21718

3 Hours / 100 Marks   Seat No.

Instructions : (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. **Attempt any TEN of the following :** **20**

(a) State the principles of surveying.

(b) Define (i) Chaining (ii) Ranging.

(c) State the principle of optical square.

(d) Define (i) Base line (ii) Tie station.

(e) What is magnetic bearing and true bearing ?

(f) Define reciprocal levelling.

(g) What is the parallax ?

(h) Define (i) Level line (ii) Horizontal line

(i) State any two uses of contour map.

(j) Define (i) Contour interval (ii) Horizontal interval.

(k) State the principle of plane tabling.

(l) State the instrument used for cross staff survey.

(m) State any two uses of total station.

(n) State any two uses of digital planimeter.

2. **Attempt any FOUR of the following :** 16

   (a) Describe indirect ranging with neat sketch.

   (b) Differentiate between plane survey and geodetic survey.

   (c) State the types of obstacles in chaining and explain any one with neat sketch.

   (d) State the various types of tapes used in engineering field. State the relative merits and demerits of each type.

   (e) Explain the graphical method of adjustment of closing error in a closed traverse.

   (f) State advantages of auto level over dumpy level.

3. **Attempt any FOUR of the following :** 16

   (a) State any four uses of survey.

   (b) Define Orientation. State the methods of orientation and explain any one of the method.

   (c) The area of an irregular figure was measured with a planimeter having anchor point outside the figure. The initial and final readings were 4.855 and 8.754 respectively. The tracing arm was set to the natural scale. The scale of the map was 1 cm = 5 m. Find the area of the figure.

   (d) Differentiate between G.T.S. benchmark and permanent benchmark.

   (e) Convert reduced bearing to whole circle bearing :

   (i)   S 41° 45' E

   (ii) N 12° 15' W

   (f) Describe temporary adjustment of dumpy level.

4. **Attempt any FOUR of the following :** 16

   (a) Classify surveying based on (i) Instrument and (ii) Objects.

   (b) Plot the following cross-staff survey of field and calculate its area.
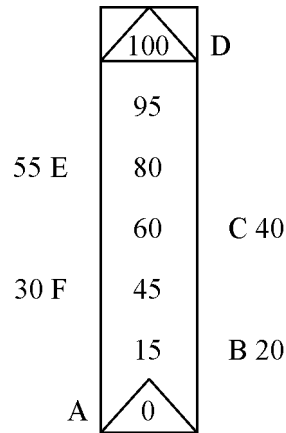
   (c) State the fundamental axis of dumpy level. State relationship between the axis when dumpy level is in perfect adjustment.

   (d) State any four characteristics of contours with neat sketches.

   (e) Describe the procedure of intersection method of plane tabling with neat sketch.

5. **Attempt any FOUR of the following :** 16

   (a) A line was measured by 20 m chain which was accurate before starting the days work. After chaining 700 m the chain was found to be 6 cm too long. After chaining a total distance of 1500 m chain it was found to be 14 cm too long. Find true distance of the line.

   (b) What are the errors that may occur in plane tabling ?

   (c) Explain with sketch method of stepping of chaining on sloping ground.

(d) Following readings were taken with dumpy level and 4m staff. The instrument was shifted after 5th readings 2.865, 3.345, 2.935, 1.950, 0.855, 2.790, 2.640 and 1.540 RL of starting station is 200 m. Calculate the R.L. of various points by plane of collimation (H.I.) method. Apply usual checks.

(e) Following are bearings observed in a closed compass traverse. Find correct bearings of the line.

Line	Fore bearing	Back bearing
PQ	124° 30'	304° 30'
QR	68° 15'	246°
RS	310° 30'	135° 15'
SP	200° 15'	17° 45'

(f) Describe temporary adjustment of dumpy level.

6. Attempt any FOUR of the following : **16**

(a) State any four components of a prismatic compass and give their uses.

(b) Differentiate between long offset and short offset.

(c) Following consecutive readings were taken with a dumpy level during a levelling work. 0.625, 0.910, 0.450, 1.240, 1.395, 0.855, 0.925, 1.110. First reading was taken on a bench mark of R.L. 100.250 and level was shifted after 5th reading during levelling work. Enter all readings in a page of level book and reduced levels of all station by rise and fall method.

(d) Describe the procedure of profile levelling for construction of a road.

(e) State any four accessories of plane table with their use.

(f) Explain the method to locate a given contour gradient in a contour plan.

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