

(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 1240**

Roll No.

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**B.Tech.**

(SEM. III) ODD SEMESTER THEORY

EXAMINATION 2013-14

**SURVEYING**

*Time : 3 Hours*

*Total Marks : 100*

**Note :—Attempt all Sections.**

**SECTION—A**

1. Attempt any ten parts. Write in brief : **(2×10=20)**
- Enlist various methods for classification of survey based on different criteria.
  - What are the assumptions made in plain survey ?
  - What are the basic sources of error in survey ? Give detail.
  - Describe different types of chains used for linear measurements.
  - Define the following terms :  
Level line, Mean sea level, Datum, Bench mark.
  - Enlist various causes of errors in leveling.
  - What is Declination and its variations ?
  - Explain various types of Bearing.
  - State the two point problem in plane table surveying.
  - Enlist various methods of different traversing.
  - What is the difference between triangulation and trilateration ?
  - What is the requirement of transition curve ?

## SECTION-B

2. Attempt any six parts of the following : (5×6=30)
- (a) What is Surveying ? What are the basic principles of surveying ? Explain with examples.
  - (b) A nominal distance of 30 metres was set out with a 30 m steel tape from a mark on the top of one peg to a mark on the top of another, the tape being catenary under a pull of 10 kg and at a mean temperature of 70° F. The top of one peg was 0.25 metre below the top of the other. The top of the higher peg was 460 metres above mean sea level. Calculate the exact horizontal distance between the marks on the two pegs and reduce it to mean sea level, if the tape was standardized at a temperature of 60° F, in catenary, under a pull of 8 kg.
  - (c) The following consecutive readings were taken with a level and 5 metre leveling staff on continuously sloping ground at a common interval of 20 metres: 0.385; 1.925; 2.825; 3.730; 4.685; 0.625; 3.110; 4.485. The reduced level of the first point was 208.125 m. Rule out a page of a level field book and enters the above readings. Calculate the reduced levels of the points by rise and fall method and also the gradient of the line joining the first and the last point.
  - (d) What are contour and contour gradient ? Explain in detail various uses of contour maps.
  - (e) What are the methods of balancing the traverse ? Give details.
  - (f) What is triangulation and what are the various methods for it ?
  - (g) An instrument was set up at a point 200 m away from a transmission tower. The angle of elevation to the top of the tower was  $30^{\circ}42'$ , whereas the angle of depression to the bottom was  $2^{\circ}30'$ . Calculate the total height of the transmission tower.
  - (h) What is a vertical curve and its type ?

SECTION-C

3. Attempt any **two** parts of the following : (5×2=10)

(a) Differentiate between the following :

- (i) Plan and Map.
- (ii) Error and Mistake.
- (iii) Accuracy and Precision.
- (iv) Plane and Geodetic Survey.
- (v) Geological and Geographical Survey.

(b) Discuss in detail various kinds of errors.

(c) A derived quantity S is given by;  $S = (4.86)^2$ . Find the maximum value of error and most probable value of error.

4. Attempt any **two** parts of the following : (5×2=10)

(a) Discuss in detail the procedure used for the measurement of horizontal angle by repetition method.

(b) Explain the geometry of theodolite with figure.

(c) The following fore and back bearings were observed in traversing with a compass in place where local attraction was suspected :

Line	F.B.	B.B.
AB	38°30'	219°15'
BC	100°45'	278°30'
CD	25°45'	207°15'
DE	325°15'	145°15'

Find the corrected fore bearing and the true bearing of each of the lines given that the magnetic declination was 10° W.

5. Attempt any **two** parts of the following : **(5×2=10)**
- What are the different types of leveling staff ? State the merits and demerit of each.
  - Explain the effect of curvature and refraction, its correction. In leveling between two points A and B on opposite sides of a river, the level was set up near A and the staff readings on A and B were 2.642 and 3.228 m respectively. The level was then moved and set up near B, the respective staff readings on A and B were 1.086 and 1.664. Find the true difference in level of A and B.
  - In running fly levels from a B.M. of R.L. 250.00 m, the following readings were obtained :
 

Back sight :	1.315	2.035	1.980	2.625
Fore sight :	1.15	3.450	2.255	

From the last position of the instrument, five pegs at 20 m interval are to be set out on a uniform rising gradient of 1 in 40. The first peg is to have an R.L. of 247.245 m. Work out the staff reading required for setting the tops of the pegs on the given gradient.
6. Attempt any **two** parts of the following : **(5×2=10)**
- Which are the methods of plane tabling, enlist them with their definition and explain the procedure for any one of them.
  - What do you understand by three point problem, explain Lehmann's method for solving it.
  - Explain the procedure for setting out works building, culvert, bridges and slopes.
7. Attempt any **two** parts of the following : **(5×2=10)**
- Explain the various elements of simple circular curve with its figure.
  - Explain the characteristics of Transition curve and derive equation for ideal transition curve.
  - Two straight AI and BI meet at a chainage of 3450 m. A right handed simple circular curve of 250 m 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 20 m.