

**SURVEYING
(CIVL 2101)**

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

***Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.***

Candidates are required to give answer in their own words as far as practicable.

**Group – A
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) The global positioning system operated by the us department of defence uses
(a) 6 satellites (b) 12 satellites
(c) 18 satellites (d) 24 satellites.
 - (ii) A 2° curve of chord length 20 m has radius of
(a) 573 m (b) 286.5 m (c) 143 m (d) 72.5 m.
 - (iii) The BM established by the survey of India is known as the
(a) Permanent BM (b) GTS BM
(c) Arbitrary BM (d) Temporary BM.
 - (iv) The vertical distance between two adjacent contour lines is called a
(a) Contour gradient (b) Vertical equivalent
(c) Contour interval (d) Contour equivalent.
 - (v) Which of the following accessories is not used in plane table surveying?
(a) Alidade (b) Trough compass
(c) Prismatic compass (d) Plumbing fork.
 - (vi) If the FB of a survey line is 310°30', what will be the BB?
(a) 40°30' (b) 50°30' (c) 130°30' (d) 220°30'.
 - (vii) In WCB system, a line is said to be free from local attraction, if the difference between the FB and BB are
(a) 0° (b) 45° (c) 180° (d) 90°.
 - (viii) If the BB of a survey line is 215°30', what will be the FB?
(a) (2n-4)×90° (b) (2n+4)×90° (c) (n-4)×90° (d) (2n+4)×90°
 - (ix) In surveyour's compass, the ring is graduated
(a) From 0° to 360° (b) In quadrants- 0° to 90°
(c) In any way (d) From 0° to 180°

- (x) If the WCB of a survey line is $320^{\circ}30'$, what will be the QB?
 (a) $S39^{\circ}30'W$ (b) $N39^{\circ}30'W$
 (c) $N39^{\circ}30'E$ (d) $N50^{\circ}30'W$.

Group – B

2. (a) What is a two-point problem? Explain with a neat sketch the procedure of solving a two-point problem in plane table surveying.
 (b) What are the different methods of plane tabling? Describe any of them with a sketch.

8 + 4 = 12

3. (a) Define the following:
 (i) Whole circle bearing and reduced bearing
 (ii) Fore bearing and back bearing.
 (b) The following are the observed bearings of the lines of a traverse ABCDEA with a compass in a place where local attraction was suspected.

Line	Fore Bearing	Back Bearing
AB	$188^{\circ}45'$	$7^{\circ}45'$
BC	$118^{\circ}15'$	$298^{\circ}15'$
CD	$346^{\circ}35'$	$166^{\circ}30'$
DE	$337^{\circ}05'$	$158^{\circ}10'$
EA	$293^{\circ}30'$	$113^{\circ}00'$

Find the correct bearings of the lines.

(2 + 2) + 8 = 12**Group – C**

4. (a) The following consecutive readings were taken with a dumpy level along a chain line at a common interval of 12 m. The first reading was at a chainage of 200 m where the RL is 200.000. The instrument was shifted after the fourth and ninth readings. Find the RL of all points by: the height of instrument method (HI).
 3.255, 2.305, 1.235, 0.850, 3.125, 2.760, 1.845, 1.470, 1.905, 1.225, 2.395 and 3.135m.
 (b) Define the terms 'contour line', 'contour interval' and 'horizontal equivalent'.

9 + 3 = 12

5. (a) The following observation were made using a tacheometer fitted with an anallatic lens, the multiplying constant being 100. Calculate the distance AB, and the RLs of A and B. Find also the gradient of the line AB.

Inst. Station	Height of inst.	Staff station	WCB	Vertical angle	Hair readings	Remarks
O	1.550	A B	$30^{\circ}30'$ $75^{\circ}30'$	$4^{\circ}30'$ $10^{\circ}15'$	1.150, 1.750, 2.35 1.250, 2.000, 2.750	RL of O=120.00

- (b) Write down different parts of a transit theodolite.

8 + 4 = 12

Group – D

6. A curve has a radius of 370 m and a deflection angle of 35°. The chainage of T1 is 1904.75 m. Compute and tabulate the angles and theodolite readings to set out the curve using Rankine's method.

12

7. (a) A curve is designated as a 2° curve (20-m arc). The deflection angle is 35°. Calculate the offsets from the long chord at 15-m intervals.

- (b) What do you mean by the terms 'Long chord' and 'Centre of curvature'?

8 + 4 = 12

Group – E

8. (a) Explain working principle of EDM instrument by phase difference method.

- (b) Explain with sketches the different triangulation systems.

6 + 6 = 12

9. (a) What are the differences between Plane Surveying and Geodetic Surveying?

- (b) Explain briefly the following terminologies used in aerial photogrammetry:

- (i) Flying height
- (ii) Air base
- (iii) Plumb points
- (iv) Picture plane

4 + 8 = 12

Department & Section	Submission Link
CE BACKLOG	https://classroom.google.com/c/MjY1NDkyMjYzNjM2/a/Mjc0Njk3NzYyNzA4/details

