

**PARUL UNIVERSITY**  
**FACULTY OF AGRICULTURE**  
**B.Tech. (Agriculture) Winter 2019 - 20 Examination**

Semester: 2

Date: 17/12/2019

Subject Code: 20103159

Time: 10:30 A.M. to 12:30 P.M.

Subject Name: Surveying &amp; Levelling

Total Marks: 50

**Instructions**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1 Do as Directed.****A. Fill in the blanks. (Each of 0.5 mark)****(05)**

1. An ill-conditioned triangle is a triangle whose angles lie between \_\_\_\_\_ to \_\_\_\_\_.
2. The function of the compass in plane table survey is to \_\_\_\_\_.
3. In levelling, the consecutive readings were taken on the same instrument station are entered in \_\_\_\_\_.
4. The primary object of surveying is to prepared \_\_\_\_\_.
5. In Surveyor's compass, the angles are obtained in the form of \_\_\_\_\_.
6. The point of known elevation with respect to which measurements are done is called as \_\_\_\_\_.
7. The process of transferring the instrument point to the ground is called as \_\_\_\_\_.
8. The longest survey line in chain surveying is called as the \_\_\_\_\_.
9. The process of making a chain line straight is known as \_\_\_\_\_.
10. The surveying in which curvature of the earth is not considered is called \_\_\_\_\_.

**B. Multiple choice type questions. (Each of 0.5 mark)****(10)**

1. The method of surveying in which field observations and plotting proceed simultaneously
  - a) Plane Table Survey
  - b) Tachometric Survey
  - c) Chain Survey
  - d) Compass Survey
2. An imaginary line joining the points of equal elevation on the surface of the earth, represents
  - a) Contour
  - b) Level Line
  - c) Contour Gradient
  - d) Contour Interval
3. Closed contours of increasing values towards their centre, represent
  - a) a hill
  - b) a depression
  - c) a valley
  - d) steep slope
4. The main principle of surveying is to work from
  - a) part to whole
  - b) whole to part
  - c) higher to lower level
  - d) lower to higher level
5. The W.C.B. of a line is  $300^\circ$ , its Q.B. is
  - a) N  $60^\circ$ W
  - b) W  $60^\circ$ N
  - c) N  $60^\circ$  E
  - d) E  $60^\circ$ N
6. Ranging can be done using
  - a) Line Ranger
  - b) Cross Staff
  - c) Optical Square
  - d) None of the above
7. The working edge of the alidade is known as
  - a) Fiducial Edge
  - b) Working Edge
  - c) Parallel Edge
  - d) Straight Edge
8. If N is the number of sides in a closed traverse, then the sum of exterior angles should be equal to
  - a)  $(2N-4) \times 90^\circ$
  - b)  $(2N+4) \times 90^\circ$
  - c)  $(2N * 4) \times 90^\circ$
  - d)  $(N * 4) \times 90^\circ$

9. The branch of surveying which deals with the location of ancient civilization, antiquity is called  
 a) Hydrology  
 b) Military Survey  
 c) Hydrographic Surveying  
 d) Archaeological Surveying
10. In the Simpson's formula, the number of ordinates is assumed to be  
 a) Odd  
 b) Even  
 c) Neither odd or even  
 d) Circular
11. Cross hairs in surveying telescopes, are fitted  
 a) in the object glass  
 b) at the optical centre of the eyepiece  
 c) in the eye piece  
 d) in front of the eye piece
12. The surface of still water is  
 a) Level  
 b) Curved  
 c) Smooth  
 d) Horizontal
13. Metric chains are generally available in  
 a) 10m and 20m length  
 b) 20m and 30m length  
 c) 20m and 25m length  
 d) 25m and 100m length
14. Plotting of missing details or points on a plane table, is done by  
 a) Intersection  
 b) Radiation  
 c) Resection  
 d) Traversing
15. For the construction of highway (or railway)  
 a) Cross section is required  
 b) Both of them are required  
 c) Longitudinal Section is required  
 d) None of the above
16. Fore bearing of a line is equal to  
 a) B.B. + 90  
 b) B.B. + 180  
 c) B.B. - 180  
 d) B.B. - 90
17. To orient a plane table at a point with two inaccessible points, the method generally adopted, is  
 a) Intersection  
 b) Radiation  
 c) Resection  
 d) Two Point Problem
18. The constant vertical distance between two adjacent contours, is called  
 a) contour gradient  
 b) horizontal equivalent  
 c) horizontal interval  
 d) contour interval
19. Number of links per metre length of a chain are  
 a) 2  
 b) 5  
 c) 4  
 d) 8
20. The method generally preferred to for contouring an undulating area, is  
 a) chain surveying  
 b) tachometric surveying  
 c) compass surveying  
 d) plane table survey

**Q.2 Do as Directed.**

**A. Define the following. (Any five out of seven)**

**(05)**

1. Define Surveying.
2. Write the formula for correction for temperature in tapes
3. Write the full form of GIS.
4. How many links are present in a 30m chain?
5. What is the use of ranging rod and arrow in Surveying?
6. Write one disadvantage of plane table survey
7. What is the principle of Chain Surveying?

**B. Answer the following. (Any five out of seven)**

**(05)**

1. Which range of area for which Primary Surveying is applied?
2. List out the different types of chain used in surveying.
3. Define Reconnaissance.
4. Convert  $250^\circ$  (W.C.B.) to Q.B.
5. Explain the fundamental principles of surveying.
6. Write the formula for determining the height of a tower.
7. What are the different types of offsets?

**Q.3 Write short notes. (Any five out of six) (10)**

1. Define (i) Benchmark, (ii) Reduced Level.
2. Enlist the different classification depending on nature of surveying.
3. Draw following features shown by contours: (i) hill (ii) valley.
4. What are the different methods of plotting contours?
5. List out the various instruments used in compass surveying.
6. What are different methods for computation of the areas?

**Q.4 Long Questions/Example (Attempt any three out of four) (15)**

1. A 20 m chain was found to be 10 cm too long after chaining distance of 1500 m. It was found to be 18 cm too long at the end of one day's work after chaining the total distance of 3900m. Find the true distance if the chain was correct before commencement of the work.

2. The following staff readings were observed successively with a dumpy level, the instrument having moved after third, sixth and eighth readings: 2.225, 1.605, 0.995, 2.090, 2.865, 1.265, 0.600, 1.985, 1.045, and 2.685m. Enter the above readings in a page of level book and calculate the reduced levels of all the points if the first reading was taken with the staff held on bench mark of 135.75m.

3. The following offsets were taken at 15 m intervals from a survey line to an irregular boundary line: 2.50, 4.40, 6.60, 5.50, 7.40, 8.70, 7.80, 6.50, 4.30, 3.20 m. Calculate the area enclosed between the survey line, the irregular boundary line and the first and last offsets by (i.) Simpson's Rule and (ii.) Trapezoidal Rule.

4. The following bearings were taken of a closed traverse ABCD. Calculate the interior angles.

Line	AB	BC	CD	DA
F.B.	45°00'	123°00'	181°00'	289°00'
B.B.	225°00'	303°00'	1°00'	109°00'