ACE
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Question Paper Code: | CE301PC | | ACE-R20

Semester Supplementary Examination
II B. Tech- I Semester- SEPTEMBER-2022
SURVEYING AND GEOMATICS
(Civil Engineering)

Time: 3 Hours   Max. Marks: 70

H. T. No

Answer any 5 Questions out of 8 Questions from the following
M=Marks

Q.No	Question	M
1. a)	Classify different types of surveying based on accuracy and based on purpose of surveying.	7
b)	A steel tape 20m long standardized at 27°C with a pull of 10kg was used for measuring a base line. Find the corrections for tape length if the temperature at the time of measurement was 40°C and the pull exerted was 16kg. Weight of 1 cubic cm of steel is 7.86gm, Weight of tape is 0.8kg and E=2.109x106 kg/cm². Coefficient of expansion of tape per 10C= 6.2x10⁻⁶.	7
2. a)	The following consecutive readings were taken with a level and 5m levelling staff on continuously sloping ground at a common interval of 20m: 0.385, 1.030, 1.925, 2.825, 3.730, 4.685, 0.625, 2.005, 3.110 and 4.485. The reduced level of the first point was 208.125m. Calculate the reduced levels of the points using rise and fall method. Also find the gradient.	10
b)	If the magnetic bearing of line AB was N59°30' in the year 2000, when the declination was 4°10'E. If the present declination is 3°W, what is the whole circle bearing of the line AB?	4
3. a)	In levelling between two points A and B on opposite banks of river, the level was setup near A, and the staff readings on A and B were 1.285 and 2.860m respectively. The level was then moved and set up at near B and the respective readings on A and B were 0.860 and 2.220. Find the true difference of level between A and B.	4
b)	A railway embankment 500m long is 10m wide at the formation level and has the side slope 1.5 to 1. The ground levels at every 100m along the center line are as under:	10

Distance, m	0	100	200	300	400	500
R.L.	108.6	110.4	111.5	111	112.5	110.5

The formation level at the initial point is 112.00m and the embankment has a rising gradient of 1 in 150. The ground is level across the center line. Calculate the total volume of earthwork.

| 4. a) | Explain the method of repetition for obtaining horizontal angles for a theodolite | 7 |

		with a neat sketch	
	b)	A road embankment 14m wide at the formation level, with side sloped of 2.5 to 1 and with an average height of 4m is constructed with an average gradient 1 in 50 from contour 130m to 170m. Find the volume of earthwork.	7
5. a)		Coordinates of two points A and B are given below. A third point C has been chosen in such a way that bearings of AC and CB are $29^0 30'$ and $45^0 45'$ respectively. Calculate the lengths of the lines AC and BC. POINT / NORTHING (m) / EASTING (m) table below	7
	b)	Derive an expression for finding the RL of and inaccessible point using trigonometric levelling by drawing a neat sketch.	7
6. a)		A levelling staff is held vertical at distances of 150m and 250m from the axis of tacheometer and the staff intercept for horizontal sights are 1.5m and 2.4m respectively. Find the constants of the instrument. This instrument is setup at station A and the staff is held vertical at point B. With the telescope inclined at an angle of depression 200 to the horizontal, the readings on the staff are 1.5m, 1m and 0.5m. Calculate the R.L. of B and its horizontal distance from A if the height of instrument is 2m and R.L. of BM is 100m.	10
	b)	Elaborate the applications of GPS related to Civil Engineering.	4
7. a)		Two straight lines meet at a chainage of 2545m. A right-handed circular curve of radius 400m joins them. The deflection angle between the straights is 80^0. Considering chord interval as 25m, tabulate the deflection angles by Rankine's method.	8
	b)	Explain component parts of total station with a sketch along with its advantages and disadvantages.	6
8. a)		A vertical photograph of size 25cmX20cm were taken to cover total area on ground of 400km². If the scale of the photograph is 1cm= 300m. Calculate the number of photographs required if longitudinal overlap is 30% and side overlap is 25%.	7
	b)	Explain different types of photographs.	7

Table for Question 5. a):

POINT	NORTHING (m)	EASTING (m)
A	150	200
B	1500	1300