R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, November/December - 2017
SURVEYING
(Common to CE, CEE)

Time: 3 Hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.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?   [3]
 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?   [3]

PART-B

(50 Marks)

2.a) Define surveying. Discuss briefly the classification of surveying based on:
    i) Purpose   ii) Instruments.
 b) Differentiate between plane surveying and geodetic surveying.   [6+4]

OR

3.a) What is the limit of accuracy in compass surveying?
 b) Below are the bearings observed in a traverse survey conducted with a prismatic compass at a place where local attractions was suspected?

Line	F.B	B.B
PQ	$124^0 30'$	$304^0 30'$
QR	$68^0 15'$	$246^0 0'$
RS	$310^0 30'$	$135^0 15'$
SP	$200^0 15'$	$17^0 45'$

At what stations do you suspect local attraction? Find the corrected bearings of the lines and also calculate the included angles.   [7+3]

4.a) The following staff readings were taken with a level. The instrument having been shifted after the 4th, 7th and 10th readings. The R.L of the starting point(B.M) is 100.00m. Enter the readings in the form of a level book page and reduce the level by the collimation method and apply the usual checks.
    2.65, 3.74, 3.83, 5.27, 4.64, 0.38, 0.96, 1.64, 2.84, 3.48, 4.68 and 5.26.
 b) Distinguish between Line of collimation and line of sight.   [7+3]

OR

5.a) How do you determine the capacity of a reservoir using contours.

b) 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. [3+7]

6. 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. [10]

Instrument station	Staff station	Bearing	Vertical angle	Staff readings (m)
R	P	130^0	$+10^032'$	1.255,1.810,2.365
	Q	220^0	$+5^006'$	1.300,2.120,2.940

OR

7. a) What are the different errors in theodolite work?

b) What are the limits of precision in theodolite traversing? [5+5]

8. 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	$-2^018'$	3.225,3.550,3.875	R.L of B.M =437.655m
	B	$+8^036'$	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. [10]

OR

9. a) What are the different methods of designation of a curve?

b) Draw a neat sketch of a circular curve and show its various elements thereon. [5+5]

10. a) Explain what are the latest advancements in total station techniques and their significance.

b) What are the uses of an electronic Total station? [6+4]

OR

11. a) Explain various segments of GPS.

b) Write down various applications of GPS. [5+5]

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