

PARUL UNIVERSITY
FACULTY OF AGRICULTURE
B.Tech. Agriculture Engineering Summer 2018 - 19 Examination

Semester: 2
Subject Code: 20103159
Subject Name: Surveying and Leveling

Date: 26/04/2019
Time: 2:00pm to 4:00pm
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

A) Fill in the blanks (Each of 0.5 Mark) (05)

- i) An ideal vertical curve is _____.
- ii) offsetting is an operation of _____ .
- iii) An ordinary level staff is used for _____ .
- iv) Magnetic bearing of a line is an angle between _____ .
- v) The real image of an object formed by the objective, must lie _____ .
- vi) Intersection is the method of _____.
- vii) The last reading from a level station is _____.
- viii) Differential levelling means _____.
- ix) Invar tape is made up of _____.
- x) RB full form _____.

B) Multiple Choice Questions (Each of 0.5 Mark) (10)

- i) An ideal transition curve is
a) cubic parabola b) cubic spiral c) clothoid spiral d) true spiral.
- ii) Closed contours of decreasing values towards their centre, represent
a) a hill b) a depression c) a saddle or pass d) a river bed.
- iii) The accuracy of measurement in chain surveying, does not depend upon
a) length of the offset b) scale of the plotting
c) importance of the features d) general layout of the chain lines.
- iv) In levelling operation
a) when the instrument is being shifted, the staff must not be moved
b) when the staff is being carried forward, the instrument must remain stationary
c) both (a) and (b)
d) neither (a) nor (b).
- v) Geodetic surveying is undertaken
a) for production of accurate maps of wide areas
b) for developing the science of geodesy
c) making use of most accurate instruments and methods of observation
d) all the above.

- vi) If the angular measurements of a traverse are more precise than its linear measurements, balancing of the traverse, is done by
 a) Bowditch's rule b) Transit rule
 c) Empirical rule d) all of the above.
- vii) The minimum angle between two plane mirrors of optical square, is
 a) 20° b) 30° c) 45° d) 60°
- viii) For setting out a simple curve, using two theodolites
 a) offsets from tangents are required
 b) offsets from chord produced are required
 c) offsets from long chord are required
 d) none of these.
- ix) The branch of surveying in which both horizontal and vertical positions of a point, are determined by making instrumental observations, is known
 a) Tacheometry b) Tachymetry c) telemetry d) all the above.
- The diaphragm of a stadia theodolite is fitted with two additional
 x) a) horizontal hairs b) vertical hairs
 c) horizontal and two vertical hairs d) none of these.
- xi) Centering error of a theodolite produces an error
 a) in all angles equally
 b) which does not vary with the direction or pointing
 c) which varies with the direction of pointing and inversely with the length of sight
 d) none of these.
- xii) Measuring with a 30 m chain, 0.01 m too short, introduces
 a) positive compensating error b) negative compensating error
 c) positive cumulative error d) negative cumulative error.
- xiii) A back sight
 a) is always taken on a point of known elevation or can be computed
 b) is added to the known level to obtain the instrument height
 c) taken on an inverted staff is treated as negative
 d) all the above.
- xiv) The reduced bearing of a line is N 87° W. Its whole circle bearing is
 a) 87° b) 273° c) 93° d) 3°
- xv) If d is the distance between equidistant odd ordinates, the Simpson's rule for the areas, is
 a) $d/2 [h_1 + h_n + 2(h_3 + h_5 + \dots + h_{n-2}) + 4(h_2 + h_4 + \dots + h_{n-1})]$
 b) $d/3 [h_1 + h_n + 2(h_3 + h_5 + \dots + h_{n-2}) + 4(h_2 + h_4 + \dots + h_{n-1})]$
 c) $d/6 [h_1 + h_n + 2(h_2 + h_4 + \dots + h_{n-1}) + 4(h_3 + h_5 + \dots + h_{n-2})]$
 d) $d/8 [h_1 + h_n + 2(h_3 + h_5 + \dots + h_{n-2}) + 4(h_2 + h_4 + \dots + h_{n-1})]$
- xvi) The bearing of AB is 190° and that of CB is $260^\circ 30'$. The included angle ABC , is
 a) $80^\circ 30'$ b) $99^\circ 30'$ c) $70^\circ 30'$ d) none of these
- xvii) For preparation of a contour plan for a route survey
 a) method of squares is used b) method of trace contour is used
 c) method of cross profile is used d) indirect method of contouring is used.
- xviii) Global Positioning System (GPS) is a
 a) Satellite WordStation b) Satellite System
 c) Satellite Signal d) Satellite Signal

- xix) Global Positioning Service (GPS) is based on a principle called
a) Arbitration b) Trilateration c) Orbiteration d) Globalization
- xx) Global Positioning Service (GPS) uses 24 satellites in
a) 9 Orbits b) 8 Orbits c) 7 Orbits d) 6 Orbits

Q.2

A) Define the following (Any five out of seven questions) (05)

- (1) Define true meridian?
- (2) Define back Bearing?
- (3) Define back site?
- (4) Define metric chain and number of link in metric chain?
- (5) Define refraction factor?
- (6) Define surveying?
- (7) List out temporary adjustment of leveling?

B) Answer the following (Any five out of seven questions) (05)

- (1) What is Tacheometry?
- (2) What is topographic map?
- (3) What is vertical axis?
- (4) Formula of Simpson 1/3 rule ?
- (5) Full form of GPS.
- (6) What is contouring?
- (7) What is open traversing?

Q.3 Write Short notes (Any five out of six questions) (10)

- (1) Comparison between plan and map compass?
- (2) The bearings of the lines AB and BC are $150^\circ 30'$ and 83° . The included angle ABC is?
- (3) List out the various error occurs in linear measurement?
- (4) Various method of transition curves?
- (5) Illustrate various method of finding out area?
- (6) Construct a scale to measure up to a meter and represent 48 on a scale.

Q.4 Long Questions (Any three out of four questions) (15)

- (1) Theodolite was set up at station A and the angle of elevation to the top of 4m staff held at B was $8^\circ 50'$. The horizontal distance AB was 1500m. Determine the RL of the Q given That the RL of the instrument axis was 1758.32.
- (2) Discuss difference between plane and Geodetic Surveying.
- (3) Explain method of resection and Traversing for plane tabling?

(4) Discuss Spire test in detail and also the method of adjustment?