

B.E DEGREE EXAMINATIONS: NOV/DEC 2010

Third Semester

CIVIL ENGINEERING

U07CE306: Surveying I

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. A 20m chain is divided into
(a) 150 links (b) 100 links (c) 200 links (d) 50 links
2. If a 20 m chain gets displaced from correct alignment by a perpendicular distance D m, then the error is given by
(a) $D^2 / 40$ (b) $D^2 / 60$ (c) $D^2 / 80$ (d) $D^2 / 30$
3. Open traverse is suitable in the survey of
(a) Ponds (b) Rivers (c) Estates (d) Valley
4. The principle of plane table is
(a) Parallelism (b) Triangulation (c) Traversing (d) Ranging
5. The operation of levelling across any river is termed
(a) Profile levelling (b) Reciprocal levelling
(c) Compound levelling (d) Simple levelling
6. The line joining points of equal elevation is known as a
(a) Horizontal line (b) Contour line (c) Level line (d) Ridge line
7. The characteristic of Gale's table is that the independent coordinates of all points are brought to the
(a) Fourth quadrant (b) First quadrant (c) Third quadrant (d) second quadrant
8. The face left position is also called
(a) Telescope inverted (b) Telescope normal
(c) Telescope reversed (d) Telescope parallel to foot screw
9. The allowable centrifugal ratio (CR) for railways is
(a) 1/4 (b) 1/8 (c) 1/6 (d) 1/3
10. An ideal transition curve is also known as a
(a) Clothoidal curve (b) Cubical curve (c) Parabolic curve (d) Semi parabolic curve

PART B (10 x 2 = 20 Marks)

11. Distinguish between plane surveying and geodetic surveying
12. Define Well conditioned triangle
13. Define magnetic declination
14. What is orientation?
15. List the types of Bench marks
16. Define contour gradient
17. Write the functions of theodolite?
18. Mention the characteristic of gale's table
19. Define super elevation
20. What are the different shapes of transition curves?

PART C (5x14 = 70 Marks)

21. a) (i) Explain how you would range a chain line between two points which are not intervisible (8)

- (ii) A Chain was tested before starting a survey of field and was found to be exactly 30m. At the end of the survey, it was tested again and found to be measures 30.16 m. The area of the plan drawn to a scale of 1cm = 60m was 92.50 cm². Find the true area of the field. (6)

(OR)

- b) (i) Briefly explain the obstacles in chaining. (6)

- (ii) A 20m steel tape was standardized on flat ground at a temperature of 20°C and under the pull of 15 kg. The tape was used in catenary at a temperature of 30°C and under a pull of P kg. The cross sectional area of the tape is 0.22 cm² and its total weight is 400g. The young's modulus and coefficient of linear expansion of steel are 2.1×10^6 kg/cm² and 11×10^{-6} per °C respectively. Find the correct horizontal distance if P is equal to 10kg. (8)

22. a) (i) List the difference between surveyor's and prismatic compass. (6)

- (ii) The following bearings are observed while traversing with a compass and tape. Check the bearings for local attraction. Correct the bearings by the method of included angles. (8)

AB	188°45'	BA	7°45'
BC	118°15'	CB	298°15'
CD	346°35'	DC	166°30'
DE	337°05'	ED	158°10'
EA	293°30'	AE	113°00'

(OR)

- b) What is three point problem? Explain it using Bessel's method.

23. a) (i) The following staff readings were recorded in a levelling operation 1.185, 2.604, 1.925, 2.305, 1.155, 0.864, 1.105, 1.685, 1.215, 1.545 and 0.605. A is a bench mark of reduced level 185.685 m. Find the RLs of all the other points by the height of collimation method. The first reading was to point A and the instrument was shifted after the readings 2.604, 0.864 and 1.215. (9)
- (ii) How the temporary adjustment is done in leveling? (5)

(OR)

- b) (i) Explain briefly about the characteristics of contours. (5)
- (ii) The formation width of a certain cutting is 8 m and the side slope is 1:1. The surface of the ground has a uniform slope of 1 in 10. If the depths of cutting at the centers of three sections 40 m apart are 2, 3 and 4 m respectively. Find the volume of earth work. (9)
- 24) a) Explain in detail, how the horizontal angles are measured by repetition and reiteration methods.

(OR)

- b) The following data refer to a closed traverse. Compute the missing quantities.

LINE	LENGTH (m)	BEARING
AB	725	S 60°00'E
BC	1050	?
CD	1250	?
DE	950	S 55°30'W
EA	575	S 02°45'W

25. a) (i) Two straight lines AB and BC intersect at a chainage of 510.23 m. The angle of intersection being 126°48'. The radius of the curve is 300 m. Calculate all data necessary for setting out the curves by the method of offsets from the chord produced. Assume a peg interval of 30 m. (8)
- (ii) Two straight lines AB and BC intersect at a point B of chainage 1,000 m. To avoid an obstacle, another line EF is taken to connect AB and BC, so that $\angle AEF = 135^\circ$ and $\angle EFC = 145^\circ$. The radius of the first arc is 400 m and that of the second, 200 m. Calculate the chainages of the tangent points and the point of compound curvature. (6)

(OR)

- b) Calculate the reduced levels of the various station pegs on a vertical curve connecting two uniform grades of +5% and -7%. The chainage and the reduced level of the point of intersection are 500 m and 330.750 m respectively. Take the rate of change of grade is 1% per 30 m.
