

B.E. Civil Engineering (2nd YEAR 2nd SEMESTER EXAMINATION), 2022(1st / 2nd Semester / Repeat / Supplementary / Annual / -Biannual)**SUBJECT: SURVEYING-II**

Full Marks: 100

Time: Two hours/Three hours/Four hours/ Six hours

(30 marks for this part)

Use a separate Answer-Script for each part

Question No.	Part-I	Marks
	Answer Question-1 and any two questions from the rest	
Q.1) A)	<p>Fill in the blanks with appropriate word(s):</p> <p>a) The distance between the vertex and the apex of a simple curve is called ----- -----.</p> <p>b) The ratio between the centrifugal force and the weight of a vehicle is called -----</p> <p>c) The tangential angle of the long chord is called -----</p> <p>d) ----- is called "Ideal Transition Curve".</p> <p>e) The maximum super-elevation recommended under extra-ordinary condition for broad gauge railway track is ----- mm.</p> <p>f) In small-scale hydrographic survey primary horizontal control is usually established by virtue of -----</p>	1*6=6
Q.2)	<p>a) Establish the fundamental concept behind computing the deflection angle for nth peg on a simple circular curve in "Double Theodolite Method" of setting out of simple curve.</p>	5
	<p>b) Two straights AM and BM meet at a chainage of 3450m. A right-handed simple circular curve of 250m radius joins them. The deflection angle between the two straights is 50°. Tabulate the necessary data to layout the curve by Rankine's method. Consider suitable chord interval.</p>	7
Q.3)	<p>a) "Shift of the circular curve bisects the transition curve and vice-versa"- prove it.</p>	5

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Question No.	Part-I	Marks
	b) While designing a bridge an ascending gradient (+0.74%) is found to meet a descending gradient (- 0.57%). The chainage and the reduced level at the point of intersection are 436m and 303.52m respectively. Calculate the reduced levels (RLs) of various station pegs on a vertical curve. Consider the rate of change of grade as 0.12% per 30m.	7
Q.4)	a) Discuss with the help of a neat sketch on the "Two theodolite method" of locating sounding stations.	4
	b) An observer taking soundings from a boat (O) wished to locate his position and measured with a sextant the angles subtended at (O) by three points A, B and C on the shore. The length AB and BC were scaled from the map and found to be 207m and 242m respectively and the angle $\angle ABC$ was $127^{\circ}48'$. The observed angles $\angle AOB$ and $\angle BOC$ were $31^{\circ}52'$ and $43^{\circ}37'$ respectively. What are the distances of (O) from A, B and C?	8

B.E. CIVIL ENGINEERING SECOND YEAR SECOND SEMESTER EXAM 2022**SUB: SURVEYING II**

Time: 3 hours

Full Marks: 100

Use separate answer scripts for each part

Part-II**[Answer Question No.1 and any five from the rest]**

Full Marks: 35

[1 x 5 + 5 x 6 = 35]

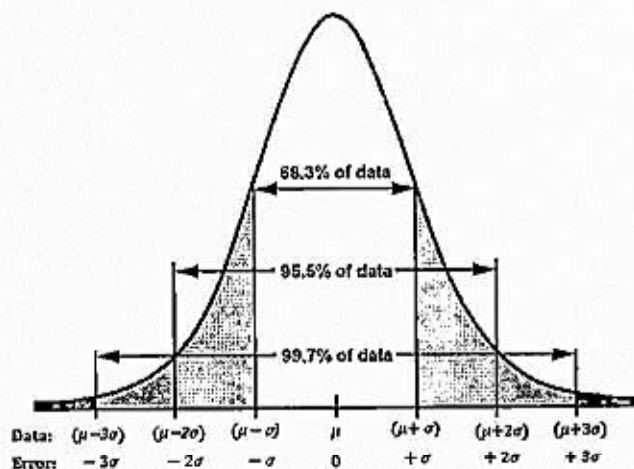
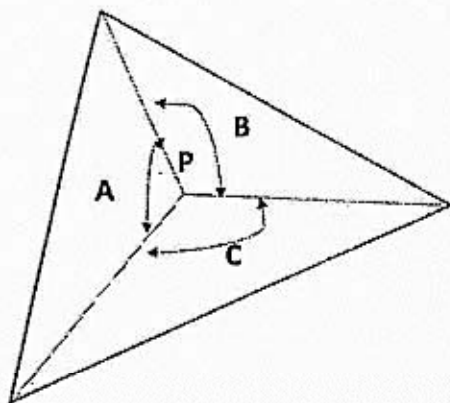
1) In a carrying a line of levels across a river large amount of data were taken with a level under identical conditions. If the average value and standard deviation observed for a particular level is 2.3211 m and 0.0169 m respectively, find the chances of getting an erroneous measurement:

