Code : 011404

B.Tech 4th Semester Examination, 2017

Field Measurement

Time : 3 hours   Full Marks : 70

Instructions :

(i) There are Nine Questions in this Paper.

(ii) Attempt Five questions in all.

(iii) Question No. 1 is Compulsory.

(iv) The marks are indicated in the right-hand margin.

1. Answer any seven of the following questions: 14

(i) The object of surveying is to prepare

   (a) drawing

   (b) cross-section

   (c) map

(ii) The diagonal scale is used to read

   (a) one unit

   (b) two units

   (c) three consecutive units

(iii) Compensating error is proportional to

   (a) L

   (b) sqrt of L

   (c) L^2

(iv) A triangle is said to be well-conditioned when its angles should lie between

   (a) 30^0

   (b) 20^0 and 150^0

   (c) 15^0 and 135^0

(v) In an optical square, the mirrors are fixed at an angle of

   (a) 30^0

   (b) 45^0

   (c) 60^0

(vi) The main object of running a tie line is

   (a) to check accuracy of work

   (b) to take details of a nearby objects

   (c) to take an offset for detailed surveying

   (d) none of the above

(vii) In a prismatic compass, the zero is marked on the

   (a) north end

5. (a) State the advantages and disadvantages of plane table survey over other types of survey.   7

(b) Describe the procedure of setting up the plane table over a station.   7

6. (a) When is reciprocal levelling done? Describe the method along with a sketch.   6

(b) The following set of observations were taken to reach a given point. Form this point onwards a rising gradient of 1 in 15 starts. Calculate the required staff reading for the remaining four points. These points were spaced at an equal distance of 10 m each.   8

Sl No.	BS	IS	FS	RL	Remarks
1.	3.250			270.500	BM
2.	2.300		2.800		CP
3.		1.830			
4.		1.500			
5.	3.795		1.050		CP and given point slope starts,
6.					1ˢᵗ pt
7					2ⁿᵈ point
8.					3ʳᵈ point
9.			5		4ᵗʰ point
					P.T.O.

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7. (a) What are the characteristics of contour lines?   6

(b) The following offsets were taken at 15 m intervals from a survey line to an irregular boundary line: 3.50, 4.30, 6.75, 5.25, 7.50, 8.80, 7,90, 6.40, 4.40, 3.25 m. Calculate the area enclosed between the survey line, the irregular boundary, and the first and last offsets, by using Simpson's rule.   8

8. (a) Describe the method of determining the constants of a tachometer from field measurement.   6

(b) In a tachometric survey the instrument had a multiplying constant of 100 and was fitted with an anallatic lens. The staff was held normal to the line of sight and the following observations were taken:

Instrument Station	Height of axis	Staff at	Vertical angle	Staff readings
O	1.6 m	BM	−3° 0′	1.400, 2.140, 2.880
O	1.6 m	CP	+5° 20′	1.205, 1.795, 2.385
A	1.4 m	CP	−5⁰ 30′	1.395, 2.010, 2.625

If the RL of the BM is 192.105m, calculate te RL of the station A.   8

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9. Write Short notes on any three: 14

(i) Ranging

(ii) Surveyor's Compass

(iii) Orientation

(iv) Tachometry

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