R13

Code No: 113AM

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, November - 2015

SURVEYING

(Common to CE, CEE, AGE)

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 main principle of surveying? [2M]
b) Distinguish between prismatic compass and surveyor's compass. [3M]
c) Define line of collimation and change point in levelling. [2M]
d) What is the object of preparing a contour map? [3M]
e) State the trapezoidal rule. [2M]
f) The following perpendicular offsets were taken at 10 m intervals from a chain line to an irregular boundary line: 3.10, 4.20, 5.35, 6.45, 7.15, 8.25, 7.95 and 5.20. Find the area by Simpson's rule. [3M]
g) What do the terms 'telescope normal' and 'telescope inverted' mean? [2M]
h) What is the principle of electronic theodolite? [3M]
i) What are the multiplying constant and additive constant of a tacheometer? [2M]
j) List out the applications of Geographical Information System. [3M]

PART-B **(50 Marks)**

2.a) What is orientation? Discuss any one method of orientation with a neat sketch.
b) A chain line PQ intersects a pond. Two points A and B are taken on the chain line on opposite sides of the pond. A line AC, 250 m long, is set out on the left of AB and another line AD, 300 m long, is set out on the right of AB. Points C, B and D are in the same straight line. CB and BD are 100 and 150 m long respectively. Calculate the length of AB. [5+5]

OR

3. The following are the fore and back bearings of the sides of a closed traverse:

Side	FB	BB
AB	$150^0\ 15'$	$330^0\ 15'$
BC	$20^0\ 30'$	$200^0\ 30'$
CD	$295^0\ 45'$	$115^0\ 45'$
DE	$218^0\ 00'$	$38^0\ 00'$
EA	$120^0\ 30'$	$300^0\ 30'$

Calculate the interior angles of the traverse. [10]

4. The following consecutive readings were taken with a level and a 4-m levelling staff on a continuously sloping ground at common intervals of 30 m:
0.855 (on A), 1.545, 2.335, 3.115, 3.825, 0.455, 1.380, 2.055, 2.855, 3.455, 0.585, 1.015, 1.850, 2.755, 3.845 (on B). The RL of A was 380.500. Determine the gradient of AB. [10]

OR

5. Discuss the characteristics of contour lines with neat sketches. [10]

6. The following offsets are taken from a survey line to a curved boundary line:

Distance (m)	0	5	10	15	20	30	40	60	80
Offset (m)	2.50	3.80	4.60	5.20	6.10	4.70	5.80	3.90	2.20

Find the area between the survey line, the curved boundary line, and the first and the last offsets by Trapezoidal rule and Simpson's rule. [10]

OR

7. An embankment of width 10 m and side slopes 1.5:1 is required to be made on a ground which is level in a direction transverse to the centre line. The central heights at 40 m intervals are as follows: 0.90, 1.25, 2.15, 2.50, 1.85, 1.35 and 0.85 m. Calculate the volume of earth work by Trapezoidal and Prismoidal methods. [10]

8.a) Describe the process of measuring the horizontal angle.
b) Briefly explain about the temporary adjustments of a theodolite. [5+5]

OR

9. Find the reduced level of the top of a church tower from the following data: [10]

Inst. stn	Reading on BM (m)	Vertical angle	RL of BM (m)	Distance AB in (m)	Remarks
A	1.698	10^0 12′	363.075	30	A and B are in line with the top of the tower
B	1.382	8^0 20′			

10.a) Briefly explain about the methods of tacheometry.
b) Determine the values of stadia constants from the following observations: [5+5]

Instrument station	Staff reading on	Distance (m)	Stadia Readings (m)	
			Lower	Upper
O	A	150	1.255	2.750
	B	200	1.000	3.000
	C	250	0.750	3.255

OR

11.a) Discuss the uses of Global Positioning System (GPS) in Civil Engineering.
b) A simple circular curve is to have a radius of 573m. The tangents intersect at chainage 1060 m and the angle of intersection is 120^0. Find
i) Tangent Length ii) Length of curve iii) Length of long chord. [5+5]

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