

22301

22223

3 Hours / 70 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) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following: **10****
- a) Draw labelled sketch of simple Alidade.
 - b) State any four uses of Theodolite.
 - c) Define Telescope normal and Telescope inverted.
 - d) State principle of Tachometer.
 - e) Define transition curve.
 - f) List any four components of EDM.
 - g) State use of sensor in Remote sensing.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) State the function of following accessories in plane table survey.
 - i) 'U' fork.
 - ii) Trough compass
 - iii) Level tube
 - iv) Alidade
 - b) List fundamental lines and axis of Theodolite with their relationships.
 - c) State essential requirements of tachometer.
 - d) Explain with sketches types of Horizontal curves.
- 3. Attempt any THREE of the following:** **12**
- a) Explain with observation table measurement of horizontal angle by Repetition method.
 - b) List the technical specifications of Micro optic Theodolite. (Wild T-1)
 - c) State any eight practical applications of Total stations.
 - d) Explain with sketch principle of Remote sensing.

4. Attempt any THREE of the following:

12

- a) Explain with sketch intersection method of plane table survey.
- b) Following are the lengths and bearing of traverse ABCD.

Line	Length (m)	Bearings
AB	250	30°
BC	320	140°
CD	180	210°

Find the length and bearing of the line DA.

- c) The interior angles of closed traverse PQRST are as follows:
 $\angle P = 78^\circ 40' 15''$
 $\angle Q = 104^\circ 45' 20''$
 $\angle R = 85^\circ 35' 40''$
 $\angle S = 150^\circ 40' 30''$
 $\angle T = 120^\circ 18' 15''$

If the bearing of line PQ is $220^\circ 25' 30''$, find bearings of remaining sides with usual check.

- d) Two straights AB and BC intersect at chainage 1900 m. The intersecting angle being 120° . Calculate the radius and chainage of tangent points of circular curve. The degree of curve is 6° .
- e) Determine Tachometric constants from following observations.

Inst. Stn.	Staff Station	Distance	Staff Reading	
P	B	100 m	2.530	1.520
	C	150 m	2.000	0.605

5. Attempt any TWO of the following:**12**

- a) Calculate the consecutive co-ordinates of all survey lines of following traverse.

Line	WCB	Legth (m)
PQ	121° 30'	161.20
QR	18° 9'	141.38
RS	218° 31'	201.39
SP	332° 27'	121.21

- b) Explain temporary adjustments of Transit Theodolite.
- c) The Tachometer was setup at intermediate point of line PQ and the observations are as below:

Staff St ⁿ	Vertical angle	Staff intercept	Axial hair reading
P	+8° 36'	2.35	2.105
Q	+6° 36'	2.35	1.895

The constants are 100 and 0.20. RL of station P is 420.000 m, find distance PQ and RL of station Q.

6. Attempt any TWO of the following:**12**

- a) State the stepwise procedure for setting out building using total station.
- b) Explain procedure of measurement of horizontal angles in closed traverse using Digital Theodolite.
- c) State any six applications of GIS in Civil Engineering.
