

SURVEYING
SHORT ANSWER TYPE QUESTIONS

UNIT - I

- a) Explain about the principles of surveying. [2]
- b) A 20m chain used for a survey was found to be 20.10m at the beginning and 20.30m at the end of the work. The area of the plan drawn to a scale of 1cm=8m was measured with the help of a planimeter and was found to be 32.56 sq.cm. Find the true area of the field?
- c) Mention the methods of leveling and explain any two in detail? [2]
- d) Explain about the characteristics of contours. [3]
- e) Distinguish between closed traverse and open traverse. [2]
- f) Explain how you would measure vertical angle with a theodolite? [3]
- g) What are different methods of setting of a curve?
- h) Explain about the principles of Tacheometry. [3]
- i) What are the applications of Total station? [2]
- j) What are the working principles of EDM instrument?
- h) Explain about the principles of Tacheometry. [3]

UNIT - II

- a) Write down principle of surveying. [2]
- b) What are the objectives of surveying? [3]
- c) List out the uses of Planimeter. [2]
- d) Write down the characteristics of contours. [3]
- e) Where we use theodolite? [2]
- f) Define base line. [3]
- g) Define Tacheometer. [2]
- h) Explain the procedure of tangential system of measurement. [3]
- i) Write down the principle of electromagnetic distance measuring system.
- j) How Global Positioning System (GPS) works?

UNIT - III

- a) Define the term magnetic bearing. [2]
- b) Explain how a chain is tested and adjusted in the field. [3]
- c) Give the conventional contour representations for the following land features.
 - i) A gentle slope ii) A hill iii) A ravine iv) A depression. [2]
- d) Define the terms: i) Line of collimation ii) Intermediate sight iii) Change point. [3]
- e) Differentiate between closed and open traverses. [2]
- f) Define the following terms in Transit Theodolite survey:
 - i) Horizontal axis
 - ii) Transiting
 - iii) Change of face. [3]
- g) What are different methods of designation of a curve? [2]
- h) Define Tacheometry. What are its fundamental objects? [3]

- i) What is a Total Station? [2]
- j) Write short note on satellite constellation

UNIT - IV

- a) What is the principle of surveying? Explain it in detail. [2]
- b) What is local attraction? How will you determine it in a closed traverse?
- c) What do you understand by contour interval and on what factors does it depend? [2]
- d) How a horizontal surface is different from a level surface? [3]
- e) What are the different types of sources of errors in a Theodolite work? [2]
- f) What are the advantages of Trigonometric leveling over direct leveling? [3]
- g) What is meant by Degree of curve? Give relation with the radius of curve. [2]
- h) Explain the functions of the following curves: i) simple circular curve ii) reverse curve. [3]
- i) What are the various applications of GPS in Civil Engineering field? [2]
- j) What are the various types of EDM instruments?

UNIT - V

- a) What are the primary classifications of surveying? [2]
- b) What are the advantages of observing back bearing in a closed traverse? [3]
- c) What do you mean by the following terms?
 - i) Meridian distance
 - ii) Double meridian distance
 - iii) Double parallel distance.
- d) What are the methods of determination of area from plan? [3]
- e) What are the conditions to be satisfied in a closed theodolite traverse? [2]
- f) What are advantages of traversing over triangulation? [3]
- g) What are the advantages of Tacheometric surveying over other methods?
- h) What is meant by Shift of a curve? [3]
- i) Mention advantages of using Total station. [2]
- j) Explain briefly the working principle of GPS

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SURVEYING QUESTION BANK
LONG QUESTIONS
UNIT-I

1. Discuss briefly the classification of surveying based on (i) purpose and (ii) instruments and Discuss the care and adjustments of surveying instruments.
2. What are the different types of Bearings and Meridians?
the following bearings were observed while traversing with a compass

Line	F.B.	B.B
AB	45°45'	226°10'
BC	96°55'	277°5'
CD	29°45'	209°10'
DE	324°48'	114°48'

Mention which station was affected by local attraction and determine the corrected bearings?

3. Explain the difference between WCB system and RB system?
and What is local attraction ? How is it detected and eliminated?
4. What are the sources of errors in compass survey and what are the precautions to take to eliminate them? And Distinguish between prismatic compass and surveyors compass.
5. The following bearings were observed with a compass. Calculate the interior angles?

Line	Fore bearing
AB	60°30'
BC	122°0'
CD	46°0'
DE	205°30'
EA	300°0'

6. Convert the following whole circle bearings to quadratic bearings?
i) 29°45' ii) 114°48' iii) 205°30' iv) 327°24'
And what is a well conditioned triangle? Why is it necessary to use well conditioned triangles?
7. Describe different kinds of chains used for linear measurements?
And Explain the following terms (i) Arrows (ii) Plumb bob (iii) Ranging rods

UNIT-II

8. Describe with the help of sketches the characteristics of contours?
And what are the methods of leveling explain in detail?
9. The following staff readings were observed successively with a level the instrument having been moved after third, sixth and eighth reading 2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044, 2.684 metres. Enter the above readings in a page of a level book and calculate the R.L of points if the first reading was taken with a staff held on a benchmark of 432.384m.
10. what is profile leveling? Describe the procedure for conducting profile leveling of a proposed highway?
11. Calculate the volume of earth work by prismatic formula in a road embankment with the data in mts:

Chainage along the centerline	0	100	200	300	400
Ground level	201.70	202.90	202.40	204.70	206.90

Formation level at chainage 0 is 202.30, top width is 2.00m, side slopes are 2 to 1. The longitudinal gradient of the embankment is 1 in 100 rising. The ground is assumed to be level all across the longitudinal section.

