

17451

15162

3 Hours / 100 Marks

Seat No.

--	--	--	--	--	--	--	--

- Instructions* – (1) All Questions are *Compulsory*.  
(2) Answer each next main Question on a new page.  
(3) Figures to the right indicate full marks.  
(4) 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) What is the difference between plane surveying and geodetic surveying on any two points?
- b) State the principles of surveying.
- c) Enlist the component parts of polar planimeter.
- d) State the uses of arrow and peg in surveying.
- e) Define base line and check line.
- f) Convert the following whole circle bearing into reduced bearing.
  - (i)  $120^\circ$
  - (ii)  $315^\circ$
- g) Define true meridian.
- h) Enlist the types of bench mark.
- i) State any two characteristics of contour line.
- j) In which situation intersection method of plane table surveying is suitable?

P.T.O.

- k) State any two uses of total station.
- l) How do you overcome the obstacle when chaining across a pond?
- m) Calculate the RL of B if staff readings taken from A to B were 1.250 m(A), 0.500 m, 0.750 m, 0.900 m (B) and RL of A was 215.600 m.
- n) Define contour interval and horizontal equivalent.

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

**16**

- a) Draw a neat sketch of 30 m metric chain and show the arrangement of tallies.
- b) Draw the conventional signs for
  - (i) Transmission line
  - (ii) Cultivated land
  - (iii) Orchard
  - (iv) Embankment
- c) Explain the method of chaining across a river.
- d) Before commencement of the day's work a 30m chain was found to be correct. After measuring a distance of 90 chains, chain was found to be 3 cm too short, after measuring total distance 150 chains it was found to be 6 cm too long. Determine true distance measured.
- e) State the procedure of graphical adjustment of closing error by Bowditch's rule.
- f) Differentiate between plane of collimation method and rise and fall method.

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

- a) State the uses of surveying.
- b) Explain the procedure of orientation of plane table by back sighting method.
- c) Calculate the area of figure traversed clockwise with anchor point inside and with tracing arm set to give M, the multiplying constant=100 sqcm and additive constant C=20. IR=3.436, FR=8.945. The zero mark of dial passed the fixed index mark once in reverse direction of planimeter.
- d) The following consecutive readings were taken with a dumpy level : 0.505, 0.850, 0.940, 1.050, 1.135, 0.660, 0.785, 0.800 and 1.100. The level was shifted after fifth reading. The first reading was taken on BM of RL 100.00 m, Calculate the difference of level between first and last point.
- e) State any four component parts of prismatic compass and give their uses.
- f) Describe the temporary adjustment of a level.

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

- a) Explain the chaining on sloping ground by stepping method.
- b) Define fundamental axis of dumpy level and give their relationships.
- c) Find the included angle between following lines
  - (i) N57° 30' E and S78° 00' E
  - (ii) 80° 30' and 291° 45'
- d) Explain the procedure of establishing grade contour.
- e) State the accessories used in plane table survey and give their uses.
- f) State the secondary classification of surveying.

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

- a) Explain the step by step procedure of chaining on plane ground.
- b) State the classification of levelling and explain fly levelling.
- c) State any four merits and demerits of plane table surveying.
- d) The following bearing were observed in a traverse survey conducted with prismatic compass at a place where local attractions was suspected.

Line	FB	BB
PQ	191° 45'	13° 00'
QR	39° 30'	222° 30'
RS	22° 15'	200° 30'
ST	242° 45'	62° 45'
TP	330° 15'	147° 45'

Find correct bearing of lines.

- e) The following consecutive reading were taken with a level 0.945, 0.980, 1.050, 1.120, 0.685, 0.710, 0.795, 0.815 and 0.970. The level was shifted after fourth reading. The first reading was taken on the bench mark of RL 125.000 m. Calculate the difference in level between first and last point and apply usual checks. Use rise and fall method.
- f) Plot a closed traverse and calculate the area of field if length of chainage AB is 120 m
  - (i) A tree is 35 m perpendicular from chainage of 45 m to the left of chainage AB
  - (ii) A telephone pole is 42 m perpendicular from chainage of 60 m to the right of chainage AB.
  - (iii) A corner of building is 90 m perpendicular from chainage 100 m to the left of AB.

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

- a) Convert following reduced bearing into whole circle bearings.
    - (i)  $N45^{\circ} 15' E$
    - (ii)  $S30^{\circ} 30' E$
    - (iii)  $N70^{\circ} 00' W$
    - (iv)  $S51^{\circ} 30' W$
  - b) Explain the principle of optical square with neat sketch.
  - c) Explain the procedure of differential levelling with neat sketch.
  - d) Define the following terms.
    - (i) Parallax
    - (ii) Level surface
    - (iii) Fore sight
    - (iv) Zero circle
  - e) State the uses of contour map.
  - f) Explain the procedure of intersection method of plane table surveying.
-