22301

24225

3 Hours / 70 Marks   Seat No.

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answer 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.   Attempt any FIVE of the following: **10**

a) State the uses of Alidade in plane table surveying.

b) Define swinging the telescope.

c) Enlist any eight components of transite theodolite.

d) State the constants of tacheometer.

e) Sate the relation between degree of curve and radius of curve for unit chord of 30 m.

f) State four advantages of total station.

g) State the practical applications of remote sensing in civil engineering project.

P.T.O.

2. **Attempt any THREE of the following:** **12**

a) Explain any one method of orientation in detail.

b) Explain intersection method of plane table surveying

c) Explain the procedure of measuring deflection angle using transit theodolite.

d) Give the four desired relationship between the fundamental axis of transit theodolite.

3. **Attempt any THREE of the following:** **12**

a) Following readings were obtained on a vertically held staff with a tacheometer (line of sight being horizontal)

Horizontal distance	Stadia reading
50 m	1.900, 1.655, 1.400
75 m	2.200, 1.725, 1.230

Determine constants of tacheometer.

b) State four component parts of digital theodolite and state their purpose.

c) Explain the procedure for measuring vertical angle by electronic distance meter.

d) Define GPS, GIS and give any two components of GPS and GIS.

4. **Attempt any THREE of the following:** **12**

a) Following are the co-ordinates of point.

A and B. Find length and bearing of line AB.

Station	Northing	Easting
A	700	605
B	620	430

b) Two straights meet at an angle of intersection of 150° at a chainage of 1500 m. Taking radius of curve as 250 m, calculate of second tangent point.

c) Explain working principle of EDM with neat sketch.

d) Differentiate between active system and passive system of remote sensing.

e) i) State what errors will be eliminated by repetition method.

ii) State the object of remote sensing.

Marks

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

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

At station B = 32° 16'L;   C = 18°34'R;

D = 22°12'L;   E = 42°24'R;   F = 52°42'R.

The bearing of line AB is 110°6', calculate bearing of remaining sides.

b) Following table gives lengths and bearings of four sides of a five sided closed traverse PQRST. Calculate length and bearing of TP.

Line	PQ	QR	RS	ST	TP
Length (m)	194.0	201.20	164.40	173.20	?
WCB	85°30'	15°30'	285°30'	195°30'	?

c) A tacheometer fitted with anallatic lens was set up at station 'P' and the following observations were recorded with a staff held vertical.

Inst. Station	Staff Station	Vertical Angle	Staff Reading		
P	B.M.	−12°42'	0.220	1.000	1.780
P	Q.	+9°36'	0.415	1.240	2.065

The reduced level of BM is 400 m. The constant of tacheometer are 100 and 0. Find the horizontal distance 'PQ' and RL of station Q.

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

a) Calculate latitudes and departments of survey lines of closed traverse "PQRS" from given length and bearings. Also calculate independent co-ordinates.

Line	WCB	Length in (cm.)
PQ	121° 30'	161.20
QR	18° 09'	141.38
RS	218° 31'	201.39
SP	332° 27'	121.21

Marks

b) Two straights intersects at chainage of 1200 m with deflection angle of 30°. Calculate the data necessary to set out curve of radius 250 m by Rankine's method of deflection angle.

c) Apply knowledge of total station to prepare a contour map by describing its procedure.

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