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## Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 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. Define surveying. Enumerate the applications of surveying. (10 Marks)  
 b. Discuss the classification of surveying. (10 Marks)

OR

- 2 a. Explain Indirect method of ranging with a sketch. (10 Marks)  
 b. A big pond obstructs the chain line AB. A line AL was measured on the left of the line AB for circumventing the obstacle. The length of AL was 901 m. Similarly the line AM was measured on the right of the line AB whose length was 1100 m. Points M, B, L are in straight line. Length's of the links BL and BM are 502 m and 548 m respectively. Find the distance AB. (10 Marks)

### Module-2

- 3 a. Distinguish between:  
 i) True meridian and magnetic meridian  
 ii) Whole Circle bearing and Quadrantal bearing. (05 Marks)  
 b. A closed compass traverse ABCDEA was conducted round a forest and the following bearings were observed with a compass. Calculate the interior angles. Apply check and plot the traverse (not to scale).

Line	AB	BC	CD	DE	EA
Fore bearing	60°30'	122°00'	46°00'	205°30'	300°00'

- (10 Marks)
- c. The magnetic bearing of a line was found to be N 60°30' W in 2002, when the declination was 5°10'E. Find its present magnetic bearing, if declination is 3° W. (05 Marks)

OR

- 4 a. Explain briefly the applications of theodolite. (08 Marks)  
 b. Explain the repetition method of measuring the horizontal angle using transit theodolite and errors eliminated by that method. (12 Marks)

### Module-3

- 5 a. What is meant by balancing of traverse? Explain the Bowditch method of adjusting the traverse. (10 Marks)  
 b. A tacheometer, fitted with an anallactic lens and having the multiplying constant 100, was set up at station C to determine the gradient between two points A and B and the following observations were taken keeping the staff vertical.

Staff @	Vertical angle	Stadia readings
A	+4°20'0"	1.300, 1.610, 1.920
B	0°10'40"	1.100, 1.410, 1.720

If the horizontal angle ACB is 35°20' determine the gradient between A and B. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8=50, will be treated as malpractice.





OR

- 6 a. Derive the distance and elevation formulae for stadia techeometry, when the staff is held vertical and the line of sight being inclined upwards and downwards. (08 Marks)
- b. Describe the closing error in a compass traverse. Explain how the closing error is adjusted by transit rule. (06 Marks)
- c. The bearings of PQ and QR are  $18^{\circ}36'$  and  $60^{\circ}24'$  respectively. The coordinated of the ends P and R are:

Point	North coordinate	East Coordinate
P	300.0	400.0
R	1432.8	1257.2

Find the length of PQ and QR.

(06 Marks)

**Module-4**

- 7 a. Explain the effects of curvature and refraction in leveling. (08 Marks)
- b. The following observations were made on a hill top to ascertain its elevation. The height of the target F was 5m.

Instrument Station	Staff reading on BM	Vertical Angle	Remarks
O <sub>1</sub>	2.550	$18^{\circ}6'$	RL of
O <sub>2</sub>	1.670	$28^{\circ}42'$	BM = 345.58

The instrument station were 100 M apart and wave in line with 'F'.

(12 Marks)

OR

- 8 a. The following consecutive readings were taken with a dumpy level and 4m leveling staff on a continuously sloping ground at a common interval of 30m: 0.415, 1.025, 2.085, 2.925, 3.620, 0.715, 2.115, 3.090, 0.405, 1.525, 2.005, 3.650. The first point was 185.575 M above MSL. Rule out a page of level book and enter the readings. Calculate the reduced levels of all the points by "Height of instrument method". Also calculate the gradient of line joining first and last points. (10 Marks)
- b. Derive the expressions for the horizontal distance, vertical distance and the elevation of an elevated object, when the base is inaccessible and instrument stations are not in the same vertical plane with the object. (10 Marks)

**Module-5**

- 9 a. The following perpendicular offsets were taken from a chain line to an irregular boundary

Chainage	0	10	20	30	40	50	60	70
Off set	14.2	28.5	35.8	30.6	29.0	27.6	33.5	26.0

Compute the area of by: i) Mid ordinate rule (ii) Trapezoidal rule (iii) Simpson's rule

(12 Marks)

- b. Write short notes on digital planimeter. (08 Marks)

OR

- 10 a. Describe the different characteristics of contours. (08 Marks)
- b. Explain the interpolation of contours. List the methods of contouring. (04 Marks)
- c. 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: A 170.30, 169.10, 168.50, 168.10, 166.50 B. The formation level at 'A' is 178.70M with uniform falling ground of 1 in 50 from 'A' to 'B'. Determine the volume of earthwork by prismatic formula. Assume the ground to be in cross-section. (08 Marks)

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