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Question Paper Code: 53016

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Third Semester

Civil Engineering

15UCE306 - SURVEYING

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Main principle of surveying is to work from
 - (a) higher level to lower level
 - (b) lower level to higher level
 - (c) part to the whole
 - (d) whole to the part
2. Levelling is the branch of surveying its deals with
 - (a) To find the elevations
 - (b) To find the vertical angles
 - (c) To find the horizontal angles
 - (d) None of these
3. Theodolite is an instrument used for
 - (a) measurement of bearings only
 - (b) measurement of vertical angles only
 - (c) measurement of horizontal angles only
 - (d) all the above
4. The purpose of an anallactice lens in a tacheometer is to
 - (a) Increase the magnification
 - (b) reduce the effective length of the telescope
 - (c) to eliminate multiplying constant
 - (d) make staff intercept proportional to its distance from the tacheometer
5. The long chord and tangent length of a circular curve of radius R will be equal if the angle of deflection is
 - (a) 30°
 - (b) 60°
 - (c) 120°
 - (d) 150°

PART - B (5 x 3 = 15 Marks)

6. Write the use of line ranger.
7. Distinguish between backsight and foresight.
8. Write short note on “ Dumpy Level”.
9. What are the uses of subtense bar?
10. List the various methods of setting out a simple circular curve.

PART - C (5 x 16 = 80 Marks)

11. (a) Following are the bearings taken in a closed compass traverse

Line	F.B.	B.B.
AB	S37°30'E	N37°30'W
BC	S43°15'W	N44°15'E
CD	N73°00'W	S72°15'E
DE	N12°45'E	S13°15'W
EA	N60°00'E	S59°00'W

Compute the interior angles and correct them for observational errors.

(16)

Or

- (b) A line was measured with a steel tape which was exactly 30 m at a temperature of 20°C and a pull of 10 kg. The measured length was 1650 m. The temperature during measurement was 300°C and the pull applied was 15 kg. Find the true length of line, if the cross-sectional area of the tape was 0.025 cm². The coefficient of expansion of the material of the tape /° C is 3.3x10⁻⁶ and modulus of elasticity of the material of the tape is 2.1x 10⁶ kg/cm².

(16)

12. (a) The following consecutive readings were taken with a level and 4.0m staff on continuously sloping ground at a common interval of 30 m : 0.780, 1.535, 1.955, 2.430, 2.985, 3.480, 1.155, 1.960, 2.365, 3.640, 0.935, 1.045, 1.630, and 2.545. The R.L. of the first point A was 180.750 m. Rule out a page of a level field book and enter the above readings. Calculate the reduced levels of the points by the collimation system and the rise and fall system. Also calculate the gradient of the line joining the first and the last points.

(16)

Or

- (b) Describe the collimation method of reducing the levels. Compare the collimation method with the rise and fall method.

(16)

13. (a) Describe the temporary adjustments of a theodolite. How would you change face? What instrumental errors are eliminated by face left and face right observations? (16)

Or

- (b) The following observations were made for a closed traverse round an obstacle. Due to obstructions, length of lines DE and EA could not be measured. Find out the missing lengths.

Line	Length (m)	Bearing
AB	500	98°30'
BC	620	30°20'
CD	468	298°30'
DE	?	230°00'
EA	?	150°10'

(16)

14. (a) To determine the elevation of station P in a tacheometric survey, the following observations were made with the staff held vertical. The instrument was fitted with an anallactic lens and its multiplying and additive constant were 100 and 0 respectively.

Int. Station	H.I (m)	Staff Station	Vertical angle	Staff reading (m)		
O	1.45	B.M	-6°00'	1.335	1.895	2.460
O	1.45	C.P	+8°30'	0.780	1.265	1.745
P	1.40	C.P	-6°30'	1.155	1.615	2.075

If R. L. of B.M. is 250 m, calculate R. L. of P. (16)

Or

- (b) The following readings were taken by tacheometer with the staff held vertical. The tachometer is fitted with an anallactic lens and the multiplying constant is 100. Find out the distance from A and B and the R.L. of B. (16)

Int. Station	Staff Station	Vertical angle	Staff reading (m)			Remarks (m)
	B.M	-6°00'	1.100	1.153	2.060	R.L. of B.M.
A	B	+8°00'	0.982	1.105	1.188	= 976.00.

15. (a) Two straights AB and BC intersect at chainage of 4242.0m. The angle of intersection is 140° . It is required to set out a 5° simple circular curve to connect the straights. Calculate all the data necessary to set out the curve by the method of offsets from the cord produced with an interval of 30 m. (16)

Or

- (b) What is a transition curve? State the various types of transition curves with the help of a neat sketch. Explain briefly its necessity. (16)
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