Course Code: 19CE0104 **R19**

SIDDHARTH GROUP OF INSTITUTIONS: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Course & Branch: B.Tech - CE

Subject with Code : Surveying & Geomatics (19CE0104) **Regulation:** R19

Year & Sem: II-B.Tech & I-Sem

UNIT –I

PRINCIPLES OF SURVEYING, ANGLES, AZIMUTHS, BEARING AND TYPES OF SURVEYING

1	Define a) Magnetic meridian and true meridian. b) Whole circle bearing and reduced bearing. c) Dip and declination. d) Closed traverse and open traverse. **e)** Fore bearing and back bearing.	 [L1][CO2] [L1][CO2] [L1][CO2] [L1][CO2] [L1][CO2]	 **[2M]** **[3M]** **[3M]** **[2M]** **[2M]**
2	Explain in detail the classifications of surveying.	[L1][CO1]	**[12M]**
3	a. A tape 20 m long of standard length of 840F was used to measure a line.The mean temperature during measurement being 650. The measured distance was 882.10 meters. The following being the slopes. $2^0 10'$ For 100 m $4^0 12'$ For 150 m $1^0 6'$ For 50 m $7^0 48'$ For 200 m $3^0 0'$ For 300m $5^0 10'$ For 82.10m Find the true length of the line if the coefficient of expansion is 65x10-7 per 10F. b. Calculate the sag correction for a 30 m steel under a pull of 100 N in three equal spans of 10 m each. Weight of one cubic meter of steel = 0.078N. Area of cross section of tape = 0.08sq.cm	[L3][CO2] [L3][CO2]	**[6M]** **[6M]**
4	With neat sketch, explain the prismatic compass by indicating their parts.	[L2][CO2]	**[12M]**
5	The following bearings were observed in running a closed traverse. At what stations do you suspect local attraction? Find the correct bearings of lines and also compute the included angles. LINE | FORE BEARING | BACKBEARING AB | 71°05' | 250°20' BC | 110°20' | 292°35' CD | 161°40' | 341°40' DE | 220°50' | 40°05' EA | 300°50' | 121°10'	[L3][CO2]	**[12M]**
6	A steel tape was exactly 20 m long at 55°F when supported throughout its length under a pull of 10 kg. A line was measured with this tape under a pull of 16 kg and at a mean temperature of 80°F and found to be 780 m long. The cross-sectional area of the tape = 0.03 cm2, and its total weight=.8kg.Coefficient of expansion of tape =	[L3][CO2]	**[12M]**

	6.2x10-8 per ˚F and E for steel = 2.109 X 106 kg/cm2. Compute the correction per tape length.		
7	Explain briefly the obstacles of chaining of a line with neat sketch	[L2][CO2]	**[12M]**
8	a. Briefly explain the various accessories in chain surveying. b. What are the duties of a surveyor?	[L2][CO1] [L1][CO1]	**[6M]** **[6M]**
9	What are the different tape correction and how they are applied?	[L3][CO2]	**[12M]**
10	a. Briefly explain the principles of surveying? **b.** Write short notes on types of errors.	[L2][CO1] [L1][CO1]	**[6M]** **[6M]**

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UNIT –II

LEVELING AND CONTOURING

1	a) Differentiate between back sight and foresight. b) Define contour interval and horizontal equivalent. c) What is a bench mark? Describe different types of bench marks. d) Write a note on self-reading staff. e) Define contour gradient.	[L1][CO3] [L2][CO3] [L1][CO3] [L1][CO3] [L1][CO3]	**[2M]** **[3M]** **[3M]** **[2M]** **[2M]**
2	a) Write short notes on errors in leveling b) Discuss the effects of curvature and refraction in leveling.	[L1][CO3] [L2][CO3]	**[6M]** **[6M]**
3	Describe in detail how you would proceed in the field for i. Profile leveling ii. Interpolation of contour.	[L2][CO3] [L2][CO3]	**[6M]** **[6M]**
4	The following staff readings were observed successively with a level the instrument is moved by third sixth and eighth readings. 2.228 :1.606 :0.988 :2.090 :2.864 :1.262 0.602 :1.982 :1.044 :2.684 m enter the reading in record book and calculate R.L. if the first reading was taken at a B.M of 432.383m. Find also the difference in level between the first and the last points. Use Height of Instrument method.	[L3][CO3]	**[12M]**
5	The following staff readings were observed successively with level, the instrument has been moved forward after the second, fourth and eighth readings: 0.875, 1.235, 2.310, 1.385, 2.930, 3.125, 4.125, 0.120, 1.875, 2.030 and 3.765. The first reading was taken with the staff held upon a benchmark of elevation 132.135m. Enter the readings in level book-form and reduce the levels. Find also the difference in level between the first and the last points. Tabulate the field book and calculate the levels of the points. Use Rise and Fall method	[L3][CO3]	**[12M]**
6	**The following readings have been taken from a page of an old level book. It is required to reconstruct the page. Fill up the missing quantities and apply the usual checks.**	[L3][CO3]	**[12M]**

