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UG/3rd/UCE301

2021

SURVEYING-I

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	Explain the following methods of plane table surveying: (i) Radiation (ii) Intersection	**[2x3=6]**
	b)	What is contour? What are the characteristics of contours?	**[1+5=6]**
	c)	The following bearings were observed with a compass: AB 74°0' BA 255°0' BC 91°0' CB 270°0' CD 164°0' DC 342°0' DE 177°0' ED 0°0' EA 189°0' AE 9°0' Where do you suspect the local attraction? Find the correct bearings.	**[8]**
2.	a)	Write down the procedure for reiteration method to determine a group of horizontal angles having a common vertex point.	**[6]**
	b)	Explain any four uses of contour map.	**[6]**
	c)	Differentiate between contour interval and horizontal equivalent. What are the factors on which the choice of proper contour interval depends?	**[4+4=8]**
3.	a)	What is orientation in plane table surveying? Explain the different methods of orientation.	**[2+4=6]**
	b)	What is reciprocal levelling? Explain the difference between "Height of Instrument" and "Rise and Fall" method of reducing levels.	**[2+4=6]**
	c)	Derive the formulae for height and distance of an object, when object and instrument stations are in the same vertical plane and base of the object is inaccessible.	**[8]**
4.	a)	The following readings were obtained in running fly-levels from a bench	**[8]**

mark of R.L. 384.705m.

3.215, 1.045, 1.095, 1.844, 2.224, 3.215, 2.058, 2.042, 2.060, 1.850

The instrument was shifted after 4th, 6th and 8th readings. Enter the readings in a level field book form and reduce the readings by height of instrument method.

b) What is geodetic survey? Derive the expressions for correction of curvature and refraction. **[2+6=8]**

c) Write down few advantages and disadvantages of plane table surveying. **[4]**

5. a) What is backsight and foresight in levelling? What do we mean by balancing backsight and foresight? **[2+4=6]**

b) Explain the fundamental lines and their desired relations of a theodolite. **[6]**

c) To determine the elevation of the top of a building, the following observations were made: **[8]**

Instrument Station	*Reading on B.M. (m)*	*Angle of elevation*	*Remarks*
A	1.456	12°42'	RL of BM=250.480m
B	1.052	8°12'	

stations A and B and the top of the building are in the same vertical plane. Find the elevation of the top of the building, if the distance between A and B is 100m.

6. a) Define the following: **[5x2=10]**

i) Contour gradient

ii) Parallax

iii) Benchmark

iv) Magnetic bearing

v) Local attraction

b) What is indirect ranging? Explain **[5]**

c) Explain the steps followed in temporary adjustments of a vernier theodolite. **[5]**

7. a) Differentiate between: **[5x2=10]**

i) WCB and QB systems in compass surveying

ii) Traverse type and Johnson type plane table

iii) Open traverse and closed traverse

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iv) Metric chain and surveyor's chain

v) Back bearing and fore bearing.

b) Derive the formulae for height and distance of an object, when object and instrument stations are **not** in the same vertical plane. **[10]**

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