Question Paper

Exam Date & Time: 22-Nov-2018 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES III SEMISTER B.Sc EXAMINATION NOV 2018 SURVEYING [ICE 234 - S2]

Marks: 100

Duration: 180 mins.

Answer 5 out of 8 questions.

Write the difference between simple levelling and (10) differential levelling.
 A) Define (a)Station (b) Intermediate sight (c) Level surface. Explain curvature and refraction with the help of figure and write the expression for corrections.

^{B)} The following figures were extracted from a level field ⁽¹⁰⁾
 book, some of the entries being illegible owing to exposure to rain. Insert the missing figures and check your results. Rebook all the figures by the rise and fall method.

Station	B.S	I.S	F.S	Rice	Fall	R.L	Remarks
1	2.285					232.460	B.M.1
2	1.650		Х	0.020			
3		2.105			Х		
4	Х		1.960	х			
5	2.050		1.925		0.300		
6		Х		х		232.255	B.M.2
7	1.690		Х	0.340			
8	2.865		2.100				
9			Х	Х		233.425	233.425

²⁾ Compare Rise and fall Method and height of Collimation ⁽¹⁰⁾
 ^{A)} method.

Define Horizontal Equivalent in the case of Contour. Explain any two methods of contouring.

^{B)} The following notes refer to reciprocal levels taken with one ⁽¹⁰⁾ level. Find

(a)True R.L. of Q,(b) The combined correction for curvature and refraction and (c) The angular error in the collimation adjustment of the instrument.

(b)What will be the difference in answers of (a) and (c) if observed staff readings were 2.748 on P and 1.824 on Q, The instrument being at P; and 1.606 on P and 0.928 on Q, The instrument being at Q.

Inst. at Staff readings on

P Q Distance R.L. of P	PQ=1010m, P=126.386
P 1.824 2.748	
Q 0.928 1.606	

3)

- A) Draw a schematic diagram a Theodolite and show Trunnion ⁽¹⁰⁾ axis, Telescope, Upper plate, Lower Plate, Vertical axis, Plumb bob, Lower clamp, Upper clamp, Vertical Circle, Tripod.
- ^{B)} Write an expression to find R.L. of a point, when base of the ⁽¹⁰⁾ object is inaccessible and instrument stations are not in the same vertical plane as the elevated object. In order to ascertain the elevation of the (Q) signal on a hill ,observations were made from two instrument stations P and R at a horizontal distance 100 meters apart, The stations P and R being in line with Q. The angles of elevation of Q at P and R were 28⁰42'and 18^o6' respectively. The staff readings upon the benchmark of elevation 287.28 m., were respectively 2.870 and 3.750, when the instrument is at 'P' and at 'R', the telescope being horizontal. Determine the elevation of the
 - foot of the signal, if the height of signal above its base is 3 meters.
- ⁴⁾ Explain by the help of figures.(a)Stake(b) Post (c)Boning (10)
 rod(d)Batter Board (e) Travelling rod.
 - ^{B)} With a neat diagram explain the methods of setting out ⁽¹⁰⁾ Buildings.
- ⁵⁾ What is contour? Write any 6 applications of contour map. ⁽¹⁰⁾ Write any 8 Characteristics of Contour Lines.
 - A)
 - ^{B)} Tacheometer was set up at P on top of the Summit, and the following readings were taken.

The tacheometer is fitted with anallactic lens . The multiplying

(10)

constant is 100.The staff was held vertical.Find the distance between A and B(assuming P,A,B are in same line,) and the gradients of lines PA and PB.

Height of Staff Vertical Inst,Station instrument station angle Hair readings. Remarks

P1.500A $+10^{0}0'$ 1.150, 2.050, 2.950RL of P=P1.500B $-12^{0}0'$ 0.855, 1.605, 2.355

6)

Two straights T_1I and T_2I intersect at an inaccessible point ⁽¹⁰⁾ I. Two points P and Q are selected on lines T_1I and T_2I , respectively. Length of PQ =180m. **(PQ is not a common tangent)** angle T_1PQ is 110^0 and angle PQT₂ is 130^0 . The two straights are to be joined by a curve of 500 m radius. Chainage of point P is 2500m Calculate the chainages of point of tangency (T_2), and Chainage of point of curve (T_1).

^{B)} A compound curve is made up of two arcs of radii 320 m ⁽¹⁰⁾ and 510 m.The deflection angle of the combined curve is 100⁰ and that of the first arc of radius 320 m is 54⁰.The chainage of first point is 920m.Find the chainages of point of intersection,common tangent point,and forward tangent point.

A reverse curve ACB is to be set out between two parallel (10) straights 10 m apart.If Radius are equal, and the distance between tangent points is 80 m., calculate the radius. assuming the chainage of starting point as 234 m., and using a special chain of 10m., Calculate all the data necessary to set the curve by Rankines method.

- ^{B)} Explain any 3 methods setting of simple curves with the ⁽¹⁰⁾ help of figures.
- ⁸⁾ Photographs of certain area were taken from points P and ⁽¹⁰⁾ (10) Q,two camera station ,100 m apart.The focal length of camera is 150mm.The axis of the camera makes an angle of 60^0 and 40^0 with the base line at station P and Q respectively.
 - ^{B)} Define Photogrammetry .Explain briefly about types of ⁽¹⁰⁾

photogrammetry with Principles.

-----End-----