

Printed Pages – 5

Roll No. : .....

**320453(20)**

**B. E. (Fourth Semester) Examination 2020-**

**APR-MAY 2022**

**(New Scheme)**

**(Civil Branch)**

**SURVEYING-II**

**Time Allowed : Three hours**

**Maximum Marks : 80**

**Minimum Pass Marks : 28**

**Note :** Attempt all questions. Part (a) of each question is compulsory. Answer any two parts out of three from (b), (c) and (d).

**Unit-I**

1. (a) Define principle and classification of triangulation system.

2

- (b) The angles  $A$ ,  $B$  and  $C$  of a triangle  $ABC$  have been observed several times with the following result :

$\angle A$	$\angle B$	$\angle C$
$58^{\circ}51'30''$	$70^{\circ}47'24''$	$50^{\circ}21'12''$
$58^{\circ}51'28''$	$70^{\circ}47'22''$	$50^{\circ}21'13''$

$BM$  and station  $B$ . 7

- (c) Explain the reduction of phase error when the signal is partly illuminated. 7
- (d) What is meant by a satellite station and reduction to center? Derive expression for reducing the angles measured at satellite stations to centre. 7

**Unit-II**

2. (a) Explain principle of least square. 2
- (b) How will you determine the most probable values? 7
- (c) The following angles were measure at a station :

Angle	Weight
$A = 40^{\circ}36'25''$	2
$B = 30^{\circ}12'40''$	2
$C = 65^{\circ}30'15''$	1

$A+B = 70^{\circ}49'10''$  2

$B+C = 95^{\circ}42'52''$  1

Find the most probable values of  $A$ ,  $B$  and  $C$ . 7

- (d) The following are the three angles  $x$ ,  $y$  and  $z$  observed at a station  $S$  closing the horizon :

$x = 78^{\circ} 12' 12'' \pm 2''$

$y = 136^{\circ} 48' 30'' \pm 4''$

$z = 144^{\circ} 59' 08'' \pm 5''$

Determine them corrected values. 7

**Unit-III**

3. (a) Name the different methods of tacheometry. 2
- (b) Derive distance and elevation formulae for inclined signals with staff vertically by fixed hair method. 7
- (c) Write short notes on any two of the following : 7
- (i) Geodimeter and Tellurometer
  - (ii) Range finders
  - (iii) Total station
- (iv) (d) Subtense theodolite

- (d) In the tangential method of tacheometry, two vanes were fixed at an interval of 1 m on a 3 m staff with bottom vane at 1.0 m. The staff was held vertical at station *A* and the vertical angles measured for the two vanes were  $5^{\circ}30'$  and  $3^{\circ}15'$  respectively. Find the reduced level and horizontal distance of *A* if RL of bench mark was 400 m and height of instrument is 1.25 m.

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**Unit-IV**

4. (a) What is meant by stereo-photogrammetry?
- (b) Derive expression for various scales in a vertical photograph.
- (c) What are the major application area of GIS?
- (d) Write the expression for length of line between two stations of different elevations as from an aerial photograph? Two points *A* and *B* having elevation of 500 m and 300 m respectively above datum appear on the vertical photograph having focal length of 20 cm and flying attitude of 2500 m above datum.

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Corrected co-ordinates are :

Point	Photo	Co-ordinates
	$x$ (cm)	$x$ (cm)
<i>a</i>	+ 2.68	+ 1.36
<i>b</i>	- 1.94	+ 3.65

Determine the ground line length *AB*.

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**Unit-V**

5. (a) Define hydrographic survey.
- (b) What is fathometer? Explain the method of locating sounding by two angles from shore.
- (c) Write short note on three-point problem in hydrographic survey.
- (d) *A*, *B* and *C* are three triangulation stations on a coast line and *P* is a sounding point in sea. Distance  $AB = 1250$  m,  $BC = 1310$  m, angle  $ABC = 122^{\circ}30'$ , angle  $ABP = 45^{\circ}24'$  and angle  $BPC = 48^{\circ}36'$ . *A* and *C* are respectively west and east of *BP* whereas *P* is south of *B*. Calculate the distances *AP*, *BP* and *CP*.

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