

Third Semester B.E. Degree Examination, Feb./Mar.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. Explain the classification of survey. (04 Marks)
 b. Explain the basic principles of surveying with sketches. (06 Marks)
 c. What is conventional symbols? With neat sketches show any six conventional symbols used in surveying. (10 Marks)

OR

- 2 a. What is ranging? Explain indirect ranging with neat sketch. (06 Marks)
 b. With neat sketches, explain obstacles in chaining. (08 Marks)
 c. A steel tape 20 m long standardized at 55°F with a pull of 100 N was used for measuring base line. Find the correction per tape length, if the temperature at the time of measurement was 80°F and pull exerted was 160 N. Weight of 1 cubic cm of steel is 0.0786 N. Weight of tape is 8 N and $E = 2.1 \times 10^5 \text{ N/mm}^2$. Co-efficient of expansion of tape per $1^\circ \text{F} = 6.2 \times 10^{-6}$. (06 Marks)

Module-2

- 3 a. Define the terms : (i) True bearing (ii) Magnetic bearing (iii) Magnetic declination and (iv) Angle of dip. (06 Marks)
 b. Differentiate between prismatic and surveyor compass (any 4). (06 Marks)
 c. The following bearings were observed in running a closed traverse:

Line	F.B.	B.B.
AB	75°5'	254°20'
BC	115°20'	296°35'
CD	165°35'	345°35'
DE	224°50'	44°5'
EA	304°50'	125°5'

At what station do you suspect the local attraction? Determine the correct magnetic bearings. If declination was 5°10' E. What are the true bearings? (08 Marks)

OR

- 4 a. Explain the Bowditch's and Transit method of adjusting closed traverse. (06 Marks)
 b. Explain closed and open traverse with neat sketch. (06 Marks)
 c. The following records were obtained in a compose traverse. Compute the length and bearing of DA:

Line	Length (m)	Bearing
AB	75.5	30°24'
BC	180.5	110°36'
CD	60.25	210°30'
DA	?	?

(08 Marks)

Module-3

- 5 a. Define the following terms:
 (i) Back sight (ii) Fore sight (iii) Benchmark (iv) Reduced level. (06 Marks)
 b. What are the methods of leveling? Explain briefly. (06 Marks)

- c. The following consecutive readings were taken with a level and 5 m leveling staff on continuously sloping ground at a common interval of 20 m. 0.385, 1.030, 1.925, 2.825, 3.730, 4.685, 0.625, 2.005, 3.110 and 4.485 m. The reduced level of first point was 208.125 m. Rule out a page of level field book and enter the above readings. Calculate the reduced levels of points by rise and fall method and apply check. Calculate also the gradient of line joining the first and last point. (08 Marks)

OR

- 6 a. Illustrate with neat sketches:
 (i) Profile leveling (ii) Differential leveling
 (iii) Fly leveling and (iv) Reciprocal leveling (08 Marks)
- b. Enumerate the errors in leveling. (04 Marks)
- c. The following notes refer to reciprocal levels taken with one level:

Inst. at	P	Q	Remarks
P	1.824	2.748	Distance between P and Q = 1010 m
Q	0.928	1.606	RL of P = 126.386

Find :

- (i) True RL of Q (ii) The combined correction for curvature and refraction and
 (iii) The angular error in the collimation adjustment of the instrument. (08 Marks)

Module-4

- 7 a. Explain with neat sketch, the procedure for,
 (i) Radiation method
 (ii) Intersection method and
 (iii) Traversing method in plane table surveying (09 Marks)
- b. State and explain solution to two-point problem. (08 Marks)
- c. Define Re-section. (03 Marks)

OR

- 8 a. State and explain solution to three point problem. (10 Marks)
- b. List the advantages, disadvantages and errors in plane table surveying. (10 Marks)

Module-5

- 9 a. Discuss the methods for determining areas and volume. (08 Marks)
- b. Define a contour. List the uses of contour maps. (04 Marks)
- c. The following perpendicular offsets were taken from a chain line to a hedge:

Chainage (m)	0	15	30	45	60	70	80	100	120	140
Offsets (m)	7.6	8.5	10.7	12.8	10.6	9.5	8.3	7.9	6.4	4.4

Calculate the area between survey line, the hedge and end offsets by,

- (i) Trapezoidal rule. (ii) Simpson's rule. (08 Marks)

OR

- 10 a. What are the characteristics of contour? Explain with sketches. (07 Marks)
- b. List the methods of contouring. Explain briefly. (05 Marks)
- c. A railway embankment 400 m long is 12 m wide at the formation level and has side slope of 2 to 1. The ground levels at every 100 m along the centre line are as under.

Distance (m)	0	100	200	300	400
R.L (m)	204.8	206.2	207.5	207.2	208.3

The formation level at zero chainage is 207.00 and the embankment has a rising gradient of 1 in 100. The ground is level across the centre line. Calculate the volume of earth work by,

- (i) Trapezoidal formula. (ii) Prismoidal formula. (08 Marks)
