

Q. Consider the following surveys:

- 1. Reconnaissance survey**
- 2. Preliminary survey**
- 3. Traffic survey**
- 4. Location survey.**

The correct sequence in which these surveys are conducted before the alignment of a track is finalized, is

(a) 1, 3, 2, 4

(b) 1, 3, 4, 2

(c) 3, 1, 4, 2

(d) 3, ,1, 2, 4

Q. Match List-I (Type of Survey) with List-II (Purpose) and select the correct answer using the codes:

List - I	List – II
A. Topographical survey	1. To determine boundaries of fields, houses etc
B. Reconnaissance survey	2. To find relics or antiquity
C. Cadastral survey	3. To determine natural features of a country
D. Archaeological survey	4. To determine possibility and rough cost of the surveying system to be adopted

Codes :

A. A – 3, B – 4, C – 1, D – 2

B. A – 2, B – 4, C – 1, D – 3

C. A – 3, B – 1, C – 4, D – 2

D. A – 2, B – 1, C – 4, D – 3

Q. A scale of 1 inch = 50 ft. is mentioned on an old map. What is the corresponding equivalent scale?

(a) 1 cm = 5 m

(b) 1 cm = 6 m

(c) 1 cm = 10 m

(d) 1 cm = 12 m

Q. Which one of the following statements is correct?

(a) In a retrograde vernier, $(n - 1)$ divisions on the primary scale are divided into n divisions on the vernier scale

(b) A double vernier consists of two simple verniers placed end-to-end forming one scale with the zero in the centre

(c) In an extended vernier, $(2n + 1)$ primary divisions are divided into n divisions on the vernier

(d) In a direct vernier, $(n + 1)$ primary divisions are divided into n equal divisions on the vernier scale.

Q. Consider the following statements: The general principles of surveying are?

1. To work from part to whole

2. To locate a new station by measurements from at least two fixed reference points already established and/or identifiable.

Which of the above statements is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Q. A 30 m metric chain is found to be 0.1 m too short throughout the measurement. If the distance measured is recorded as 300 m, then the actual distance measured will be

- (a) 300.1 m**
- (b) 301.0 m**
- (c) 299.0 m**
- (d) 310.0 m**

Q. Offsets are

- (a) lateral measurements made with respect to main survey lines**
- (b) perpendiculars erected from chain lines**
- (c) taken to avoid unnecessary walking between stations**
- (d) Measurements which are not made at right angles to the chain line**

Q. Match List-I with List-II and select the correct answer using the codes given below the lists:

List - I	List - II
A. Correction for sag	1. Tacheometer
B. Least count 30'	2. Aerial photograph
C. Over lap	3. Base line
D. Addictive constant	4. Prismatic compass

Codes

A. A – 4, B – 3, C – 2, D – 1

B. A – 1, B – 2, C – 3, D – 4

C. A – 3, B – 4, C – 2, D – 1

D. A – 3, B – 4, C – 1, D – 2

Q. The true length of a line is known to be 200 m. When this is measured with a 20 m tape, the length is 200.80 m. The correct length of the 20 m tape is

(a) 19.92 m (b) 19.98 m

(c) 20.04 m (d) 20.08 m

Q. Match List-I (Corrections) with List-II (Name) and select the correct answer

List - I	List - II
A. $-L \left(1 - \frac{h}{R} \right)$	1. Sag correction
B. $-\frac{1}{2} \left(\frac{W}{P} \right)^2 \times L$	2. Pull correction
C. $\pm \alpha (t_f - T_s) L$	3. Temperature correction
D. $\pm \frac{(P - P_s)}{AE}$	4. Mean sea level correction

Codes

A. A – 4, B – 2, C – 3, D – 2

B. A – 1, B – 4, C – 3, D – 2

C. A – 4, B – 2, C – 2, D – 3

D. A – 1, B – 4, C – 2, D – 3

Q. The object of chain and cross-staff survey is to

Locate the boundaries of an area

Plot the figure to a scale

Find the area of the plot.

Find the reduced levels of the plot

Which of the above statements is / are correct?

(a) 1, 2, 3 and 4

(b) 1, 2 and 3

(c) 1 and 2

(d) 4 alone

Q. Consider the following equipments :

1. Tacheometer

2. Passometer

3. Odometer

4. Perambulator

Which of the above equipments can be employed for measurement of horizontal distance?

