


**SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR**

Siddharth Nagar, Narayanavanam Road – 517583

**QUESTION BANK (DESCRIPTIVE)**
**Subject with Code :** Surveying (16CE105)

**Course & Branch:** B.Tech - AE

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

**Regulation:** R16

**UNIT –I**
**PRINCIPLES OF SURVEYING, ANGLES, AZIMUTHS, BEARING AND  
TYPES OF SURVEYING**

1. a) Briefly explain the principles of surveying? 6M
- b) Write short notes on types of errors. 6M
2. Explain in detail the classifications of surveying. 12M
3. a) Briefly explain the methods of obstacles in chaining. 6M
- b) A steel tape was exactly 30 m long at 20°C when supported throughout its length under a pull of 98N. A line was measured with this tape under a pull of 147N and at a mean temperature of 32°C and found to be 780 m long. The cross-sectional area of the tape = 0.03 cm<sup>2</sup>, and its total weight = 6.8N. For steel  $\alpha = 11 \times 10^{-6}$  per °C and E for steel = 20.58 X 10<sup>6</sup> N/cm<sup>2</sup>. Compute the true length of the line if the tape was supported during measurement (i) at every 30 m (ii) at every 15 m. 6M
4. With neat sketch, explain the prismatic compass. 12M
5. At what stations do you suspect local attraction? Find the correct bearings of lines and also compute the included angles. 12M

LINE	FORE BEARING	BACKBEARING
AB	66°20'	246°20'
BC	139°30'	318° 50'
CD	189°40'	11°20'
DA	300°30'	119° 30'

6. Explain with neat sketch the radiation and intersection method in plane table surveying. 12M
7. Explain two point problem and three point problem with sketches. 12M
8. a) Briefly explain the various accessories (any three) in chain surveying. 6M
- b) What is local attraction and how it is detected and eliminated? 6M
9. What are the different tape correction and how they are applied? 12M
10. Define
  - i. Magnetic meridian and true meridian. 2M
  - ii. Whole circle bearing and reduced bearing. 2M
  - iii. Dip and declination. 2M
  - iv. Closed traverse and open traverse. 2M
  - v. Fore bearing and back bearing. 2M

**UNIT –II**  
**LEVELLING AND CONTOURING**

1. a). Write short notes on methods of levelling. 6M  
 b). Briefly explain the temporary adjustment of levelling. 6M
2. a). Write short notes on errors in levelling 6M  
 b). Discuss the effects of curvature and refraction in levelling. 6M
3. What are the indirect methods of locating a contour? Write about any two method. 12M
4. Describe in detail how you would proceed in the field for (i) profile levelling (ii) Reciprocal levelling. 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 132.136M. Enter the readings in level book-form and reduce the levels. Apply the usual checks. Find also the difference in level between the first and the last points. 12M
6. The following consecutive readings were taken with a dumpy level and 4 m levelling staff on a continuously sloping ground at common intervals of 30 m 0.905 (on A), 1.745, 2.345, 3.125, 3.725, 0.545, 1.390, 2.055, 2.955, 3.445, 0.595, 1.015, 1.850, 2.655, 2.945 (on B). The RL of A was 395.500 m. Tabulate the page of field book and calculate the levels of the points. 12M
7. 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. 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

8. a) Define contour. State the various characteristics of contour lines. 6M  
 b) Mention the uses of contour in civil engineering works? 6M
9. a) In levelling 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 2.642 and 3.228m respectively. The level was then moved and set up near B, the respective staff readings on A and B were 1.086 and 1.664. Find the true difference level of A and B. 6M  
 b) Write short notes on difficulty in levelling. 6M

10. a) Differentiate between back sight and foresight. 2M
- b) Define contour interval and horizontal equivalent. 2M
- c) What is a bench mark? Describe different types of bench marks. 2M
- d) Write a note on self reading staff. 2M
- e) Define contour gradient. 2M

**UNIT -III**  
**THEODOLITE AND TACHEOMETRIC SURVEYING**

1. a) Write the temporary adjustments of a theodolite 4M
- b) How do you measure horizontal angle between two points with the help of a theodolite by repetition method? 6M
2. a) Give a list of the permanent adjustments of a transit theodolite. 4M
- b) What are the different errors in theodolite work? How are they eliminated? 6M
3. Write about parts of the Transit Theodolite. Explain in detail. 12M
4. For the following traverse, compute the length CD, so that A, D and E may be in one straight line. 12M

Line	Length(m)	Bearing
AB	110°	83°12′
BC	165°	30°42′
CD	?	346°06′
DE	212°	16°18′

5. 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. 12M

Inst Station	Reading on BM(m)	Vertical Angle	R.L of BM
A	1.085	10°48′	R.L of BM = 150.000m AB=50 m
B	1.265	7°12′	

6. Derive an expression to find the height of an object by double plane method. 12M
7. a) What is an analytical lens? Establish the basic equation for an analytic lens. 6M
- b) What is tacheometry? What are different systems of tacheometric measurements? 6M
8. a) Find the horizontal and vertical distances by tangential method when both angles are angles of elevation. 6M
- b) How would you, determine the constants K and C of a Tacheometer. 4M
9. The vertical angles to vanes fixed at 0.6M and 3.6M 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. 12M
10. 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. 12M

Inst.station	Staff station	Vertical angle	Staff readings	Remarks
A	BM	-6°00′	1.100,1.153, 2. 060.	R.L. of B.M =
	B	8°00′.	0.982, 1.105, 1.188	976.000

**UNIT –IV**  
**CURVES**

1. a) Write short notes on types of circular curves. 6M  
b) Define degree of curve. Derive a relation between the radius and degree of a curve. 4M
2. Explain various elements of a simple curve with a neat sketch. 12M
3. a) Define and draw a typical compound curve. Under what circumstance compound curves are provided. 4M  
b) Derive the expression for the elements of a compound curve. 6M
4. Mention the various methods of setting out of simple curve. Explain with sketch offsets from long chord method in detail. 12M
5. Describe with sketch the method of setting a simple circular curve by Rankine's deflection angle method. 12M
6. a) Write short notes on reverse curves. 4M  
b) Briefly explain the field procedure of setting out of curve by two theodolite methods. 6M
7. Two tangents intersect at chainage 1250 m. The angle of intersection is  $150^{\circ}$ . 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. 12M
8. Two straight lines AC and CB, to be connected by a 30 curve, intersect at a chainage of 2760 m. 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. 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  $105^{\circ}$  and that of the first arc of radius 380 m is  $58^{\circ}$ . 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. 12M
10. Two tangents AB and BC intersect at a point B at chainage 150.5 m. calculate all the necessary data for setting out a circular curve of radius 100 m deflected angle  $30^{\circ}$  by the method of offsets from the long chord. 12M

**UNIT –V**  
**ELECTRONIC DISTANCE MEASUREMENTS**

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

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