- i. in between 2.3549 m and 2.3718 m.
- ii. in between 2.338 m and 2.3549 m.
- iii. more than 2.3549 m.

[2+2+1 = 5]

2) The following three angles A, B and C observed at a station point P (P is internal point of Traverse as shown in Fig.). A: $77^{\circ}12'12'' \pm 3''$ B: $138^{\circ}48'30'' \pm 4''$ C: $143^{\circ}59'08'' \pm 5''$ Determine their corrected values.

[6]



3) Find the coordinate of the reflector station point if the coordinate of the instrument station point is (550,650,150), the slope distance is 450 m, the Zenith angle at the instrument station is 75° , Physical height of instrument at instrument station is 1.5 m, Physical height of the reflector at reflector station is 1.75 m, horizontal angle of the line connecting the instrument and reflector is 60° . [6]

4) In a carrying a line of levels across a river, the following nine recordings were taken with a level under identical conditions– 2.322, 2.321, 2.346, 2.350, 2.306, 2.312, 2.300, 2.306, 2.326. Calculate: Average error, Mean square error, Probable error of a single measurement and Probable error of an average. [6]

5) Following are the observed values of an angle: $60^\circ 30' 20''$ (weights-2), $60^\circ 30' 18''$ (weights-2), $60^\circ 30' 19''$ (weights-3). Calculate: i) Probable error of a single measurement of unit weight, ii) Probable error of an average and iii) Probable error of a single measurement of weight 2. [6]

6) If four central angle in a station point of traverse is: A: $110^\circ 20' 48''$ (weight:4) ; B: $92^\circ 30' 12''$ (weight:1) ; C: $56^\circ 12' 00''$ (weight:3) ; D: $100^\circ 57' 04''$ (weight:2). Determine their corrected values. [6]

7) Find the most probable values of angle A and B from the following observations (by forming normal equations):
 $A = 15^\circ 10' 20''$ (weight 2); $B = 25^\circ 10' 40''$ (weight 3); $A + B = 40^\circ 21' 20''$ (weight 5)
[6]

8) Briefly discuss about the different types of EDM instruments. [6]

BACHELOR OF ENGINEERING (CIVIL ENGINEERING) EXAMINATION 2022
(Second Year; Second Semester)

SURVEYING II

Time: Three Hours

Full Marks 100

(Part I: 30 Marks, Part II: 30 Marks, Part III: 35 Marks)

Use a separate Answer-Script for each Part

Question No.	Part III (35 Marks)	Marks
Attempt all questions from this Part		
1	(a) Write short notes on: - 'Spectral Reflectance', 'Global Positioning System (GPS)', and 'Spectral Reflectance Curve'. (b) Draw a typical 'Spectral Reflectance Envelope' for Deciduous and Coniferous type tree. (c) Why Ground Truth Verification (GTV) is essential for remote sensing job?	2x3=6 10 4
2	(a) What is called reference data in remote sensing? Give three examples of reference data. Which one is most authentic reference data and why? (b) What is the utility of reference data in remote sensing? (c) Define 'Spectral Response Patterns' and 'Spectral Signature'	6 2 2
3	What is the difference between 'spectral reflectance envelope' and 'spectral reflectance curve'? Why this difference occurs?	5