(a) 1 and 2 only

(b) 1 and 3 only

(c) 2 and 3 only

(d) 1, 2, 3 and 4

Q. The magnitude of 'sag correction' during measurement of lengths by taping is proportional to the :

- (a) Cube of the weight of the tape in kg per m run**
- (b) Cube root of the weight of the tape, in kg per m run**
- (c) Square of the weight (jf the tape, in kg per m run**
- (d) Square root of the weight of the tape, in kg per m run**

Q. If L is the length of the chain, W is the weight of the chain and T is the tension, the sag correction for the chain line is

A. $W^2L^2 / 24T^3$

B. $W^2L / 24T^2$

C. $W^2L^2 / 24T^2$

D. $W^2L^3 / 24T^3$

Q. In an inclined terrain, if the elevation difference between the two ends of a line is h and the inclined length of the line is L , the correction for slope is

A. H^2 / L^2

B. $H^2 / 2L^2$

C. $2H^2 / L^2$

D. $H^2 / 2L$

**Q. If "Fore bearing" of a line is S 49° 52' E
(assuming there is no local attraction), the back
bearing of the line will be**

(a) S 52° 49' E

(b) S 49° 52' E

(c) N 49° 08' E

(d) N 49° 52' W

Q. The direction of the magnetic meridian is established at each traverse station and the direction of the line is determined with reference to the magnetic meridian. This method of traversing is called.

- (a) Fast needle method**
- (b) Loose needle method**
- (c) Bearing method**
- (d) Fixed needle method**

Q. The true bearing of a line is $34^{\circ} 20' 40''$ and the magnetic declination at the place of observation is $2^{\circ} 0' 20''$ W on the date of observation. The magnetic bearing of the line is

(a) $36^{\circ} 21' 00''$

(b) $34^{\circ} 20' 20''$

(c) $32^{\circ} 20' 20''$

(d) $32^{\circ} 00' 20''$

Q. The magnetic needle in a prismatic compass is placed

- (a) AT the bottom of the graduated aluminium**
- (b) Above the graduated aluminium ring**
- (c) Below the brass box**
- (d) Below the needle lifter, but above the bottom inside the compass**

Q. Which one of the following pairs is not correctly matched?

A. Declination :Horizontal angle between magnetic meridian and true meridian

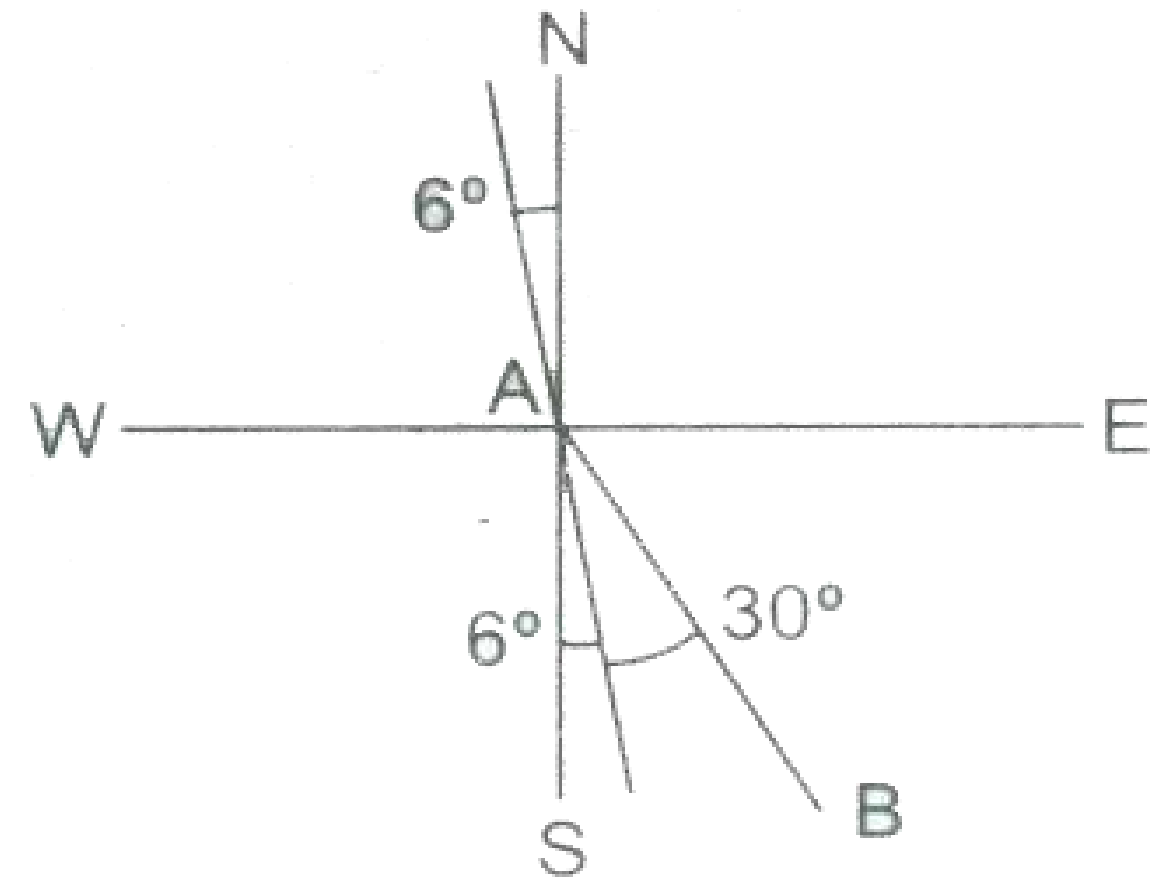
B. Bowditch's rule : Employed to adjust closing error of a closed traverse

