

Reg. No. : M E T E N G G

Question Paper Code : 71247

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Third Semester

Civil Engineering

CE 2204/CE 37/10111 CE 307 — SURVEYING – I

(Regulation 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the difference between plane and geodetic surveying?
2. A road actually 1410m long when measured by a defective 30m chain was found to be 1406m. What correction does the chain need?
3. What do you understand by magnetic declination?
4. What are the advantages of plane table surveying?
5. Define line of collimation and change point.
6. What is meant by interpolation of contours?
7. What do you mean by face left and face right observations? How can you change the face?
8. What are consecutive coordinates and independent coordinates?
9. What are the requirements of a good transition curve?
10. What is geometric method of orientation in an underground surveying?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain Chaining by steps in
 - (1) moving up the hill and
 - (2) moving downhill. (12)
- (ii) A tape 100m long, 6.35m wide and 0.5mm thick was used to measure a line, the apparent length of which was found to be 1986.96m. The tape was standardized under a pull of 6.75 kg. But after the line was measured, it was found that the pull actually used during the measurement was 7.75 kg. What was the true length of the line if the tape was standardized and used on the flat? Take Young's modulus $E = 2 \times 10^6 \text{ kg/cm}^2$. (4)

Or



- (b) (i) A chain line ABC crosses a river at right angles. B and C are located on the near and the distant banks respectively. $AB = 25\text{m}$, $BD = 5\text{m}$, $\angle ABD = 90^\circ$. The clockwise bearings of C and A with reference to the magnetic north taken at D are 300° and 210° respectively. Find the width of the river. (8)
- (ii) What are the general principles of surveying? Why in surveying the cardinal principle of 'work from whole to part and never from part to work' is to be followed? (8)
12. (a) (i) The following are the bearings of a closed traverse. Find which station is free from local attraction and work out the bearings (10)

Side	FB	BB
AB	$191^\circ 45'$	$13^\circ 05'$
BC	$39^\circ 30'$	$222^\circ 00' 30''$
CD	$22^\circ 15'$	$200^\circ 30'$
DE	$242^\circ 45'$	$60^\circ 45'$
EA	$330^\circ 15'$	$147^\circ 45'$

- (ii) Explain the method of radiation in plane tabling. (6)
- Or
- (b) (i) The bearing of a line AB was measured as $N79^\circ 50'E$. There was local attraction at A. In order to determine the correct bearing of the line, a point O was selected at which there was no local attraction. The bearing of lines AO and OA were found to be $S52^\circ 40' E$ and $N50^\circ 20' W$ respectively. Calculate the correct bearing of the line AB. (8)
- (ii) What do you understand by "Three point problem"? How is it solved in the field. (8)
13. (a) (i) What is the difference between temporary and permanent adjustments of a dumpy level? Explain the temporary adjustments made in a leveling instrument. (8)
- (ii) The following observations were made during the testing of a dumpy level.

Instrument at	Staff reading at		Remarks
	A	B	
A	1.725	2.245	Distance between A and B = 200 m
B	2.145	3.045	RL of A = 450.000m

Is the instrument in alignment? What should be the staff reading on A during the second set up of the instrument for the line of collimation to be exactly horizontal? To what reading should the line of collimation be adjusted when the instrument is at B? What should be the RL of B? (8)

Or

- (b) (i) What is a contour line? With sketches indicate how they are used to represent various surfaces on ground. (6)
- (ii) The following perpendicular offsets were taken from a chain line to a boundary :
- | | | | | | | | |
|--------------|-----|-----|-----|-----|-----|------|------|
| Distance (m) | 0 | 6 | 12 | 18 | 24 | 30 | 36 |
| Offset (m) | 5.4 | 4.5 | 3.6 | 2.7 | 1.8 | 2.25 | 3.15 |

Calculate the area enclosed between the chain line and the offsets by Trapezoidal rule and Simpson's rule. (10)

14. (a) Explain how you would measure horizontal and vertical angles using a theodolite. (16)

Or

- (b) (i) What are the possible sources of error while using a theodolite? How can they be eliminated? (8)
- (ii) A four sided traverse ABCD has the following data : (8)

Line AB	500 m	Roughly east
Line BC	245 m	178°
Line CD	Not obtained	270°
Line DA	216 m	1°

Find the correct bearing of AB.

15. (a) (i) What are the usual difficulties in ranging simple curves and how are they obviated? (10)
- (ii) Two straight lines AB and BC intersect at chainage (68 + 27), the intersection angle being 140°. It is desired to connect these two straights by a simple curve of 5°. Calculate the radius of the curve and the chainage of the tangent points if unit chord is 30 m. (6)

Or

- (b) (i) What is a reverse curve? Where is it provided? State its advantages. (6)
- (ii) Two straight roads AB and CD both produced intersect at V. $CBV = 30^\circ$ and $BCV = 120^\circ$. It is proposed to introduce a reverse curve consisting of two circular arcs AT and TD, T lying on BC. Length BC is 791.71 m and radius of arc AT is 800 m. Chainage of B is 1000 m. Calculate the radius of arc TD, length of arc AT, length of arc TD and the chainage of point D. (10)

