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BOARD DIPLOMA EXAMINATION, (C-16)

AUGUST/SEPTEMBER—2021

DCE - THIRD SEMESTER EXAMINATION

SURVEYING - II

Time : 3 hours] [*Total Marks* : 80

PART—A

3×10=30

Instructions : (1) Answer all questions.

(2) Each question carries three marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Mention any six component parts of a theodolite.

2. Define the following terms with reference to the theodolite surveying :

   (a) Line of collimation

   (b) Centering

3. State any three relationships between fundamental lines of a theodolite.

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4. Name the instruments used in trigonometric levelling and state their functions.

5. Determine RL of top of the tower, when the vertical angle measured to the top of the tower was 30°45'0''. The theodolite was set up at a distance of 50 m from its base. The RL of line of collimation was 148·175 m.

6. What is tacheometric surveying? State its main purpose.

7. State the principle of tacheometry with a neat sketch.

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8. Draw a neat sketch of a circular curve and show the following notations :

(a) Back tangent

(b) Point of intersection

(c) Angle of deflection

(d) Long chord

9. The intersection angle between two straight lines AB and BC is 140°. Calculate radius and length of the circular curve connecting the two lines, if D = 6°.

10. State three functions of total station.

PART—B

Instructions : (1) Answer *any* five questions.

(2) Each question carries ten marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. Explain in detail the measurement of horizontal angle by using the method of repetition with a theodolite. Also draw the appropriate tabular form for recording the observation. 7+3

12. State the errors in theodolite survey. 10

13. Find the elevation of the top of church spire A from the following data with a neat sketch : 10

INST. STATION	SIGHT TO	VERTICAL ANGLE	REMARKS
B	A	+25°23'	Staff reading on BM = 1·35 m
C	A	+ 16°40'	Staff reading on BM = 1·225 m

RL of BM = 152·26 m and distance between B and C = 30 m.

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14. A tacheometer was setup at station A and the following readings were obtained on a vertically held staff : 10

Calculate the horizontal distance from A to B and the RL of B, if the constants of instruments were 110 and 0·4.

INSTRUMENT STATION	STAFF STATION	VERTICAL ANGLE	CROSS HAIR READINGS (m)	REMARKS
A	BM	–2°18'	3·225, 3·550, 3·875	RL OF BM = 437·655
A	B	+8°36'	1·65, 2·515, 3·38	—

15. The following tachometric observations were made with annallatic telescope having a multiplying constant 100 on a vertically held staff : 10

Inst. Station	Height of Inst. (m)	Staff Station	Vertical Angle	Cross Hair Readings (m)
A	1·48	BM	–1° 54'	1·02, 1·72, 2·42
P	1·48	P	+2° 36'	1·22, 1·825, 2·43
Q	1·50	P	+3° 06'	0·785, 1·61, 2·435

If RL of BM is 100, find the RLs of stations A, P and Q.

16. Determine the offsets from tangents at intervals of 20 m to locate 400 m radius circular curve by *(a)* radial offsets method and *(b)* perpendicular offsets method. Assume deflection angle = 30°. 5+5

17. Describe the method of setting out a circular curve using two theodolites method (deflection angles) with a neat sketch. 10

18. Explain how closed traversing is done using total station with a neat sketch. 10

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