C. Deflection angle : Measured in case of open traverse instead of measuring included angle

D. Reconnaissance survey : Employed for detailed and precise survey

**Q. The magnetic bearing of a line AB is S 30° E.
If the declination is 6° West, then what is the
true bearing?**

- (a) S 36° E**
- (b) N 36° W**
- (c) S 24° E**
- (d) N 24° W**



Q. 1. Secular

3. Annual

2. Diurnal

4. Regular

Which of these are relevant?

(a) 1, 2 and 3

(b) 1, 2 and 4

(c) 2 and 3 only

(d) 3 and 4 'only

Q. Consider the. following in the context of variations in magnetic declination:

Regarding a Prismatic Compass, which one of the following statements is correct?

- (a) The object is sighted first. The observer then moves to the side of the object vane to take the reading**
- (b) Sighting and reading are done simultaneously**
- (c) The readings are taken from the north end**
- (d) The compass has an edge bar needle**

- Q. Which one of the following statements is correct?**
- A. The axis of plate level should be parallel to the vertical axis.**
 - B. The axis of striding level must be parallel to the horizontal axis.**
 - C. The axis of the altitude level must be perpendicular to the line of collimation.**
 - D. The line of collimation must be perpendicular to the plate level axis.**

Q. Which one of the following is carried out by two theodolite method?

(a) Circular curve ranging

(b) Tacheometric survey

(c) Geodetic survey

(d) Astronomical survey

Q. Consider the following statements:

Errors eliminated by taking both face observations are those due to

- 1. horizontal axis not being perpendicular to the vertical axis**
- 2. non-parallelism of the axis of telescope level and line of collimation**
- 3. imperfect adjustment of vertical circle vernier**

Which of the above statements are correct?

(a) 1, 2 and 3

(b) 1 and 2 only

(c) 2 and 3 only

(d) 1 and 3 only

Q. In a transit theodolite, error due to eccentricity of verniers is eliminated by reading.

(a) both verniers

(b) both right swing and left swing

(c) right and left faces

(d) different parts of main scale

Q. Which of the following set of terms does not relate to operation of a theodolite?

(a) Transiting and inverting

(b) Face left and face right

(c) Right swing and left swing

(d) Gauging and sounding

Q. In a closed traverse, the sum of south latitudes exceeds the sum of north latitudes and the sum of east departures exceeds the sum of west departures. The closing line will lie in the

- (a) N-W quadrant (b) N-E quadrant**
(b) S-E quadrant (d) S-W quadrant

Q. An observer standing on the deck of a ship just sees the top of a lighthouse which is 30 m above the sea level. If the height of the observer's eye is 10 m above the sea level, then the distance of the observer from the lighthouse will be nearly.

(a) 22.5 km

(b) 24.3 km

(c) 33.3 km

(d) 59.7 km

Q. Consider the following assumptions of Bowditch method:

- 1. Angular measurements are more precise than linear measurements.**
- 2. Linear measurements are more precise than angular measurements.**
- 3. Errors in linear measurements are proportional to \sqrt{L}**
- 4. Correction to latitude or departure of any Side = Total error**
- 5. in L (or D) $\times \frac{\text{Length of the side}}{\text{perimeter of traverse}}$**

Which of these statements are correct?

