

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S3 (S,FE) (FT/WP) / S1 (PT) Examination November/December 2025 (2019 Scheme)

**Course Code: CET205****Course Name: SURVEYING & GEOMATICS**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer all questions. Each question carries 3 marks*

Marks

- |    |                                                                          |     |
|----|--------------------------------------------------------------------------|-----|
| 1  | Explain (i) digital level (ii) Auto level                                | (3) |
| 2  | What are the different methods of orientation adopted in surveying?      | (3) |
| 3  | Define mass diagram. Describe its characteristics.                       | (3) |
| 4  | What is meant by a satellite station and reduction to centre?            | (3) |
| 5  | With the help of sketches, define latitude, departure and closing error. | (3) |
| 6  | Write short note on weight of an observation.                            | (3) |
| 7  | List out the angular methods of setting out simple curves.               | (3) |
| 8  | With sketches, explain the different types of circular curves.           | (3) |
| 9  | What is multispectral scanning?                                          | (3) |
| 10 | Explain (i) spatial data (ii) attribute data                             | (3) |

**PART B***Answer any one full question from each module. Each question carries 14 marks***Module 1**

- 11 a) What are the characteristics of contour? Explain with sketches. (6)
- b) The following bearings were observed with a compass. Mention which stations (8)  
were affected by local attraction and determine the corrected bearings

| Line | Fore Bearing | Back Bearing |
|------|--------------|--------------|
| AB   | 124°30'      | 304°30'      |
| BC   | 68°15'       | 246°0'       |
| CD   | 310°30'      | 135°15'      |
| DA   | 200°15'      | 17°45'       |

- 12 What are the different sources of errors in levelling? How are they eliminated? (14)

**Module 2**

- 13a) Explain (i) Mid-ordinate rule (ii) Average ordinate rule. (6)
- b) From an eccentric station S, 20 metres to the west of the main station B, the following angles were measured.  $\angle BSC = 58^\circ 32' 45''$ ,  $\angle CSA = 49^\circ 31' 27''$ . The stations S and C are to the opposite sides of line AB. Calculate the correct angle ABC if the lengths AB and BC are 1500 m and 1820 m respectively. (8)
- 14a) The following perpendicular offsets were taken at 15 m intervals from a survey line to an irregular boundary line: (7)
- 2.60, 3.95, 4.20, 2.85, 5.75, 3.60, 4.85, 5.25, 3.50
- Calculate the area enclosed between the survey line, the irregular boundary line, and the first and last offsets by (a) Average ordinate rule (b) Trapezoidal rule and (c) Simpson's rule
- b) Describe the principles of stadia and tangential tacheometry. (7)

### Module 3

- 15a) Explain how to work out the omitted measurements of a traverse for the case when length and bearing of one side has been omitted. (6)
- b) Define the term 'most probable value' and explain the method of least squares. (8)
- 16a) Find the most probable values of the angles A and B from the following observations at a station O. (8)
- $A = 11^\circ 52' 37.5''$  weight:3  
 $B = 49^\circ 27' 51.5''$  weight:2  
 $A + B = 61^\circ 20' 32.6''$  weight:4
- b) Explain (i) Bowditch method (ii) Transit method (6)

### Module 4

- 17a) Explain the working of a total station. (6)
- b) With help of neat sketch, illustrate what is transition curve. Also explain the elements of a transition curve? (8)
- 18a) Two tangents intersect at chainage 1250m. The angle of intersection is  $150^\circ$ . Calculate the tangent length, curve length, chainage of tangent points and deflection angles for setting out a curve of radius 250m. Use Rankine's method. The peg intervals may be taken as 20m. (9)
- b) Discuss in detail the concept of EDM. (5)

### Module 5

- 19a) What is meant by resolution? Explain various types of resolution. (9)
- b) What are the applications of GPS? (5)
- 20a) Differentiate between geographic and projected co-ordinate systems. (6)
- b) Explain satellite ranging. (8)

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