Question Paper

Exam Date & Time: 01-Jun-2018 (09:30 AM - 12:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES IV SEMESTER B.S. DEGREE MAKE-UP EXAMINATION-MAY/JUNE 2018 DATE: 1 JUNE 2018 TIME: 9.30 AM TO 12.30 PM Surveying [CE 246]

Marks: 100

Duration: 180 mins.

Answer 5 out of 8 questions. Assume any missing data suitably

- List out any four differences between direct and indirect (10) methods of contouring.
 - B) A theodolite was set up at point I and the reading on a BM ⁽¹⁰⁾ of RL 1583.55m was 1.875m. The staff was then held at two stations P and Q and the vertical angle of depression readings on the staff at the 4m mark were 4⁰ 30' and 7⁰ 34' 30" respectively. The distances between the instrument and the stations P and Q were 300m and 500m, respectively. Find the RLs of the station points P and Q.
- ²⁾ Fill the missing figures and complete the level book. Apply ⁽¹⁰⁾ usual check.

A)

Station	BS	IS	FS	HI	RL	Remark
1	1.175			X	100.000	BM
2		X			98.975	
3		1.47			Х	
4	2		Х	X	98.100	х
5		1.9			Х	
6		X			97.200	
7	3.5		2.5	101.1	97.600	х
8			2.65		Х	

^{B)} What is sensitiveness of bubble tube? Derive and Explain ⁽¹⁰⁾ field procedure for finding sensitiveness of bubble tube.

- What is surveying? What are the principles of surveying? ⁽¹⁰⁾
 Explain the divisions of surveying.
 - ^{B)} With a neat sketch explain the elimination of error due to ⁽¹⁰⁾ curvature and refraction by reciprocal levelling. Explain temporary adjustment of theodolite.
 - A)
 A)
 Derive height and distnce formula using single plane and (10) double plane method when the Base of the object inaccessible.

4)

^{B)} Two sets of tacheometric readings were taken from two (10) instruments (P & Q). Readings taken from instrument station A (RL = 100.00m) to a staff station B are shown below:

Instruments	Р	Q
Multiplying constant	100	95
Additive constant	0.30	0.45
Height of instrument	1.40m	1.45m
Staff Held	Vertical	Normal

Instrument	Instrument station	Staff station	Vertical angle	Stadia r	readings
Р	А	В	5∘44′	1.090, 1.795	1.440,
Q	А	В	5∘44′	?	??

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Determine:

The distance between instrument station and staff station and The RL of staff station B.

Stadia Readings with instrument Q.

With the neat sketch derive an expression for horizontal (10)and vertical distances for all the cases using tangential A) method.

(10)B) Determine the value of stadia constants for the following observations with the horizontal line of sight.

instrument	Staff reading	Distance	Stadia reading		
		(m)	Upper	Lower	
	А	150	1.255	2.750	
0	В	200	1.000	3.000	
	С	250	0.750	3.255	

6)

- (10)Two straights intersecting at an angle of 60°. Calculate all the data necessary to set out the Bernoulli's Lemniscate A) Curve, at least 10 points are to be marked on the ground for setting out curve, if the apex distance is 25m.
- B) Explain the principle of EDM and write a short note on (10)Computing distance from the phase difference method in EDM.
- 7) With neat sketch explain the elements of simple circular (10)curve and write equations to find there lengths. A)
 - B) Derive an expression for calculating the various elements (10)of Reverse curve connecting two parallel straights, with a neat sketch. Given two Radii R₁ and R₂ and the central angles $\triangle 1$ and $\triangle 2$.

Calculate all the elements of a simple circular curve having degree of curve 9° and deflection angle is 65° .

What is super elevation? Derive an equation for finding (10)8) length of transition curve by rate of super elevation, by A) time rate and by rate of change of radial accleration.

5)

^{B)} Explain the method of calculation and field procedure involved in setting out simple circular curve using Rankine's Method.

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