R15

Code No: 123AM

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B.Tech II Year I Semester Examinations, November/December - 2016**

**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) State the principles of surveying. [2]
b) List out the tape corrections. [3]
c) Differentiate between simple levelling and compound levelling. [2]
d) Define: Contour, Horizontal equivalent and Contour gradient. [3]
e) State the limitations of Simpson's rule. [2]
f) List out the formulae for computing the volumes [3]
g) Define Transiting and swinging the telescope in theodolite surveying. [2]
h) List out the temporary adjustments of a theodolite. [3]
i) List out the methods for setting out simple curve by chain and tape. [2]
j) Differentiate between stadia and tangential methods of tacheometry. [3]

## Part-B

**(50 Marks)**

2. Explain about classification of surveying. [10]

**OR**

3. The following were observed in a compass traverse. Correct for local attraction. [10]

| Line | Fore bearing | Back bearing |
|---|---|---|
| AB | $68^0\ 15'$ | $248^0\ 15'$ |
| BC | $148^0\ 45'$ | $326^0\ 15'$ |
| CD | $224^0\ 30'$ | $46^0\ 00'$ |
| DE | $217^0\ 15'$ | $38^0\ 15'$ |
| EA | $327^0\ 45'$ | $147^0\ 45'$ |

4. The following consecutive readings were taken with a dumpy level and 4 m levelling staff on a continuously sloping ground at 30 m intervals: 0.680, 1.455, 1.855, 2.330, 2.885, 3.380, 1.055, 1.860, 2.265, 3.540, 0.835, 0.945, 1.530 and 2.250 m. the R.L. of a starting point was 80.750 m.
a) Carry out reduction of heights by the collimation method.
b) Determine the gradient of the line joining the first and last points. [5+5]

**OR**

5. List out the methods of contouring and explain any one method in detail. [10]

6. The following offsets were taken from a chain line to a hedge at regular intervals of 5.0 m: 2.72, 3.46, 5.23, 6.80, 4.86, 3.35, 3.00, 2.50, and 1.60 m. Determine the area included between the chain line and the hedge by using:
a) Mid-ordinate rule
b) Trapezoidal rule and
c) Simpson's rule. [4+3+3]

**OR**

7. A road at the formation level is 6 m wide and has a side slope of 2:1. The road is to have a constant R.L. of 200 m. The ground is level across the centre line of the road. The following observations were made:

| Chainage (m) | 0 | 20 | 40 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|
| Surface level along centre line of road | 204.6 | 203.0 | 200.8 | 201.6 | 202.0 | 200.2 |

Estimate the volume of earth work. [10]

8. List out the methods for measuring horizontal angle and explain any two methods in detail. [10]

**OR**

9. The observations were made on the top A of a flag AB on a hill from two instrument stations P and Q, 100 m apart, the stations P and Q being in the line with A. The angles of elevation of A at P and Q were $30^0$ 05′ and $17^0$ 52′ respectively. The staff reading upon the BM (RL = 311.29 m) were, respectively, 2.690 and 3.815 when the instrument was at P and Q, the telescope being horizontal. Determine the elevation of the foot B of the flag if AB is 3.5 m. [10]

10. The following are the distances of the staff position from the instrument and the corresponding staff intervals. Calculate the tacheometric constants. [10]

| D (m) | 20 | 50 | 100 | 120 |
|---|---|---|---|---|
| S (m) | 0.195 | 0.495 | 0.997 | 1.197 |

**OR**

11. The chainage of the intersection of two straights having the deflection angle of $50^0$ is 1680.0 m. If the radius of the curve is 450 m, calculate the following:
a) Tangent distance
b) Length of the curve
c) Length of the long chord and
d) Apex distance. [10]

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