Station	BS	IS	FS	Rise (+)	Fall (-)	RL	Remark
1	3.125					?	B.M
2	?		?	1.325		125.505	CP
3		2.320			0.055	?	
4		?		?		125.850	
5	?		2.655		?	?	CP
6	1.620		3.205		2.165	?	CP
7		3.652			?	?	
8			?			123.090	T.B.M

7	a) In leveling between two points A and B on opposite sides of a river, the level was set up near A and the staff readings on A and B were 2.642m and 3.228m	[L3][CO3]	**[6M]**

	respectively. The level was then moved and set up near B, the respective staff readings on A and B were 1.086m and 1.664m. Find the true difference level of A and B. b) Write short notes on difficulty in leveling.	[L1][CO3]	**[6M]**
8	What are the indirect methods of locating a contour? Write about any two method.	[L2][CO3]	**[12M]**
9	a) Define contour. State the various characteristics of contour lines. b) Mention the uses of contour in civil engineering works?	[L1][CO3] [L2][CO3]	**[6M]** **[6M]**
10	a) Write short notes on methods of leveling. b) Briefly explain the temporary adjustment of leveling.	[L1][CO3] [L2][CO3]	**[6M]** **[6M]**

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UNIT –III

THEODOLITE AND TACHEOMETRIC SURVEYING

1	a) Differentiate between transiting and swinging. b) Define traversing c) Define closing error. d) Write a note on movable hair method in tacheometric surveying. e) Give any two advantage of tacheometric surveying.	[L1][CO4]	**[12M]**
2	a) Write about parts of the Transit Theodolite. Explain in detail. b) What are the different errors in theodolite work? How are they eliminated?	[L1][CO4] [L1][CO4]	**[6M]** **[6M]**
3	For the following traverse, compute the length CD, so that A, D and E may be in one straight line. Line / Length(m) / Bearing AB / 110° / 83°12′ BC / 165° / 30°42′ CD / ? / 346°06′ DE / 212° / 16°18′	[L5][CO4]	**[12M]**
4	Determine the R.L of the top of a temple from the following data. Station A and B are in line with the top of the temple. Inst Station / Reading on BM(m) / Vertical Angle / R.L of BM A / 1.085 / 10°48′ / R.L of BM = 150.000m B / 1.265 / 7°12′ / AB=50 m	[L3][CO4]	**[12M]**
5	Derive an expression to find the height of an object by double plane method.	[L5][CO4]	**[12M]**
6	a) What is an analytical lens? Establish the basic equation for an analytic lens. b) What is tacheometry? What are different systems of tacheometric measurements?	[L5][CO4] [L5][CO4]	**[6M]** **[6M]**
7	a) Find the horizontal and vertical distances by tangential method when both angles are angles of elevation. b) How would you, determine the constants K and C of a Tacheometer.	[L3][CO4] [L3][CO4]	**[6M]** **[6M]**
8	The following readings were taken by a tacheometer with the staff held vertical. The tacheometer is fitted with Analytic lens and the multiplying constant is 100. Find out the horizontal distance from A to B and the R.L of B. Inst. station / Staff station / Vertical angle / Staff readings / Remarks A / BM / -6º00' / 1.100,1.153, 2. 060. / R.L. of B.M = 976.000 A / B / 8°00'. / 0.982, 1.105, 1.188 /	[L5][CO4]	**[6M]**
9	The vertical angles to vanes fixed at 0.5m and 3.5m above the foot of the staff held vertically at a point were - 00° 30’ and + 10 °12’ respectively. Find the horizontal distance and the reduced level of the point, if the level of the instrument axis is 125.380meters above datum.	[L5][CO4]	**[12M]**
10	a. Write the temporary adjustments of a theodolite. b. How do you measure horizontal angle between two points with the help of a theodolite by repetition method?	[L1][CO4] [L3][CO4]	**[6M]** **[6M]**

