Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem Examination Dec-2023

CE3CO01 Engineering Surveying

Programme: B.Tech. Branch/Specialisation: CE

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. If one of the vernier is at 0° then another vernier reading shows/also shows _____. **1**

(a) 90° (b) 0° (c) 180° (d) 45°

ii. When the angular measurements of a traverse are more precise than the linear measurements, the balancing of a traverse is done by- **1**

(a) Bowditch's rule (b) Transit rule

(c) Empirical rule (d) Any one of these

iii. In fixed hair method of tacheometry, the distance between _____ hairs are fixed. **1**

(a) Upper and central

(b) Central and lower

(c) Upper and lower

(d) Lower, central and upper

iv. Distance and elevation formulae for fixed hair method assuming the line of sight as horizontal and considering an external focusing type telescope is D = Ks + C. where C is _____. **1**

(a) f/I (b) i/f (c) f + d (d) f – d

v. Which of the following is the formula for setting out a curve by method of perpendicular offset from long chord? **1**

(a) $O_x = (R^2 + x^2)^{1/2} – (R - O_0)$

(b) $O_x = (R^2 - x^2)^{1/2} – (R - O_0)$

(c) $O_x = (R^2 - x^2)^{1/2} + (R - O_0)$

(d) $O_x = (R^2 + x^2)^{1/2} – (R + O_0)$

P.T.O.

vi. The formula for length of the curve can be given as- **1**
(a) $L = R\Delta\pi/180$ (b) $L = R + \Delta$
(c) $L = R * \tan(\Delta/2)$ (d) $L = R / \Delta$

vii. To observe an included angle with better accuracy, you will prefer the method of- **1**
(a) Repetition (b) Reiteration
(c) Double observations (d) Both face observation

viii. Normal tension is that pull which- **1**
(a) Is used at the time of standardising the tape
(b) Neutralizes the effect due to pull and sag
(c) Makes the correction due to sag equal to zero
(d) Makes the correction due to pull equal to zero

ix. The point where a vertical line through the optical centre of the camera lens intersects the ground is known as- **1**
(a) Ground principal point (b) Ground plumb point
(c) Iso-centre (d) Perspective centre

x. Sounding in hydrography is defined as the- **1**
(a) Distance travelled by sound waves in a water body
(b) Measurement of depth of the water body at the point of measurement
(c) Difference of gauge reading and water level at the time of observation
(d) All of these

Q.2 i. What is error of closure? How is it balanced mathematically? **3**

ii. The table below gives the lengths and bearings of the lines of a traverse ABCDE the length and bearing of EA having been omitted. Calculate the length and bearing of the line EA. **7**

Line	Length	Bearing
AB	204.0	87°30’
BC	226.0	20°20’
CD	187.0	280°0’
DE	192.0	210°30’
EA	?	?

OR iii. Explain direct method of traversing without transiting. **7**

Q.3 i. What is a subtense bar? Give its theory. **3**

ii. Two distances of 50 and 80 m were accurately measured out, and the intercepts on the staff between the outer stadia hairs were 0.496 m at the former distance and 0.796 at the latter. Calculate the tacheometric constants. **7**

OR iii. The elevation of a point P is to be determined by observations from two adjacent stations of a tacheometric survey. The staff was held vertically upon the point, and the instrument is fitted within an anallactic lens the constant of the instrument being 100. Compute the elevation of the point P from the following data: **7**

St.	Height of axis	Staff Point	Vertical Angle	Staff Reading
A	1.42	P	$+2^0 24’$	1.230,2.055,2.880
B	1.40	P	$-3^0 36’$	0.785,1.800,2.815

R.L. of A is 77.750m and R.L. of B is 97.135m.

Q.4 i. Define point of intersection, point of tangency, tangent distance and right-hand curve. **4**

ii. Derive formula for setting out a simple circular curve by ordinates from the long chord. **6**

OR iii. Derive formula for setting out a simple circular curve by radial offsets from the tangents **6**

Q.5 i. Define active and passive remote sensing. **3**

ii. Describe a method of extending a base line and explain its necessity. **7**

OR iii. A steel tape 20 m long standardised at 55 °F with a pull of 10 kg was used for measuring a base line. Find the correction per tape length, if the temperature at the time of measurement was 80 °F and the pull exerted was 16 kg. Weight of 1 cubic cm of steel = 7.86 g, Weight of tape = 0.8 kg and $E= 2.109*10^6$ kg/cm^2. Coefficient of expansion of tape per 1 °F = $6.2*10^{-6}$. **7**

Q.6 Attempt any two:

i. Define exposure station, principal point, altitude, vertical photograph, tilted photograph. **5**

ii. Describe any two methods of locating sounding. **5**

iii. Describe echo sounding. **5**

******