Seat No.	

[4757]-108

S.E. (Civil) (Second Semester) EXAMINATION, 2015

SURVEYING

(2008 PATTERN)

Time : Three Hours　　　　Maximum Marks : 100

N.B. :— (*i*)　Answers to the two Sections should be written in separate answer-books.

(*ii*)　Your answer will be valued as a whole.

(*iii*)　Neat diagrams must be drawn wherever necessary.

(*iv*)　Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.

(*v*)　Assume suitable data, if necessary.

(*vi*)　Answer any *three* questions from Section I and any *three* questions from Section II.

SECTION I

1.　(*a*)　Define surveying. Explain the type of survey based on instruments.　[5]

　　(*b*)　What is local attraction ? Explain how it is detected ? [5]

(c) The following are the bearings of the line of the traverse PQRST in a running a compass traverse :

Line	For Bearing	Back bearing
PQ	242° 00'	63° 00'
QR	89° 45'	270° 15'
RS	70° 00'	250° 00'
ST	292° 45'	112° 45'
TP	20° 00'	198° 30'

Calculate the included angles and usual checks. Also draw the neat sketch. [8]

Or

2. (a) State and explain the accessories required for plane table surveying ? What are their functions ? [6]

(b) State the method of plane table surveying. Explain intersection method with suitable sketch. [6]

(c) The following are the observed bearings of the line of the traverse ABCDEA with a compass in a place where local attraction was suspected : [6]

Line	Fore Bearing	Back bearing
AB	191° 45'	13° 00'
BC	39° 30'	222° 30'
CD	22° 15'	200° 30'
DE	242° 45'	62° 45'
EA	330° 15'	147° 45'

Calculate the corrected bearings of the lines.

3. (*a*) Define the following terms with sketches : [6]

   (*i*) Line of collimation

   (*ii*) Contour

   (*iii*) Reduced level.

(*b*) Differentiate between direct and indirect methods of contour. [4]

(*c*) The following notes refer to the reciprocal level with taken one level : [6]

Instrument at Station	Staff reading on		Remarks
	A	**B**	
A	1.156	2.597	Dist. Between A and B = 1200 m
B	0.987	2.418	RL of A = 625.555 m

Find :

   (*i*) True RL of B

   (*ii*) Combined correction for curvature and refraction

   (*iii*) Errors in collimation adjustment of the instrument.

Or

4. (*a*) Explain the principal axes of dumpy level with sketches. [5]

(*b*) Write a short note on uses of Toposheets. [5]

(*c*) The following set of observations were taken with dumpy level, calculate missing values of the following table and apply usual checks : [6]

SN	BS	IS	FS	HI	RL	Remarks
1	2.300			X	270.950	BM
2		X			271.420	
3	3.795		1.050	275.995	X	CP
4		X			273.534	
5		X			274.201	
6			X		274.868	Last point

5. (*a*) Define the following terms with sketches : [6]

(*i*) Latitude

(*ii*) Telescope inverted

(*iii*) Face left

(*iv*) Plunging

(*b*)   Explain the different cases of omitted measurements.   [6]

(*c*)   Explain the procedure of measurement of vertical angle by 20″ Theodolite.   [4]

Or

6.   (*a*)   Explain the following :   [4]

(*i*)   Consecutive coordinates

(*ii*)   Independent coordinates.

(*b*)   Explain the procedure of measurement of horizontal angle by 20″ Theodolite by repetition method.   [6]

(*c*)   Write short notes on :   [6]

(*i*)   Adjustment of closed traverse

(*ii*)   Use of Theodolite traverse.

SECTION II

7.   (*a*)   Explain any *two* permanent adjustments of transit Theodolite with sketch.   [6]

(*b*)   What is tachometer ? State the situations where it is used.   [5]

(*c*) A tachometer was set up at an intermediate point on a P and the following readings were obtained on a vertically held staff : [7]

Inst. station	Staff station	Vertical angle	Staff intercept readings (m)			Remark
			Upper	Middle	Lower	
P	BM	−5° 0"	1.00	1.250	1.450	RL of
	Q	+ 10° 0"	0.900	1.100	1.400	BM = 1000.00 m

The constants were 100 and 0.1. Calculate the horizontal distance PQ and RL of Q.

Or

8. (*a*) What is tachometry ? What are its advantages and disadvantages ? [6]

(*b*) Derive the expression for the horizontal distance and vertical distance when the staff held is vertical. [6]

(*c*) Describe the principle of stadia tachometry. [6]

9. *(a)* What are the types of curve ? State its suitability. [4]

(b) Explain setting out a simple circular curve by chord produced method. [4]

(c) Tabulate the data required for setting out a circular curve by Rankine's method considering the following data : [8]

(i) Angle of intersection = 135°

(ii) Change of point intersection = 1620 m.

(iii) Degree of curve = 5°

(iv) Peg interval = 30 m.

Or

10. *(a)* Explain setting out a simple circular curve by Rankine's method. [5]

(b) Draw the neat sketch of transition curve. State necessity of transition curve. [5]

(c) Two tangents AB and BC intersects at a point B at chainage 150.50 m, the radius of curve is 100 m and deflection angle is 30°. Calculate the data required for setting out a circular curve by offsets from long chord method. [6]

11. (*a*) Explain with neat sketch the setting out of building with conventional instruments. [5]

(*b*) What do you understand by horizontal and vertical controls in construction survey ? What are the requirements of good control ? [6]

(*c*) Describe the procedure of laying alignment of drainage line. [5]

Or

12. (*a*) Explain in brief the procedure of transferring the alignment of tunnel through the shaft. [5]

(*b*) What do you mean by reconnaissance survey of road ? What data is collected during this survey ? [6]

(*c*) Write a short note on Total station. [5]