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UNIT –IV
CURVES

1	a) Differentiate between simple curve and compound curve. b) Give the relationship between the radius and the degree of a simple curve. c) Mention the various methods of setting out the simple curve. d) Write a note on two theodolite method of curve setting. e) Draw a neat sketch of reverse curve.	[L1][CO5] [L1][CO5] [L1][CO5] [L1][CO5] [L1][CO5]	**[3M]** **[2M]** **[2M]** **[2M]** **[3M]**
2	Explain various elements of a simple curve with a neat sketch.	[L4][CO5]	**[12M]**
3	a) Define and draw a typical compound curve. Under what circumstance compound curves are provided. b) Derive the expression for the elements of a compound curve.	[L4][CO5] [L4][CO5]	**[6M]** **[6M]**
4	Mention the various methods of setting out of simple curve. Explain with sketch offsets from long chord method in detail.	[L3][CO5]	**[12M]**
5	Describe with sketch the method of setting a simple circular curve by Rankine's deflection angle method.	[L4][CO5]	**[12M]**
6	a) Write short notes on reverse curves. b) Explain the procedure of setting out of curve by two theodolite methods.	[L1][CO5] [L2][CO5]	**[4M]** **[8M]**
7	Two tangents intersect at chainage 1250 m. The angle of intersection is 1500. Calculate all data necessary for setting out a curve of radius 250 m by the deflection angle method. The peg intervals may be taken as 20 m. prepare a setting out table when the least count of the Vernier is 20". Calculate the data for field checking.	[L3][CO5]	**[12M]**
8	Two straight lines AC and CB, to be connected by a 30 curve, intersect at a chainage of 2760m. The WCBs of AC and CB are 45030' and 75030' respectively. Calculate all necessary data for setting out the curve by the method of offsets from the long chord.	[L3][CO5]	**[12M]**
9	A compound curve is made up of two arcs of radii 380 m and 520 m. The deflection angle of the combined curve is 1050 and that of the first arc of radius 380 m is 580. The chainage of the first tangent point is 848.55 m. find the chainage of the point of intersection, common tangent point, and forward tangent point.	[L3][CO5]	**[12M]**
10	a) Write short notes on types of circular curves. b) Define degree of curve. Derive a relation between the radius and degree of a curve.	[L1][CO5] [L1][CO5]	**[6M]** **[6M]**

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UNIT –V

ELECTRONIC DISTANCE MEASUREMENTS

1	Define the following terms. i. Cycle. ii. Frequency. iii. Wave length iv. Period. v. Phase of a wave.	 [L1][CO6] [L1][CO6] [L1][CO6] [L1][CO6] [L1][CO6]	 **[2M]** **[3M]** **[3M]** **[2M]** **[2M]**
2	a) Explain in detail about the infrared type of EDM instrument. b) Write short notes on total stations.	[L3][CO6] [L1][CO6]	**[6M]** **[6M]**
3	Explain with sketch the principle of EDM instrument.	[L2][CO6]	**[10M]**
4	Briefly explain the types of EDM instrument.	[L2][CO6]	**[12M]**
5	How will you measure the horizontal angle and vertical angle by using total station?	[L2][CO6]	**[12M]**
6	Describe in detail about the following EDM instruments. (i) Microwave instrument (ii) Visible light instrument.	[L1][CO6]	**[12M]**
7	a) Explain about AM and FM modulation. b) What is modulation? Explain the necessity of modulation.	[L2][CO6] [L2][CO6]	**[6M]** **[6M]**
8	Explain in detail about the Wild T-1000 Electronic Theodolite.	[L3][CO6]	**[12M]**
9	Describe with sketch, the fundamental measurement of angles and distances by total station.	[L2][CO6]	**[12M]**
10	a) List out and explain the properties of EM waves. b) State and brief about transit time.	[L1][CO6] [L1][CO6]	**[6M]** **[6M]**

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