Roll No. .....

24067

B. Tech 3rd Semester Civil engg.

(Branch-XI)

Examination – December, 2011

SURVEYING - I

Paper : CE-207-F

Time : Three hours] *[Maximum Marks :100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt in all *five* questions, but at least ***one*** from each section. Draw neat sketches as and where required.

SECTION – A

1. (a) A steel tape 20 m long standarised at 60° F with a pull of 20 kg was used for measuring a baseline.

Find the correction per tape length, if the temperature at the time of measurement was 65° F and the pull exerted was 20 kg. Weight of 1 cubic cm of steel = 7.86 g, weight of tape = 0.8 kg, and $E = 2.109 \times 10^6$ kg/cm^2. Coefficient of expansion of tape per 1°F = 6.5×10^{-6}. 10

(b) What are the various errors in taping ? 10

2. (a) A chain was tested before starting the sarvey, and was found to be exactly 20 m. At the end of the survey, it was tested again and was found to be 20.12 m. Area of the plan of the field drawn to a scale of 1 cm = 6m was 50.4 sq.cm. Find the true area of the field in sq. metres. 10

(b) What is the principle of chaining ? 10

SECTION – B

3. (a) The following bearings were observed with a compass :

Line	Fore Bearing	Back Bearing
AB	64° 00'	244°00'
BC	81°00'	261°00'
CD	156°00'	333°00'
DE	187°0'	6°0'
EA	179°00'	9°00'

Where do you suspect the local attraction ? Find the correct bearings. 10

(b) Differentiate between prismatic and surveyor's compass. 10

4. (a) The following staff readings were observed successively with level and 5 metre leveling staff on a continuously sloping ground :

0.875, 1.235, 2.31, 0.385, 2.93, 0.125, 4.125, 0.120, 1.875, 0.030, 3.75.

The first reading was taken with the staff held upon a bench mark of elevation 132.135. Enter the readings in the level book-form, draw a profile diagram and find the levels by height of instrument method. apply the checks.

2 + 2 + 4 + 2 = 10

(b) Define contours, contour interval and draw sketch of vertical cliff and an overhanging.

3 + 3 + 2 + 2 = 10

SECTION – C

5. (a) Define orientation and its importance. What are the various methods of orientation ? 2 + 4 = 6

(b) For a closed traverse ABCDE, the length and the bearings of lines were measured with tape and theodolite as follows :

Line	Length (m)	Bearing
AB	365.0	N 30°40' W
BC	205.0	N 35°00' E
CD	160.0	S 25°15' E
DE	197.0	S 56°50,E
EA	275.0	S 35°50,W

Compute the consecutive coordinates and closing error. Adjust the coordinates. 5 + 2 + 7 = 14

6. (a) A tacheometer is set up at an intermediate point on a traverse course PQ and the following observations are made on a vertically held staff :

Instrument station	Vertical angle	Staff intercept	Axial hair readings	Remarks
P	8°36'	2.350	2.105	R.L. of P
Q	6°6'	2.055	1.895	321.50 m

The instrument is fitted with an anallactic lens and the constant being 100. Draw a profile diagram and compute the elevation of Q and distance between P and Q. 2 + 5 + 3 = 10

(b) Define transition curve, their advantages and need. What are the various methods to find length of a transition curve ? 5 + 5 = 10

SECTION – D

7. (a) Derive distance and elevation formulae for inclined sight staff vertical. 10

(b) What are the various types of theodolite ? Describe the temporary and permanent adjustments of a theodolite. 4 + 6 = 10

8. (a) Two straights AI and BI meet at a chainage of 3450 m. A right handed simple circular curve of 250m radius joins them. The deflection angle

between the two straights is 50°. Tabulate the necessary data to layout the curve by Rankine's method of deflection angles. Take the chord interval as 20 m. 10

(b) Define vertical and horizontal curves at length with neat sketch. 5 + 5 = 10
