BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: B.Tech. **SEMESTER : IV**
BRANCH: CIVIL **SESSION : SP/2023**

SUBJECT: CE208R SURVEYING

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	The following bearings are taken on a closed compass traverse.	[5]	CO1	3

Line	F.B.	B.B.
AB	80º10’	259º0’
BC	120º20’	301º50’
CD	170º50’	350º50’
DE	230º10’	49º30’
EA	310º20’	130º15’

Compute the interior angles and correct them for observational errors.

Q.1(b)	What is resection? Explain the solution of three-point problem using tracing paper method.	[5]	CO1	2

Q.2(a)	The following staff readings were taken.	[5]	CO2	3

Station	BS	IS	FS	HI	RL	Remarks
A	0.865				560.500	BM
B	1.025		2.105			
C		1.580				Platform
D	2.230		1.865			
E	2.355		2.835			
F			1.760			

Find the RL of the stations using height of instrument method. Also apply the check.

Q.2(b)	Explain the reiteration method of measurement of horizontal angles using a theodolite.	[5]	CO2	2

Q.3(a)	Two tangents intersect at chainage 59 + 60, the deflection angle being 50º30‘, calculate the necessary data for setting out a curve of 15 chains radius to connect the two tangents by using offsets from chord produced. Assume peg interval as 100 links. The length of chain is 20 m (100 links).	[5]	CO3	3
Q.3(b)	A road bend which deflects 80º is to be designed for a maximum speed of 100 km/hr, a maximum centrifugal ratio of ¼ and a maximum rate of change of acceleration of 30 cm/s^3. The curve consists of a circular arc combined with two cubic spirals. Calculate (a) radius of circular arc, (b) length of transition curve, (c) total length of combined curve, and (d) chainages of beginning and end of transition curves and junctions. Chainage of PI is 42862 m.	[5]	CO3	3
Q.4(a)	The altitude of two proposed stations A and B, 130 km apart are 220 m and 1160 m respectively. The altitude of two points C and D on the profile between them are 308 m and 632 m. The distances AC = 50 km and AD = 90 km. Determine if A and B are intervisible. Find the minimum height of signal at B assuming A at ground level. Maintain minimum ground clearance of 3 m.	[5]	CO4	3

PTO

Q.4(b)	Find the RL of Q from the following observations. Horizontal distance between P and Q = 9290 m Angle of elevation from P to Q = $2^0 6'' 18''$ Height of signal at Q = 3.96 m Height of instrument at P = 1.25 m Coefficient of refraction = 0.07 R Sin 1" = 30.88 m RL of P = 396.58 m	[5]	CO4	3
Q.5(a)	Briefly discuss the electronic distance measurement. What is the difference between an electronic theodolite and a total station?	[5]	CO5	2
Q.5(b)	What is the use of astronomical surveying? What is spherical excess?	[5]	CO5	1

::::::25/04/2023::::::M