(b) (i) What is a Total Station? Illustrate its uses.
(ii) What are the different parts of an EDM instrument?
(iii) What do you mean by GPS?

4 + (2 + 2 + 4) = 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

B.TECH/CE/3RD SEM/CIVL 2101(BACKLOG)/2019

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) If the QB of a survey line is S43˚30'E, what will be the WCB?
(a) 45˚30' (b) 55˚30' (c) 133˚30' (d) 136˚30'.

(ii) 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˚.

(iii) If the BB of a survey line is S40˚15'E, what will be the corresponding FB?
(a) S40˚15'W (b) N40˚15'W
(c) N39˚45'W (d) S50˚45'W.

(iv) 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˚.

(v) The line joining points of equal elevation is known as a
(a) Horizontal line (b) Contour line
(c) Level line (d) Tangent line.

(vi) Which of the following accessories is not used in plane table surveying?
(a) Alidade (b) Trough compass
(c) Prismatic compass (d) Plumbing fork.

(vii) In Simpson's formula, the number of ordinates cannot be taken as
(a) 8 (b) 9 (c) 10 (d) 12.

(viii) The BM established by the Survey of India is known as the
(a) permanent BM (b) GTS BM
(c) arbitrary BM (d) temporary BM.

(ix) The distance formula for finding distances using a theodolite, for a horizontal line of sight, is
(a) Ks + C (b) K + Cs (c) K/s + C (d) K + C/s.

(x) The global positioning system operated by the us department of defence uses
(a) 6 satellites (b) 12 satellites
(c) 18 satellites (d) 24 satellites.

Group – B

2. (a) What is a three-point problem? Explain with a neat sketch the procedure of solving a three-point problem in plane table surveying.

(b) A 30 m long tape was standardized at 20°C and under a pull of 100 N. The tape was used to measure a distance AB when the temperature was 45°C and the pull was 150 N. The tape was supported at the ends only. Find the corrections per tape length if the cross section of the tape was 4 mm^2, the unit weight of the tape material is 0.0786 N/mm^3, and the coefficient of thermal expansion of the tape material is 11.5 × 10^{-6}/°C and E = 2,000,000 kN/m^2.

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 fore and back bearings of the sides of a closed traverse. Calculate the interior angles of the traverse.

Line	Fore Bearing	Back Bearing
AB	150°15'	330°15'
BC	20°30'	200°30'
CD	295°45'	115°45'
DE	218°00'	38°00'
EA	120°30'	300°30'

(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 10 m:
3.250, 2.235, 1.125, 0.850, 3.125, 2.760, 1.835, 1.470, 1.955, 1.225, 2.40 and 3.035.
The first reading was at a chainage of 45 m where, the RL is 97.085. The instrument was shifted after the fourth and ninth readings. Find the RL of all points by Rise-and-Fall method.

(b) What are the characteristics of contour lines?

8 + 4 = 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°30' 75°30'	4°30' 10°15'	1.150,1.750,2.35 1.250,2.000,2.750	RL of O = 150.00

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

8 + 4 = 12

Group – D

6. (a) The following offsets were taken at 10 m intervals from a survey line to an irregular boundary line:
0, 2.50, 3.80, 5.00, 4.70, 3.20, 0m
Find the area enclosed between the survey line, the irregular boundary line, first and last offsets by:
(i) The trapezoidal rule
(ii) Simpson's rule.

(b) The two-level sections shown in Fig.1 are constant over a length of 120 m. Find the volume of earthwork in this length.

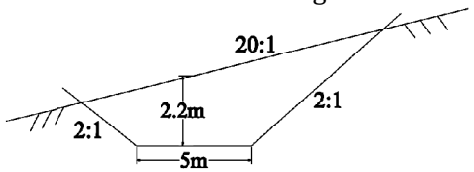

Fig.1

8 + 4 = 12

7. (a) A curve is designated as a 3° curve (20 m arc). The deflection angle is 38°. 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) Describe the locating of sounding by one angle from shore and one angle from boat method with neat sketch.