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University Examinations 2019/2020

SECOND YEAR, SECOND SEMESTER EXAMINATION FOR DIPLOMA IN CIVIL
ENGINEERING

ECV 2251: ENGINEERING SURVEY III

DATE: OCTOBER 2020

TIME: 1½ HOURS

INSTRUCTIONS: Answer question *one* and any other *two* questions.

QUESTION ONE (30 MARKS)

(a) Define the following terms

- i. Resection (2 marks)
- ii. Intersection (2 marks)
- iii. Global Positioning System (GPS) (2 marks)
- iv. Differential Global Positioning Systems (DGPS) (2 marks)

(b) Name four advantages of using GPS during mapping. (4 marks)

(c) Outline four the shortcoming which arises by using GPS. (2 marks)

(d) Name three segment of GPS (3 marks)

(e) Name two type of vertical curves and horizontal curves (4 marks)

(f) List six application of GPS (3 marks)

(g) Name the linear methods used for setting out simple circular curves: (2marks)

(h) the coordinate of station S, A and L are $E_s=1278.34$ m E, $N_s=1467.56$ m N , $E_A=1267.34$ m E , $N_A=987.34$ m N, $E_L=1098.34$ m E and $N_L=457.43$ m N .Calculate the coordinate of point B which has been located by nintersection from station S,A and L by observing the following angles: $\angle BSA= 79^\circ 45' 23''$, $\angle SAB=47^\circ 45' 34''$,
 $\angle BAL=34^\circ 32' 87''$ and angle $\angle ALB=69^\circ 12' 54''$ (4 marks)

QUESTION TWO (15 MARKS)

- (a) Using a well sketched diagram describe the following elements for a simple curve used in civil engineering during curve formation. (15 marks)
- i. Length of curve (l) (2 marks)
 - ii. Tangent length (T) (3 marks)
 - iii. Chainage of the tangent point (3 marks)
 - iv. Length of long cord (2 marks)
 - v. Apex distance (2 marks)
 - vi. Mid-ordinate (3 marks)

QUESTION THREE (15 MARKS)

- (a) Two roads having a deviation angle of 45° at apex point V are to be joined by a 200 m radius circular curve. If the chainage of apex point is 1839.2 m, calculate necessary data to set the curve by:
- (a) ordinates from long chord at 10 m interval (3 marks)
 - (b) method of bisection to get every eighth point on curve (4 marks)
 - (c) radial and perpendicular offsets from every full station of 30 m along tangent. (4 marks)
 - (d) offsets from chord produced. (4 marks)

QUESTION FOUR (15 MARKS)

Two tangents intersect at the chainage 1190 m, the deflection angle being 36° . Calculate all the data necessary for setting out a circular curve with radius of 300 m by deflection angle method. The peg interval is 30 m. (15 marks)