

17419

14115

3 Hours / 100 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) Attempt any **SIX** of the following: **12**
- (i) Define contour interval and horizontal equivalent.
- (ii) Explain the importance of digital planimeter.
- (iii) Define telescope inverted and telescope normal.
- (iv) Define the term swing of telescope.
- (v) State any two object of Tacheometry.
- (vi) State any two features of digital theodolite.
- (vii) Define simple curve with sketch.
- (viii) Define interpolation of contours.

P.T.O.

b) Attempt any TWO of the following:**08**

- (i) Define any four uses of contour map.
- (ii) State the applications of Remote sensing with respect of natural hazard.
- (iii) State the procedure for measurement of deflection angle by transit theodolite.

2. Attempt any FOUR of the following:**16**

- a) Describe the stepwise procedure of interpolation of contours by arithmetic method with suitable example.
- b) State direct and indirect method of contouring? Explain tacheometric method.
- c) Describe method of locating a contour gradient.
- d) Give the desired relationships between the fundamental axis of transit theodolite.
- e) Describe the method of prolonging a straight line with transit theodolite.
- f) What is meant by consecutive co-ordinate and independent co-ordinate?

3. Attempt any FOUR of the following: 16

- a) State the four advantages of total station.
- b) Describe the temporary adjustment of micro-optic theodolite.
- c) State four component parts of digital theodolite and state their purpose.
- d) Describe the set-up of digital level.
- e) State any four application of digital theodolite.
- f) Draw a neat sketch of circular curve and show the following element.
 - (i) Tangent length
 - (ii) Deflection angle
 - (iii) Apex distance
 - (iv) Length of long chord.

4. Attempt any FOUR of the following: 16

- a) State the procedure for computing the volume by prismoidal formula.
- b) What is remote sensing? State the meaning of active and passive system.
- c) What is GPS? State any four uses of GPS.
- d) Explain in brief fixed hair method.
- e) List any four essential characters of tacheometer.
- f) What is meaning of degree of curve and long chord?

5. Attempt any TWO of the following:

16

- a) A traverse is run from A to G and the deflection angles are as follows:

At station B = $32^{\circ}16' L$, C = $18^{\circ}34' R$

D = $22^{\circ}12' L$, E = $42^{\circ}24' R$, F = $52^{\circ}42' R$

compute the bearing of the remaining line of the traverse given that the forward bearing of AB is $110^{\circ}6'$.

- b) Calculate the corrected consecutive co-ordinate for the following observations. Apply Bowditch Rule.

Line	Length (mt)	Consecutive co-ordinate			
		N	S	E	W
AB	250	107.97		3.77	
BC	123	14.39		249.57	
CD	256		122.94	4.12	
DA	108	0			256.00

- c) The following are the observation made by tacheometer with analatic lens the multiplying constant being 100 The staff was held vertical.

Inst. Station	HI	Start Station	Vertical angle	Hair reading	Remark RL of
P	1.50	B.M.	$-6^{\circ}12'$	0.965, 1.515, 2.065	B.M.
P	1.50	Q	$+7^{\circ}5'$	0.820, 1.340, 1.860	460.500m

Find RL of Q and horizontal distance PQ.

6. Attempt any TWO of the following:**16**

- a) A railway embankment 400 mt long is 12 mt wide at the formation level and has the side slope 2:1. The ground level at every 100 mt along the centre line are as under.

Distance-	0	100	200	300	400
RL-	204.8	206.2	207.5	207.2	208.3

The formation level at zero chainage is 207.00 mt and embankment has a rising gradient of 1 in 100. The ground is level across the centre line. Calculate the volume of earth work.

- b) Two tangent intersect at chainage 2140 mt the deflection angle being 36° calculate all the data necessary for setting out curve with a radius 30 mt. by deflection angle.
- c) Describe to use of digital theodolite for measurement of horizontal and vertical angle.
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