apply the basics of levelling, theodolite and tachometric surveying in elevation and angular measurements and setting out methodology of different types of curves; to apply principles of triangulation and trilateration. (K3)

B. Construction Engg. 2nd Yr ~~1st~~ Semester Exam. 2018

Surveying

PART - II

Answer Q.no.1 and any two from the rest.

1. (CO2 & CO4)

(A) Choose the correct answer from the following questions:

1 x 5

(a) Two-point and three-point problems are methods of

- (i) Traversing (ii) Resection only (iii) Resection and orientation
(iv) Orientation only.

(b) The angle of dip at the equator is

- (i) 0° (ii) 90° (iii) 45° (iv) none of the above

(c) The graduations in a prismatic compass

- (i) are inverted (ii) have zero at south (iii) are from 0° to 360° (iv) all the above.

(d) The quadrantal bearing of a line is determined by a

- (i) Prismatic compass (ii) Surveyor's compass (iii) Celestial observations (iv) None of the above.

(e) Napier's rule is applicable for following triangles only

- (i) Obtuse angled (ii) Right angled (iii) Acute angled (iv) None of the above.

(B) Write short notes on the following:

1 x 5

- (i) Bowditch's rule
(ii) Compass traverse
(iii) Isogonic and agonic lines
(iv) Alidade
(v) Geodetic survey

2. (CO2) (a) State and explain the log sine condition or side condition.

(b) Two points A and B on the earth's surface are on the same meridian, A, being on the equator and B on the latitude of 25° N. A great circle BC meets the equator at C on the west of A and the angle ABC is 35° . Calculate the shortest distance AD on the great circle BC and the angle BAD. Also determine the spherical excess of the triangle ABD. Assume $R = 6378$ km.

2 + 18

3. (CO3) (a) Explain the principle of plane table surveying.

(b) Mention the various methods of plane table traverse. Explain any one of them giving neat sketch.

(c) Illustrate any one method of resection with neat sketch.

3 + 7 + 10

4. (CO2 & CO4) (a) What are the necessary & sufficient conditions for a closed polygon with a central station?

(b) What is a satellite station? Explain the various cases.

(c) In a braced quadrilateral PQRS, the angles determined after first two corrections (i.e., sum of angles and base angles) are as follows:

Name of angle	Value
TPR	61°21'53"
TRP	38°09'59"
TQS	80°22'57"
TSQ	19°08'55"
TQR	54°55'40"
TRQ	25°32'28"
TPS	58°10'25"
TSP	22°17'43"

Apply the log sine and shift corrections. Tabulate the final corrected values of all the angles and apply checks.

2 + 3 + 15

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