Please check that this question paper contains 9 questions and 2 printed pages within first ten minutes.

MORNING
02 JAN 2023

[Total No. of Questions: 09] [Total No. of Pages: 02]

Uni. Roll No. .....

Program: B.Tech. (Batch 2018 onward)
Semester: 3rd
Name of Subject: Surveying & Geomatics
Subject Code: PCCE-101
Paper ID: 16020
Scientific calculator is Allowed

Detail of allowed codes/charts/tables etc. : Not Applicable

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

Part – A **[Marks: 02 each]**

Q1.

a) Explain the errors of Crab & Drift with sketch.

b) Why ranging is important before chaining?

c) What is the basic principle of Electromagnetic Distance Measurement (E.D.M.)?

d) Classify the different types of curves along with their sketches.

e) What is 'correction for sag' and when to apply?

f) What are the temporary adjustments of an auto-level?

Part – B **[Marks: 04 each]**

Q2. The bearings of sides of triangle ABC are given below. Determine the included angles:

Line	Fore Bearing	Back Bearing
AB	48°	228°
BC	136°	316°
CA	290°	110°

Q3. Discuss the major components of GPS system.

Q4. Write in brief about remote sensing observation platforms.

Q5. The following readings were taken at 5m levelling staff on continuously sloping ground at a common interval of 15m. The first point having RL of 185.275m. Calculate RI of points & gradient of line joining first and last points: 0.415, 1.025, 2.085, 2.925, 3.620, 4.595, 0.715, 2.115, 3.090, 4.405.

Q6. An embankment for railway is 12m wide with side slope of 2 horizontal to 1 vertical. Assuming the ground to be level in a direction transverse to the centre line, find the volume of earthwork for a length of 150m. The centre heights at 25m intervals are, 3.25m, 3.50m, 3.95m, 4.20m 4.05m, 3.28m & 3.0m.

P.T.O.

Q7. State three-point problem. Explain how it is solved by the graphical method.

Part – C **[Marks: 12 each]**

Q8. The data given in table were obtained for an anti-clockwise closed traverse. The independent coordinates of the station A are (E= 1500m & N= 1500m). Determine the corrected coordinates of all the stations after adjusting the traverse by Bowditch rule.

Internal angles	Length (m)	Bearing
∠A = 130°18'45"	AB = 17.098	AF = 136°25'12"
∠B = 110°18'23"	BC = 102.925	
∠C = 99°32'35"	CD = 92.782	
∠D = 116°18'02"	DE = 33.866	
∠E = 119°46'07"	EF = 63.719	
∠F = 143°46'20"	FA = 79.097	

OR

A line was levelled tacheometrically, the value of multiplying & additive constant being 100 & 0 respectively. The following observations were made, with staff held vertically: R.L. of B.M. = 583.66m. Compute the R.L.'s of P,Q and R.

Inst. Stn.	H.I. (m)	Staff held at	Vertical angle	Staff reading (m)		
				Bottom	Center	Top
P	1.40	B.M.	-1°35'	1.120	2.330	3.540
P	1.40	Q	+2°54'	1.210	2.380	3.550
Q	1.38	R	+3°12'	0.865	2.425	3.985

Q9. Write note on: (a) Photomaps and mosaics, (b) Across track & along track scanners, (c) Differential-GPS, (d) LADAR surveying.

OR

a) To determine the avg. scale of an aerial photograph, three points A,B & C were selected. Their elevations were determined from a contour map as 1400m, 900m & 1100m respectively. If the flying height of aircraft above m.s.l. is 3500m and focal length of camera lens is 160mm, calculate the avg. scale of aerial photograph.

b) A tower was photographed from an elevation of 800m above the datum. The radial distances of top and bottom of the tower from the principal point are 112.2mm & 81.6mm respectively. If the bottom of the tower has elevation of 250m. Determine the height of the tower above its bottom.

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