

**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° 15'	248° 15'
BC	148° 45'	326° 15'
CD	224° 30'	46° 00'
DE	217° 15'	38° 15'
EA	327° 45'	147° 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:
- Mid-ordinate rule
  - Trapezoidal rule and
  - Simpson's rule.

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

8. Estimate the volume of earth work.
8. List out the methods for measuring horizontal angle and explain any two methods in detail.

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  $30^{\circ} 05'$  and  $17^{\circ} 52'$  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. The following are the distances of the staff position from the instrument and the corresponding staff intervals. Calculate the tacheometric constants.

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

11. The chainage of the intersection of two straights having the deflection angle of  $50^{\circ}$  is 1680.0 m. If the radius of the curve is 450 m, calculate the following:
- Tangent distance
  - Length of the curve
  - Length of the long chord and
  - Apex distance.

