

17419

21718

3 Hours / 100 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) 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) Write the use of Gale's table.
 - (iii) State any two situations under which tacheometry is preferred.
 - (iv) List any four modern survey instruments.
 - (v) State any two advantages of total station over dumpy level and theodolite.
 - (vi) State the two methods of setting out curves.
 - (vii) State Bowditch rule.
 - (viii) State the constant of tacheometer.

P.T.O.

b) **Attempt any TWO of the following:****8**

- (i) State the application of remote sensing in various fields.
- (ii) Describe the temporary adjustment of theodolite.
- (iii) Draw a neat sketch of contour for the following.
Assume suitable contour values and show the same.
 - 1) Hill
 - 2) Valley
 - 3) Pond
 - 4) Saddle

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

- a) Define grade contour. Give the procedure to locate grade contour on contour map with suitable sketch.
- b) The following readings were recorded by a planimeter with the anchor point inside the figure $IR = 9.377$, $F.K. = 3.336$, $M = 100 \text{ cm}^2$ and $C = 23.521$. Calculate the area of the figure when it is observed that the zero marks of the dial passed the index mark once in the anticlockwise direction.
- c) Mention different sources of errors in theodolite surveying.
- d) Write four application of GIS.
- e) State four component parts of a micro-optic theodolite and state their purpose.
- f) Write any four features of total station.

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

- a) State the classification of electronic distance meter.
- b) Draw a neat sketch of simple circular curve showing all elements.
- c) Explain principle of stadia method.
- d) Enlist any six uses of contour.

- e) Write down the procedure for determination of tacheometric constant.
- f) Show the following readings on windows of micro-optic theodolite in measurement of horizontal and vertical angle.
- (i) Horizontal angle = $110^{\circ}30'15''$
- (ii) Vertical angle = $75^{\circ}25'10''$

4. Attempt any FOUR of the following: 16

- a) What is meant by zero circle? State the advantages of digital planimeter over polar planimeter.
- b) Enlist the advantages and disadvantages of total station.
- c) Explain the setting of curve by Rankine's deflection angle method.
- d) Differentiate between active system and passive system of remote sensing.
- e) Derive the relation between radius and degree of curve.
- f) Points P and Q are two ground points at a distance of 10 m with their reduced levels 45.50 and 47.50 m respectively. Interpolate the contours of 46 and 47 m between P and Q.

5. Attempt any TWO of the following: 16

- a) An incomplete traverse table is obtained as follows:

Line	Length (m)	Bearing
AB	100.00	?
BC	80.50	$140^{\circ}30'$
CD	60.00	$220^{\circ}30'$
DA	?	$310^{\circ}15'$

Calculate the length of DA and bearing of AB.

- b) Explain sources of error in Theodolite.

- c) A tacheometer was set up at station A and following readings were taken on a staff held vertically.

Instrument station	Staff station	Vertical Angle	Hair Reading	Remark R.L. of B.M. = 500 m
A	B.M.	8°	1.050, 1.105, 1.160	
A	B	-5°	0.950, 1.055, 1.160	
The constant of instrument was 100. The instrument was fitted with anallatic lens calculate the distance AB and R.L. of B.				

6. Attempt any TWO of the following:

16

- a) Two tangents AB and BC intercept at a point B at 150.5 m chainage. Calculate all the necessary data for setting out a circular curve of 100 m radius and deflection angle 30° by the method of offsets from the long chord.
- b) Find the quantity of water from the contour map of a reservoir the following contour areas were recorded by planimetered the top water level is 200 m and lowest point in the reservoir is 180 m.

Contour (m)	200	195	190	185	180	175
Area in m ²	3850	3450	2600	800	450	200

- c) Describe the use of digital theodolite for measurement of horizontal and vertical angle.