12. The following offsets were taken in meters from a chain line to a hedge

Distance	0	30	60	90	120	150	180
Offset	9.4	10.8	12.5	10.5	14.5	13.0	7.5

Compute the area included between the chain line, the hedge and end offset by the Simpson's rule.

13. Describe the "height of instrument" and "rise and fall" methods of computing the levels. Discuss the merits and demerits of each.
14. The following perpendicular offsets were taken at 10 meters intervals from a survey line to an irregular boundary line: 3.25, 5.60, 4.20, 6.65, 8.75, 6.20, 3.25, 4.20, 5.65 Calculate the area enclosed between the survey line, the irregular boundary line, and the first and last offsets, by the application of i) average ordinate rule ii) trapezoidal rule and iii) Simpson's rule.

UNIT-III

15. What are the different types of errors that will occur in Theodolite work? How are they eliminated? How is the closing error of a traverse adjusted graphically?
16. State and explain in brief about what errors are eliminated by repetition method. How will you set out a horizontal angle by method of repetition?
17. Explain clearly, with the help of illustrations, how a traverse is balanced. Distinguish between chain surveying and traverse surveying?
18. Two instrument stations were selected 150m apart in the same vertical plane as the object. The vertical angles observed to the two stations were $120^{\circ} 13'30''$ and $90^{\circ} 10'40''$. The readings on a staff held at a bench mark of RL 1080.00m were 2.35 and 1.05m from the stations, the instrument reading being higher for the station further from the object. Find the RL of the object if the vertical angles were read on mark 5m from the ground..
19. Explain the measurement of horizontal angles in a theodolite instrument. Discuss in detail the temporary and permanent adjustment in case of a theodolite.
20. Explain different parts of theodolite with the help of a neat sketch. and explain the temporary adjustments of a transit theodolite.
21. In a closed traverse has a following lengths and bearings

Line	length(m)	bearing
AB	204.0	$87^{\circ}30'$
CB	226.0	$20^{\circ}20'$
CD	187.0	$280^{\circ}0'$
DE	192.0	$210^{\circ}3'$
EA	?	?

Calculate the length and bearing of line EA?

UNIT-IV

22. A tacheometer is fitted with an anallactic lens and the constants are 100 and 0. The reading corresponding to the cross-wire on a staff held vertical on a point B was 2.295m when sighted from A. If the vertical angle was $+250'$ and the horizontal distance AB was 150m, calculate the stadia wire readings and thus show that the two intercept intervals are equal. Using these values calculate the level of B if that of A was 50.0m and the height of the instrument is 1.15m
23. What do you understand about tacheometry? Discuss the errors in stadia surveying. And List the various methods of setting out a simple circular curve.

24. A tacheometer was setup at station A and the following readings were obtained on a vertically held staff:

Station	Staff station	Vertical angle	Hair readings	Remarks
A	B.M	-2° 18'	3.225,3.550,3.875	R.L of B.M =437.655m
	B	+8° 36'	1.650,2.515,3.380	

Calculate the horizontal distance from A to B and the R.L of B, if the constants of the instruments were 100 and 0.4

25. Draw a neat sketch of a circular curve and show its various elements thereon. and Explain what determines the nature of the curves. Classify them with examples?
26. What is a tacheometer? What are different systems of tacheometric measurements? and What are the advantages of tacheometric surveying over other methods?
27. Determine the gradient from a point P to another point Q from the following observations made with a tacheometer fitted with an anallactic lens. The constant of the instrument was 100 and the staff was held vertical.

Instrument Station	Staff station	bearing	Vertical angle	Hair readings
R	P	130°	+10° 32'	1.255,1.810,2.365
	Q	220°	+5°06'	1.300,2.120,2.940

28. Determine the gradient from a point A to another point B from the following observations made with a tacheometer fitted with an anallactic lens. The constant of the instrument was 100 and the staff was held vertically

Instrument Station	Staff station	bearing	Vertical angle	Hair readings
P	A	134°	+10° 32'	1.365,1.915,2.470
	B	224°	+5°06'	1.065,1.885,2.705

UNIT-V

29. Write notes on the different segments of GPS and Explain the advantages and disadvantages of terrestrial photogrammetry.

30. What are the applications of GPS and Explain about the electromagnetic wave theory.
31. What are the components of the Global positioning system? and Explain about the different types of EDM instruments.
32. Explain what are the latest advancements in total station techniques and their significance. and explain relief and tilt displacement in photogrammetry ?
33. Explain various segments of GPS. and explain the principle behind terrestrial photogrammetry?
34. Describe the salient features of a total station and explain how angles are measured using it.
35. What do you understand about electronic tachometers? What is the difference between an EDM mounted on theodolite and an electronic tachometer? and explain flight planning?



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