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**Question Paper Code: 44106**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Fourth Semester

Civil Engineering

14UCE406 - SURVEYING -II

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- If  $R$  is the radius of the main curve,  $\theta$  the angle of deflection,  $S$  the shift and  $L$  the length of the transition curve, then, total tangent length of the curve, is
  - $(R - S) \tan \theta/2 + L/2$
  - $(R + S) \tan \theta/2 - L/2$
  - $(R - S) \tan \theta/2 - L/2$
  - $(R + S) \tan \theta/2 + L/2$
- The curve used for ideal transition curve is a
  - cubic parabola
  - clothoid spiral
  - cubic spiral
  - lemniscate
- For a well conditioned triangle, no angle should be less than
  - $20^\circ$
  - $30^\circ$
  - $45^\circ$
  - $60^\circ$
- The setting of points in the vertical direction is usually done
  - Boning rods and travellers
  - Sight Rails
  - Slope rails or batter boards
  - all the above
- Systematic Error
  - it produces a serious effect on the final result
  - error that under the same conditions will always be of the same size and sign
  - errors that arise from inattention, inexperience, carelessness and poor judgment
  - all the above

6. Errors that arise from inattention, inexperience, carelessness and poor judgment or confusion in the mind of the observer
- (a) Accidental errors (b) Mistakes  
(c) Systematic errors (d) All the above
7. On some total stations it is possible to detach the keyboard and interchange them with other total stations and with GPS receivers. This is called
- (a) excluded surveying (b) Integrated surveying  
(c) A or B (d) None of the above
8. A \_\_\_\_\_ error exists on a total station if the 0o to 180o line in the vertical circle does not coincide with its vertical axis.
- (a) tilting axis (b) horizontal collimation  
(c) vertical collimation (d) (B) & (C)
9. Hydrographic surveys deal with the mapping of
- (a) large water bodies (b) heavenly bodies  
(c) mountainous region (d) canal system
10. Solar apparent time
- (a) calculation of the passage of time based on the Sun's position in the sky  
(b) calculation of the day time based on the Sun's position in the sky  
(c) calculation of the normal time based on the Sun's position in the sky  
(d) all the above

PART - B (5 x 2 = 10 Marks)

11. Classify the types of curves?
12. What is meant by Permanent Bench mark?
13. Differentiate between most probable error and residual error.
14. Write the Advantages of Total station survey.
15. State the differences between lunar tides and solar tides.

PART - C (5 x 16 = 80 Marks)

16. (a) Describe method of setting a simple circular curve by Rankine's deflection angle method. (16)

Or

(b) Summarize briefly the procedures for setting out compound curve. (16)

17. (a) (i) How the triangulation systems are classified? Illustrate their specifications. (8)
- (ii) Calculate sag correction for a 30 m steel under a pull of 100 N in three equal spans of 10 m each. Weight of one cubic cm of steel = 0.078 N. Area of cross section of tape = 0.08 sq.cm. (8)

Or

- (b) From a satellite station *S*, 5.8 m from main triangulation station *A*, the following directions were measured.  $A = 0^{\circ} 0' 0''$ ;  $B = 132^{\circ} 18' 30''$ ;  $C = 232^{\circ} 24' 06''$ ;  $D = 296^{\circ} 06' 11''$ ;  $AB = 3265.5$  m;  $AC = 4020.2$  m;  $AD = 3086.4$  m. Predict the directions of *AB*, *AC* and *AD* from the above given data. (16)

18. (a) Examine the most probable values of the angles *A*, *B*, *C* from the following observations at a station *P*.

$$A = 38^{\circ} 25' 20'' \text{ Weight } 1$$

$$B = 32^{\circ} 36' 12'' \text{ Weight } 1$$

$$A+B = 71^{\circ} 01' 29'' \text{ Weight } 2$$

$$A+B+C = 119^{\circ} 10' 43'' \text{ Weight } 1$$

$$B+C = 80^{\circ} 45' 28'' \text{ Weight } 2 \quad (16)$$

Or

- (b) Explain the various cases for the determination of most probable value. (16)

19. (a) Discuss about: (i) Traversing, Example of use of traversing. (ii) Classical traversing methods. (16)

Or

- (b) Illustrate the working principle and measuring principle of Electro optical surveying (Total Station) with neat sketches. (16)

20. (a) What is a three point problem in hydrographic surveying? List the various solutions for the problem? Explain in detail. (16)

Or

- (b) Estimate the hour angle and declination of a star from the following data. Altitude of the star =  $21^{\circ} 30'$  Azimuth of the star =  $140^{\circ}$  E Latitude of the observer =  $48^{\circ}$  N. (16)

