

# 17419

**21819**

**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:
    - 1) Contour interval
    - 2) Horizontal equivalent
  - (ii) State any two uses of contour map.
  - (iii) Define zero circle.
  - (iv) Define the terms, swinging and transiting.
  - (v) Define axis of telescope and horizontal axis.
  - (vi) State any two situations where tacheometry is used.
  - (vii) State any two features of digital level.
  - (viii) State any two methods of setting out curve.

P.T.O.

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

8

(i) Draw a neat sketches of contour for following:

- 1) Ridge line
- 2) Valley line
- 3) Steep slope
- 4) Depression

(ii) Define Remote sensing. State the meaning of active and passive system.

(iii) State the procedure for measurement of vertical angle by transit theodolite with suitable sketch.

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

16

- a) State the method of contour interpolation and explain any one.
- b) State any four fundamental characteristics of contour line.
- c) Describe the procedure to locate grade contour in a field.
- d) State different relationship between fundamental axis of theodolite.
- e) Describe the procedure for measuring magnetic bearing by transit theodolite with suitable sketch.
- f) State any four uses of theodolite.

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

16

- a) List any four modern surveying instruments.
- b) Discuss any four advantages of total station over dumpy level.
- c) State any four component parts of digital level and state their purpose.
- d) State any four application of digital theodolite.
- e) Describe the procedure to setup total station.
- f) Draw a neat sketch of circular curve and show all the element.

4. Attempt any FOUR of the following:

16

- a) The following readings were obtained when a figure was traversed using a planimeter in clockwise direction with anchor point outside and with tracing arm set to the natural scale ( $M = 100 \text{ sq. cm}$ ) The zero mark of the disc passed the fixed index mark once in the clockwise (positive) direction  $IR = 9.625$  and  $FR = 1.224$ . Calculate the area of the figure.
- b) State the practical application of remote sensing in civil engineering field.
- c) State any four application of GIS.
- d) Explain principle of tacheometry with suitable sketch.
- e) State any four characteristic of tacheometer
- f) Give classification curve and define:
  - (i) Transition curve
  - (ii) Reverse curve

5. Attempt any TWO of the following:

16

- a) The following data was collected in connection with a closed traverse PQRSP.

Line	Length (m)	Bearing
PQ	780	$133^\circ 45'$
QR	2000	$32^\circ 24'$
RS	390	$340^\circ 00'$
SP	?	?

Calculate the missing length of SP and bearing of SP.

- b) Calculate independent co-ordinates from following data showing calculations.

Line	Latitude		Departure	
	N	S	E	W
AB		182.63	313.12	
BC	244.72		470.12	
CD	495.17			318.34
DE		268.70		388.46
EA		288.27		113.34

- c) A tacheometer fitted with anallatic lens was setup at station O and the following reading were taken on staff held vertical.

Inst . St.n	Staff St.n	Vertical Angle	Stadia Reading
O	BM	+7° 30'	0.900 , 1.200 , 1.500
O	B	-2° 30'	1.100, 1.350 , 1.600

Find the horizontal distance 'OB' and RL of 'B' if RL of BM is 50.000 m. Take the constant as 100.

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

**16**

- a) The area enclosed by the contours in a lake are follows:

Contour (m)	250	255	260	265	270
Area (m <sup>2</sup> )	2080	8500	16500	25200	33700

Calculate the volume of water between 250 m and 270 m by.

- (i) Trapezoidal formula
  - (ii) Prismoidal formula
- b) State any four features and any four applications of total station.
- c) Calculate the ordinates on long chord at 5 m interval for a circular curve at radius zoom and long chord of 60 m.