VR20 Reg. No: | | | | | | | | | | |

VELAGAPUDI RAMAKRISHNA

SIDDHARTHA ENGINEERING COLLEGE

(AUTONOMOUS)

II/IV B.Tech. DEGREE EXAMINATION, DECEMBER - 2023

Third Semester

CIVIL ENGINEERING

20CE3303 SURVEYING AND GEOMATICS

Time: 3 hours ***Max. Marks: 70***

Part-A is compulsory

Answer One Question from each Unit of Part - B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1. a. Define surveying. **(CO1 K1)**
   b. Differentiate accuracy and precision. **(CO1 K2)**
   c. What is Bench Mark? **(CO2 K1)**
   d. What is contour interval? **(CO2 K1)**
   e. What is the relation between radius and degree of a curve? **(CO3 K1)**
   f. Write the elements of a simple circular curve. **(CO3 K1)**
   g. State Simpsons rule. **(CO4 K2)**
   h. Elaborate the term EDM? **(CO5 K2)**
   i. How will you distinguish between a valley line and a ridge line? **(CO2 K2)**
   j. The staff readings on A and B are 1.730 and 0.995 respectively. Which point is higher? **(CO2 K2)**

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UNIT-IV

8. a. A railway embankment is 10 m wide with side slope 1.5 to1 assume the ground to be level in a direction traverse to the centreline, calculate the volume contained in a length of 120 m, the centre height at 20 m intervals being in meters 2.2, 3.7, 3.8, 4.0, 3.8, 3.8,2.5. **(CO4 K3) 8M**
   b. Explain the different segments of Global Positioning System in detail. **(CO5 K3) 7M**

(or)

9. a. List various methods available for finding the areas consisting regular boundary and irregular boundary. Define Simpson's rule and derive the equation to finding the area. **(CO4 K4) 7M**
   b. Explain about the applications and advantages of total station. **(CO5 K3) 8M**

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PART-B

4 x 15 = 60M

UNIT-I

2. a. Explain the different classifications of surveying. **(CO1 K2) 7M**

   b. Present an applicable method of your choice on how you will perform chaining passed the following obstacles with proper verbal and numerical illustration for any two of the following obstacles:
   i) A pond ii) A river iii) A hill iv) A tall building. **(CO1 K3) 8M**

(or)

3. a. Explain different methods of chaining on a sloping ground with the help of neat sketches. **(CO1 K2) 7M**

   b. A steel tape of 20m long standardized at 55°F with a pull of 10 kg was used for measuring a base line. Find the correction per tape length, if the temperature at the time of measurement was 80°F and the pull exerted was 16 kg. Weight of 1 cubic cm of steel = 7.86g, Wt. of tape = 0.8kg and E = $2.109 * 10^6$ kg/cm^2. Coefficient of expansion of tape per 1°F = $6.2 * 10^{-6}$. **(CO1 K3) 8M**

UNIT-II

4. a. The following consecutive readings were taken with a levelling instrument at intervals of 20 m. 2.375, 1.730, 0.615, 3.450, 2.835, 2.070, 1.835, 0.985, 0.435, 1.630, 2.255 and 3.630 m. The instrument was shifted after fourth and eighth readings. The first reading was taken on a BM of RL 112.620 m. Find the RL of all the points.
   (CO2 K3) 8M

4. b. Discuss in detail, the method of direct and indirect contouring.
   (CO2 K2) 7M

(or)

5. a. Define
   i) Levelling ii) Bench Mark
   iii) Fore Sight iv) Back Sight
   v) Datum Line vi) Line of Collimation vii) Axis of telescope
   (CO2 K2) 7M

   b. What are the various methods of locating contours? Explain in detail.
   (CO2 K2) 8M

UNIT-III

6. a. If the radius of the curve is 150 m and deflection angle is 120°, then find the following components in Simple Circular Curve:
   i) Length of the Long Chord from Centre (in m)
   ii) Length of the Long Chord (in m)
   iii) Length of the Tangent (in m)
   iv) Length of the Mid Ordinate (in m). **(CO3 K3) 8M**

   b. Define the following terms
   i) Swinging ii) Plunging iii) Ranging iv) line of sight. **(CO3 K2) 7M**

(or)

7. a. Explain the ways how to measure the horizontal angle with theodolite.
   (CO3 K2) 7M

   b. Mention brief note on any four types of horizontal curves along with neat labelled diagram showing the details: Radii, Focus Points, Tangent Points and Deflection Angle. **(CO3 K2) 8M**