

310305

Roll No. 18EMCCED72

Total No of Pages: 4

310305

B. Tech. III - Sem. (Main) Exam., Dec. - 2019

Civil Engineering
3CE4-05 Surveying

Time: 3 Hours

Maximum Marks: 120

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 10×2 marks = 20 marks. All ten questions are compulsory.

Part – B: Analytical/Problem Solving questions 5×8 marks = 40 marks. Candidates have to answer five questions out of seven.

Part – C: Descriptive/Analytical/Problem Solving questions 4×15 marks = 60 marks. Candidates have to answer four questions out of five.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting materials is permitted during examination. (Mentioned in form No. 205)

1. NIL

2. NIL

PART - A

- Q.1 What is tachometry surveying? [2]
- Q.2 State the use of vertical clamp and vertical tangent in theodolite? [2]
- Q.3 State the transit rule for balancing traverse? [2]
- Q.4 State the difference between contour interval and horizontal equivalent? [2]
- Q.5 What are the usual ways of designing the curve? [2]

[310305]

Page 1 of 4

[2040]

- Q.6 State any expression for finding the length of a transition curve? [2]
- Q.7 What is the principle of E.D.M (Electronic Distance Measurement)? [2]
- Q.8 Define WCB (Whole Circle Bearing) and QSB (Quadrantal System of Bearing)? [2]
- Q.9 Define Datum scale and Average Scale in Photogrammetry Surveying. [2]
- Q.10 Write two advantage of Total station. [2]

PART – B

- Q.1 Two distances of 30 and 100 meters were accurately measured out and the intercepts on the staff between the outer stadia webs were 0.186m at the former distance and 0.999 at the latter. Calculate the tachometric constants. [8]
- Q.2 Two parallel railway lines are to be connected by a reverse curve, each section having the same radius. If the lines are 12 meters apart and the maximum distance between the tangent points measured parallel to the straights is 48 meters, find the maximum allowable radius. If however, both the radii are to be different, calculate the radius of the second branch if that of the first branch is 60 meters. Also, calculate the lengths of the branches. [8]
- Q.3 A transition curve is to be designed for the following data: [8]
- (i) Radius of the circular curve = 300m
 - (ii) Gauge = 1.5m
 - (iii) Maximum super elevation = 15 cm
 - (iv) No lateral pressure on rails
 - (v) Rate of gain of radial acceleration = 0.3 m/ sec^3

Find the length of curve and design speed.

- Q.4 A 20 m chain was found to be 10cm too long after chaining a distance of 1500 m. It was found to be 18cm too long at the end of the day's work after chaining a total distance of 2900m. Find the true distance if the chain was correct before the commencement of the work. [8]
- Q.5 A level set up on extended line BA in a position 70 meters from A and 100 meters from B reads 1.684 on a staff held at A and 2.122 on a staff held at B, the bubble having been carefully brought to the center of its run before each reading. It is known that the reduced levels of the tops of the pegs A and B are 89.620 and 89.222 respectively. Find the collimation error, and the readings that would have been obtained had there been no collimation error. [8]
- Q.6 In an anticlockwise traverse ABCA, all the sides were equal. Magnetic for bearing of side BC was obtained as $20^{\circ} 30'$. The bearing of sun was also observed to be $182^{\circ}20'$ at the local noon, with a prismatic compass. Calculate the magnetic bearings and true bearings of all the sides of the traverse. Tabulate the results and draw a neat sketch to show the bearings. [8]
- Q.7 The following bearings were observed in running a closed traverse: [8]

Line	F.B	B.B
AB	$71^{\circ}05'$	$250^{\circ}20'$
BC	$110^{\circ}20'$	$292^{\circ}35'$
CD	$161^{\circ}35'$	$341^{\circ}45'$
DE	$220^{\circ}50'$	$40^{\circ}05'$
EA	$300^{\circ}50'$	$121^{\circ}10'$

Determine the correct magnetic bearings of the lines.

PART – C

- Q.1 Derive an expression for correction to be made for the effects of sag and slope in base measurement, introducing the case where the tape or wire is supported at equidistant points between measuring pegs or tripods. [15]
- Q.2 What are the objectives and conditions for the introduction of a transition curve in transportation? Derive an expression for the length of transition curve by rate of change of radial acceleration. [15]
- Q.3 Describe the conditions under which tachometric surveying is advantageous. Derive the fundamental equation of tangential tachometry. [15]
- Q.4 Explain principle and types of E.D.M [15]
- Q.5 What do you understand by direct and indirect methods of contouring? How is the interpolation done? [15]
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