

BACHELOR OF ENGINEERING IN CIVIL ENGINEERING EXAMINATION 2024
(Second Year, Second Semester)

SURVEYING II

Time: Three Hours

Use separate answer script for each Part

Full Marks: 100
(P-I: 30+ P-II: 35+ P-II:35)

SL No	PART I (30) (ATTEMPT ALL QUESTIONS)		Marks
1	(a)	What is 'Ground Truth Verification (GTV)'? Why it is essential?	CO5 3+2=5
	(b)	A group of same species of trees existing on both side of a hill. The group of trees on one side of the hill is showing different reddish tone than the trees on other side of the hill. Why? How do you identify that they are of same species?	2+3=5
2		Draw a typical 'spectral reflectance envelope' for deciduous and coniferous type tree.	CO5 10
3	(a)	"Spectral reflectance data collected by a reflectometer for two different features may be same, and similar features may be different". Explain the correctness of the statement.	CO5 4
	(b)	When GPS is being used, how many minimum number of satellite should get connected, and why?	3
	(c)	How do you use GPS in remote sensing work? Write down the utility of the data collected by GPS.	2+1=3

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Form A: Paper –Setting Blank

Ref No.: Ex/CE/PC/B/T/225/2024

B.E. Civil Engineering 2nd Year 2nd Semester Examination, 2024**(1st / 2nd Semester / Repeat / Supplementary / Annual / Biannual)****SUBJECT: SURVEYING-II**

(Name in full)

Full Marks: 100

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

(35 marks for this part)

Use a separate Answer-Script for each part

Question No.	Part-II	Marks
	Answer Question-1 and any Two questions from the rest (All questions fall under C01)	
Q.1) A)	Fill in the blanks with appropriate word(s): a) The tangential angle of the long chord is called b) A vertical curve ofconfiguration is not usually considered for complicity of calculation. c) The angle between the original tangent and the tangent common to both transition and circular curve is called d) A pitot tube is required for measurement of of any waterbody. e) The sounding stations are located by for deep seas. f) In tunnel survey the very first step of field work comprises g) In large-scale hydrographic survey primary horizontal control is usually established by virtue of	1*7=7
B)	State whether the under-mentioned statements are True or False with necessary justifications: a) Reverse curve is not suited for meandering path of hilly areas. b) Direct line method is recommended for locating the sounding stations when they are scattered over the water body. c) Simm's method is followed for transference of levels in the tunnel.	2*3=6

Form A: Paper –Setting Blank

Ref No.: Ex/CE/PC/B/T/225/2024

B.E. Civil Engineering 2nd Year 2nd Semester Examination, 2024**(1st/ 2nd Semester /Repeat/ Supplementary / Annual /-Biannual)****SUBJECT: SURVEYING-II**

(Name in full)

Full Marks: 100

Time: Two hours/Three hours/Four hours/ Six hours**(35 marks for this part)**

Use a separate Answer-Script for each part

No. of Question	Part-II	Marks
Q.2)	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.	4
	b) A simple curve is to be introduced in between two straight lanes; meeting at a chainage of 779.45m . The angle of intersection for the straights is given as 22°34' . The radius of simple curve is fixed at 228.94m . Set out the simple curve by the method of "Tangential Angle" using a theodolite of 20" least count.	7
Q.3)	a) "Shift of the circular curve bisects the transition curve and vice-versa" - prove it.	5
	b) While designing a bridge an ascending gradient (+0.75%) is found to meet a descending gradient (- 0.56%) . The chainage and the reduced level at the point of intersection are 431m and 308.57m respectively. Calculate the reduced levels (RLs) of various station pegs on a vertical curve. Consider the rate of change of grade as 0.13% per 30m .	6
Q.4)	a) Describe the "Two Theodolite Method" of locating sounding stations with the help of a pertinent sketch and relevant expressions.	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 ∠ABC was 127°48' . The observed angles ∠AOB and ∠BOC were 31°52' and 43°37' respectively. What are the distances of (O) from A and C?	7

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B.E. CIVIL ENGINEERING SECOND YEAR SECOND SEMESTER EXAM 2024**SUBJECT: SURVEYING II (CE/PC/B/T/225)****Time: 3 hours****Full Marks:100****Instructions: Use Separate Answer scripts for each part.****Part - III (35 Marks)**

Sl. No.	Question	CO	Marks
1. A)	Find the coordinate of the reflector station point if the coordinate of the instrument station point is (550,650,150), the slope distance is 500 m, the Zenith angle at the instrument station is 60° , Physical height of instrument at instrument station is 1.75 m, Physical height of the reflector at reflector station is 2.50 m, horizontal angle of the line connecting the instrument and reflector is 45° .	[CO1]	[6]
1. B)	Briefly Discuss the fundamentals quantities measured by total station. How are they can be used to find the level and coordinates of observed station? Or, List different types of EDM instruments and briefly write about each one of them.	[CO1]	[5]
2. A)	If three angle of a triangle ABC were recorded as follows: A: $70^\circ 14' 10''$ (weight : 4) ; B: $56^\circ 40' 35''$ (weight : 3) ; C: $53^\circ 04' 52''$ (weight : 2)). Determine their most probable values.	[CO2]	[6]
2. B)	If three angle of a triangle ABC were recorded as follows: A: $68^\circ 20' 40'' \pm 3''$ B: $55^\circ 15' 20'' \pm 02''$ C: $56^\circ 24' 15'' \pm 4''$ Determine their most probable values.	[CO2]	[6]
2. C)	Find the most probable values of angle A and B from the following observations (by forming normal equations): A = $40^\circ 20' 30.4''$ (weight 1); B = $36^\circ 18' 25.2''$ (weight 2); A + B = $78^\circ 38' 50.3''$ (weight 3)	[CO2]	[6]
2. D)	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 2.32 m and 0.01 m respectively, find the chances of getting an erroneous measurement: i. in between 2.3 m and 2.31 m. ii. in between 2.29 m and 2.33 m. iii. more than 2.35 m. iv. less than 2.30 m. You can use the frequency distribution table given below:	[CO2]	[6]

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.00	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.10	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.20	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.30	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.40	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.50	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.60	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.70	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.80	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.90	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.00	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.10	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.20	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.30	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.40	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.50	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.60	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.70	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.80	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.90	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.00	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.10	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.20	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.30	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.40	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.50	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.60	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.70	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.80	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.90	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.00	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990