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18CV35

Third Semester B.E. Degree Examination, July/August 2022 Basic Surveying

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Enumerate the applications of surveying in civil engineering. (06 Marks)
- b. Discuss the classification of surveying. (08 Marks)
- c. The distance between two points A and B measured along slope is 504 m. Find the horizontal distance between A and B when,
 - (i) The angle of slope is 12°
 - (ii) The slope is 1 in 4.5
 - (iii) The difference in Elevation of A and B is 65 m (06 Marks)

OR

- 2 a. What is field book? List the points to be kept in mind while entering in field book. (08 Marks)
- b. A rectangular plot measures $20\text{cm} \times 30\text{cm}$ on a village map drawn to a scale of $1\text{ cm} = 100\text{ m}$. Calculate area in hectares. If it is redrawn on topo sheet to scale of $1\text{ km} = 1\text{ cm}$. What will be its area? Determine representative fraction in both the cases. (06 Marks)
- c. A survey line BAC crosses a river, A and C being on the near and distant banks respectively. A 50 m perpendicular line to AB is measured from "A". Bearing of "C" and "B" are 320° and 230° respectively. AB being 25 m. Find the width of the river. (06 Marks)

Module-2

- 3 a. Differentiate between :
 - (i) True meridian and magnetic meridian. (ii) WCB and QB
 - (iii) Fore bearing and back bearing. (06 Marks)
- b. Compute the bearings for setting out regular pentagon, if the bearing of line AB is $30^\circ 0'$. (06 Marks)
- c. The following bearing were observed in running a closed traverse. Determine the correct magnetic bearings of the lines. (08 Marks)

Line	FB	BB
AB	$38^\circ 30'$	$219^\circ 15'$
BC	$100^\circ 45'$	$278^\circ 30'$
CD	$25^\circ 45'$	$207^\circ 30'$
DE	$325^\circ 15'$	$145^\circ 15'$
EA	$190^\circ 30'$	$10^\circ 15'$

OR

- 4 a. Explain the following :
 - (i) Latitude and Departure (ii) Dependent and Independent co-ordinates (06 Marks)
- b. What is closing error? Explain Bowditch's method of adjusting the traverse. (06 Marks)
- c. Adjust the following traverse using transit rule: (08 Marks)

Line	AB	BC	CD	DE	EA
Latitude	62.96	67.60	-143.67	-104.97	118.57
Departure	63.33	209.10	47.05	-119.55	-199.70

Module-3

- 5 a. Write a short note on Auto level. (05 Marks)
- b. Define the following terms: (05 Marks)
- (i) Reduced level. (ii) Turning point (iii) MSL
- (iv) Back sight (v) H.I.
- c. The following staff readings were observed successively with a level, the instrument having been moved after third, sixth and eighth readings. Enter readings and calculate RL of points by H.I method, if first reading was taken with a staff held on BM = 432.384 m.
2.228 m, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044, 2.684 m (10 Marks)

OR

- 6 a. Explain differential leveling with a neat sketch. (06 Marks)
- b. Write a note on curvature and refraction correction. (06 Marks)
- c. Following details were recorded in level work. Calculate (i) True R.L of point "B"
(ii) Angular error in collimation (iii) Combined correction for curvature and refraction.
If distance between A and B is 1000 m. (08 Marks)

Instrument at	Staff reading on		Remarks
	A	B	
A	1.625	2.545	R.L.A = 100.80 m
B	0.725	1.405	

Module-4

- 7 a. What are the advantages and disadvantages of plane table surveying? (06 Marks)
- b. Describe briefly radiation method and intersection method of plane tabling. (10 Marks)
- c. Write short notes on orientation of plane table. (04 Marks)

OR

- 8 a. Explain the graphical method of solution of two point problem with sketches. (08 Marks)
- b. Describe the different forms of errors in plane table. (06 Marks)
- c. Briefly explain the working operation of plane table surveying. (06 Marks)

Module-5

- 9 a. Define contour. List any six characteristics of a contour with sketches. (08 Marks)
- b. Discuss the different methods of determining area. (04 Marks)
- c. A series of offsets were taken from a chain line to a curved boundary line at 10 m intervals in the following order: 3.25, 5.60, 4.20, 6.65, 8.75, 6.20, 3.25, 4.20, 5.65
Calculate the area by,
(i) Average ordinate rule. (ii) Trapezoidal rule
(iii) Simpson's rule (08 Marks)

OR

- 10 a. A road embankment is 30 m wide at the top with side slopes of 2 : 1. The ground levels at 100 m intervals along a line AB are as under:
A170.30, 169.10, 168.50, 168.10, 166.50B.
The formation level at "A" is 178.70 m, with uniform falling gradient of 1 in 50 from A to B. Determine the volume of earth work by prismoidal rule. Assume the ground to be in cross section. (08 Marks)
- b. Explain Interpolation of contours. List the methods of contouring. (06 Marks)
- c. Write short notes on Digital planimeter. (06 Marks)
