

SUBJECT CODE NO:- P-55
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(Civil) Examination MAY/JUNE-2016
Surveying I
(Revised)

[Time:Three Hours]

[Max Marks:80]

“Please check whether you have got the right question paper.”

N.B

- i) Q.No.1 and Q.No.6 are compulsory.
- ii) Answer any two questions from the remaining questions of each section A and section B.
- iii) Figures to the right indicate full marks.
- iv) Assume suitable data, if necessary.

Section A

- | | | |
|-----|--|--|
| Q.1 | Attempt (<u>any five</u>) | 10 |
| | <ol style="list-style-type: none"> i) What is surveying? What is the object of surveying? ii) Give the primary classification of surveying and distinguish between them. iii) How are the scales represented in a map? What is representative fraction? iv) What is well conditioned triangle? Why it is preferred? v) What is a line ranger? What is the advantage of its use? vi) Explain “traverse survey” distinguish an open traverse from a closed traverse vii) Distinguish between fore bearing and back bearing? How they are related to each other. viii) What is reciprocal levelling ix) Compare “collimation method” with rise and fall method. x) Explain the accessories used in plane table surveying | |
| Q.2 | <ol style="list-style-type: none"> a) A steel tape was exactly 30m long at 20⁰c when supported throughout its length under pull of 15kg. A line was measured with a pull of 10kg applied to the tape at a mean temperature of 12⁰c and found to be 800m long. The cross sectional area of the tape = 0.04cm², total weight of the tape = 0.7kg, α of steel = 11×10^{-6} per⁰ c and E for steel = 2.1×10^6 kg/cm². Compute the true length of the line of the tape was supported during measurement <ol style="list-style-type: none"> i) At every 30m ii) at every 15m. j) Give an illustration of prismatic compass and explain the use of prismatic compass in traverse surveying | 10

05 |
| Q.3 | <ol style="list-style-type: none"> a) What are the different methods of plotting a traverse? Explain each of the methods in brief. b) Following reading were taken with a dumpy level and a 4m levelling staff on a continuously sloping ground at 30m intervals 0.685, 1.425, 1.875, 2.335, 2.965, 3.310, 1.115, 1.870, 2.235, 3.860, 0.965, 1.620 and 2.220
The R.L of the starting pt. was 80.750m. <ol style="list-style-type: none"> i) Rule out a page of level field book and enter the above readings ii) Carry out the reduction of heights by collimation method. iii) Apply arithmetic check. iv) Determine the gradient of the line joining the 1st and the last point | 07
08 |
| Q.4 | <ol style="list-style-type: none"> a) How do you estimate the volume (storage capacity) of a reservoir using a contour map? b) In a two peg- test of a dumpy level following reading were taken <ol style="list-style-type: none"> i) Instrument at C midway between A and B AB = 100m, staff reading on A = 1.585 and staff reading on B = 1.225. ii) Instrument near A; staff reading on A = 1.425, staff reading on B = 1.150
Is the line of collimation inclined upwards or downwards and by how much? With the instrument at A what should be the staff reading on B in order to place the line of collimation truly horizontal? | 07
08 |

[P-2016]

- Q.5 a) Give the Bessel's graphical solution to "Three point problem". 08
 b) What are Lehman's rules? Explain in detail. 07

Section B

- Q.6 Attempt (Any Five) 10
- 1) Give the uses of a theodolite
 - 2) What do you mean by a transit and a non-transit theodolite?
 - 3) What are the temporary adjustments and permanent adjustments?
 - 4) Enumerate the fundamental lines of a theodolite.
 - 5) What are direct angles and deflection angles?
 - 6) How do you measure magnetic bearing of a line with a theodolite
 - 7) Explain the steps involved in using the planimeter
 - 8) Give the importance of earthwork planning.
 - 9) What are the advantages of tacheometric surveying?
 - 10) What are the systems of tacheometric measurements

- Q.7 a) Describe the method of determining the constants of a tacheometer from field measurements. 05
 b) The following observations were taken with a tacheometer fitted with an anallatic lens, the staff being held vertically, determine the distances AB and BC and the reduced levels of A, B and C. $K = 100$ 10

Inst station	Height of inst axis (m)	Staff station	Vertical angle	Hair readings			Remark
				l	m	u	
A	1.5	B.M	$-5^{\circ}30'$	0.950	1.525	2.110	R.L of B.M = 500m.
A	1.5	B	$+8^{\circ}15'$	0.840	1.410	1.915	
B	1.6	C	$+12^{\circ}30'$	1.75	2.040	3.000	

- Q.8 a) Following perpendicular offsets were taken from a chain line to a boundary. 08
 Calculate the area by i) trapezoidal rule ii) Simpson's rule.

Distance (m)	0	5	10	15	20	30	40	50	65	80
Offset(m)	3.00	4.80	3.10	3.35	2.80	1.50	4.20	4.50	2.5	3.10

- b) What do you understand by "Haulage planning"? Explain "Mass diagram". 07
- Q.9 a) Explain "Double sighting" method of extension of a line in the field 08
 b) Explain the method of measurement of deflection angles in road survey. 07
- Q.10 a) What are the possible sources of error using a theodolite? How can they be eliminated? 07
 b) Explain the object and theory of anallatic lens. 08