17419

21314

3 Hours / 100 Marks Seat No. | | | | | | | | |

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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) **Attempt any <u>SIX</u> of the following:** **12**

i) Define contour interval and horizontal equivalent.

ii) Draw contours of Valley and Ridge line.

iii) List any four components of polar planimeter.

iv) Define consecutive co-ordinates.

v) What is anallatic lens?

vi) List any four modern surveying instruments.

vii) Define degree of curve.

viii) Define passive and active sensors.

Marks

b) **Attempt any <u>TWO</u> of the following:** **8**

i) State the methods of locating contours with merits and demerits of each.

ii) Explain with sketch measurement of deflection angle using Theodolite.

iii) Give classification of EDM instruments.

2. Attempt any <u>FOUR</u> of the following: **16**

a) Points P and Q are two ground points at a distance of 20 m with their reduced levels are 75.380 and 78.260 m respectively interpolate the contours of 76, 77 and 78.

b) An irregular area was measured with planimeter keeping anchor point inside the figure. The IR was 8.495 and FR was 4.325. The zero crosses fixed index mark twice in clockwise direction find area of figure using m = 100 and c = 22.

c) Define transiting, swinging, face left and telescope inverted in case of Theodolite.

d) State any four uses of contour maps.

e) State any four uses of total station.

f) State with sketch principle of remote sensing.

Marks

3. Attempt any <u>FOUR</u> of the following: **16**

a) State with sketch procedure for computing constants of planimeter.

b) Which errors are eliminated by method of repetition?

c) The interior angles of closed traverse ABCDE are as follows:

$\angle$ A = 78° 40′ 15″

$\angle$ B = 104° 45′ 20″

$\angle$ C = 85° 35′ 40″

$\angle$ D = 150° 40′ 30″

$\angle$ E = 120° 18′ 15″

The bearing of line AB is 220° 25′ 30″ calculate bearings of remaining sides.

d) State any four features of digital level.

e) State any four uses of digital level.

f) Two straights meet at chainage 1800 m with deflection angle 60°. The radius of curve is 100 m find,

i) Tangent length

ii) Long chord

iii) Length of curve

iv) Chainage of T.

Marks

4. Attempt any <u>FOUR</u> of the following: **16**

a) Explain with example, establishing grade contours.

b) Write any four desirable characteristics of good theodolite.

c) State principle of Tacheometer with sketch.

d) State how data is retrieved through total station.

e) Calculate the ordinates at 8 m interval for a circular curve with length of long chord 96 m and radius 150 m.

f) Following are the length and bearing of traverse.

Line	Length 'm'	Bearing
AB	260 m	30°
BC	325 m	140°
CD	185 m	210°

Find length and bearing of line DA.

5. Attempt any <u>FOUR</u> of the following: **16**

a) Explain with sketch characteristics of contour line.

b) State the procedure of measuring bearing with a theodolite.

c) Following are the co-ordinates of point A and B.

Station	Northing	Easting
A	780	650
B	600	450

Find length and bearing of line AB.

Marks

d) A tacheometer fitted with anallatic lens was set up at station A and the following readings were obtained on vertically held staff.

Inst. Station	Staff Station	Vertical angle	Stadia	Readings
A	BM	+8°	0.800, 1.120	1.480
A	B	–4°	1.140, 1.235	1.330

The constants (f/i) is 100, find distance AB and RL of Station B as RL of BM is 100.000 m.

e) State any four features of total station.

f) Give classification of curves.

6. Attempt any <u>FOUR</u> of the following: **16**

a) State any four situations where tacheometry is essential.

b) A tacheometer was set on station A and following observations are taken on vertical staff.

Inst. Station	Observed	Distance Station	Stadia m	Readings
0	A	150	1.255	1.750
	B	200	1.0	1.900
	C	250	0.75	1.200

Find constants of this tacheometer.

Marks

c) Explain construction of one second micro optic theodolite.

d) Two straight lines AB and BC intersect at chainage 2415 m, deflection angle being 10°. Calculate all data necessary for setting out a 4° simple curve by deflection angle. The peg interval 30 m. Give table of deflection angles.

e) State any four applications of remote sensing.

f) Determine area of figure with planimeter having IR = 9.0, FR = 4.50, C = 21.50 and M = 100 cm^2, zero mark of the disc passes once in clockwise direction with anchor point inside the figure.

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