

**B.Tech 4th Semester Exam., 2018**

**FIELD MEASUREMENT**

Time : 3 hours

Full Marks : 70

*Instructions :*

- (i) The marks are indicated in the right-hand margin.*
- (ii) There are **EIGHT** questions in this paper.*
- (iii) Attempt **FIVE** questions in all.*
- (iv) Question No. 1 is compulsory.*

1. Choose the correct answer of the following  
(any seven) :

2×7=14

(a) Tilt of the staff in stadia tacheometry increases the intercept, if it is

(i) away from the telescope pointing downhill

(ii) towards the telescope pointing uphill

(iii) away from the telescope pointing uphill

(iv) None of the above

(b) Chain surveying is well adopted for

- (i) small areas in open ground
- (ii) small areas with crowded details
- (iii) large areas with simple details
- (iv) large areas with difficult details

(c) Surveys which are carried out to depict mountains, rivers, water bodies, wooded areas and other cultural details, are known as

- (i) cadastral surveys
- (ii) city surveys
- (iii) topographical surveys
- (iv) guide map surveys

(d) The number of horizontal cross-wires in a stadia diaphragm is

- (i) one
- (ii) two
- (iii) three
- (iv) four

(e) Under ordinary conditions, the precision of a theodolite traverse is affected by

- (i) systematic angular errors
- (ii) accidental linear errors
- (iii) systematic linear errors
- (iv) accidental angular errors

(f) Setting out a curve by two-theodolite method involves

- (i) linear measurements only
- (ii) angular measurements only
- (iii) both linear and angular measurements
- (iv) None of the above

(g) If the chain line which runs along N-S direction is horizontal and the ground in E-W direction is sloping

- (i) it is possible to set offsets correctly on East side
- (ii) it is possible to set offsets correctly on West side
- (iii) it is not possible to set offsets correctly on West side
- (iv) it is possible to set offsets correctly on both sides

- (h) With the rise of temperature, the sensitivity of a bubble tube
- (i) decreases
  - (ii) increases
  - (iii) remains unaffected
  - (iv) None of the above
- (i) During levelling, if back sight is more than foresight
- (i) the forward staff is at lower point
  - (ii) the back staff is at lower point
  - (iii) the difference in level, cannot be ascertained
  - (iv) None of the above
- (j) Closed contours, with higher value inwards, represent a
- (i) depression
  - (ii) hillock
  - (iii) plain surface
  - (iv) None of the above
2. (a) Derive an expression for computing horizontal distance and elevation in trigonometric levelling while base of the object is inaccessible and instrument stations are in the same vertical plane with elevated object and instrument axis are at same level.

(b) Describe various accessories required for plane table survey with neat sketch and also write their uses. 7

3. (a) Two tangent intersect at a chainage of 1320.5 m. The deflection angle being  $24^\circ$ . Calculate the following quantities for setting out a simple circular curve of radius 275 m : 7

- (i) Tangent length
- (ii) Length of long chord
- (iii) Length of curve
- (iv) Chainage of point of commencement and tangency
- (v) Apex distance
- (vi) Versed sine of curve

(b) Explain the temporary adjustment of theodolite and also write uses of theodolite. 7

4. (a) Write short notes on the following : 7

- (i) Transition curve
- (ii) Vertical curves

(b) Explain the various objectives of hydrographic survey. Also, enlist equipment used for sounding and explain any one in brief. 7

5. (a) The areas enclosed by the contour of a lake are as under :

Contour level (m)	270	275	280	285	290
Area (in sq. m)	2050	8400	16300	24600	31500

Calculate the volume of water stored between contour 270 m and 290 m by (i) trapezoidal formula and (ii) prismoidal formula.

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- (b) What is sounding? State the different methods of locating sounding and explain any one method.

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6. (a) Enlist different methods of plane tabling and explain method of traversing.

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- (b) Explain the procedure for evaluating missing quantities in a closed traverse.

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7. (a) Define trigonometric levelling. Derive the equation to find out the elevation of the object, if the base of the object is inaccessible, the instruments, stations and elevated object are in the same vertical plane and instrument axes are at the same level.

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- (b) What are the general methods of calculating area? Explain double meridian distance (DMD) method in detail.

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( 7 )

8. (a) Define (i) swinging, (ii) line of collimation, (iii) temporary adjustment of theodolite, (iv) plunging, (v) telescope normal, (vi) centering and (vii) vertical axis.

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(b) Illustrate with an example in a tabular format about repetition method of measurement of horizontal angle with the help of a theodolite.

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