(a) 1 and 4

(b) 1, 2 and 3

(c) 2, 3 and 4

(d) 3 and 4

Q. If L is the perimeter of a closed traverse, ΔD is the closing error in departure, the correction for the departure of a traverse side of length l , according to Bowditch rule, is

A. $\Delta D \cdot L / l$

B. $\Delta D \cdot l^2 / L$

C. $L l / \Delta D$

D. $\Delta D \cdot l / L$

Q. To find the RL of a roof slab of building, staff readings were taken from a particular set-up of the levelling instrument. The readings were 1.050 m with staff on the Bench Mark and 2.300 m with staff below the roof slab and held inverted. Taking the RL of the Bench Mark as 135.15 m, the RL of the roof slab will be

(a) 129.800

(b) 131.900

(c) 134.400

(d) 138.500

**Q. Two point A and Bare 1530 m apart across a river.
The reciprocal levels measured are:**

Level at	Reading on (in m)	
	A	B
A.	2.165	3.810
B.	0.910	2.355

The true difference in level between A and B would be

(a) 1.255 m

(b) 1.455 m

(c) 1.545 m

(d) 1.645

Q. The arithmetical check for the computation of RL. by "rise and fall" method is given by

(a) $\sum \text{F.S.} - \sum \text{B.S.} = \text{R L. of last station point} - \text{RL. of first station point} = \sum \text{Fall} - \sum \text{Rise}$

(b) $\sum \text{B.S.} - \sum \text{F. S.} = \text{R L. of first station point} - \text{RL. of last station point} = \sum \text{Rise} - \sum \text{Fall}$

(c) $\sum \text{B.S.} - \sum \text{F.S.} = \text{R L. of last station point} - \text{RL. of first station point} = \sum \text{Rise} - \sum \text{Fall}$

(d) $\sum \text{B.S.} - \sum \text{F.S.} = \sum \text{Rise} - \sum \text{Fall} = \text{R L. of first station point} - \text{RL. of last station point}$

- Q. The sensitiveness of a bubble tube in a level would decrease if**
- A. The radius of the curvature of the internal surface of the tube is increased**
 - B. The diameter of the tube is increased**
 - C. The length of the vapour bubble is increased**
 - D. The viscosity of the liquid is increased**

Q. Which one of the following methods of levelling eliminates the error due to curvature and refraction?

(a) Fly levelling

(b) Levelling by equalizing the distances of backsight and foresight

(c) Check levelling

(d) Precise levelling

Q. Consider the following statements:

In surveying operations, the word 'reciprocal' can be associated with

1. Ranging 2. levelling 3. contouring

Which of the above statements is/are correct?

- (a) 1 only**
- (b) 1 and 2 only**
- (c) 2 and 3 only**
- (d) 1, 2 and 3**

Q. Which of the following sights will be applicable for a change point?

(a) Back sight

(b) Intermediate sight and fore sight

(c) Fore sight

(d) Back sight and fore sight

Q. In case of levelling, backsight is

- (a) A fixed point of known elevation**
- (b) The last staff reading taken before shifting the instrument**
- (c) The first staff reading taken after setting the instrument**
- (d) Any staff reading taken on a point of unknown elevation**

Q. The combined correction for curvature and refraction for a distance of 1400 m is

(a) 0.153m

(b) 0.132 m

(c) 0.094 m

(d) 0.021 m

Q. For better accuracy in measuring and plotting the sides of a triangle by triangulation, the angles of the triangle

(a) should not be more than 30°

(b) should not be less than 30° or more than 120°

(c) are not restricted in magnitude

(d) should not be less than 120°

Q. Theory of errors and adjustments deals with minimizing the effects of

(a) Instrumental errors

(b) Mistakes

(c) Systematic errors

(d) Personal and accidental errors

Q. From the probability equation it is found that the most probable values of series of errors arising out of the observations of equal weight are those for which the sum of their squares is

- (a) zero**
- (b) Infinity**
- (c) Minimum**
- (d) Maximum**

Q. The measured radius of a circle is 80 m with a possible error of 0.05 m in its diameter. The error in the computed area will nearly be

(a) + 6.5 m²

(c) ± 12.6 m²

(b) - 0.65 m²

(d) ± 8.2 m²

Q. A lemniscate curve between the tangents is transitional throughout, if the polar deflection angle of its apex is equal to (4) is the deflection angle between the initial and final tangents)

If g_1 and g_2 are the two gradients, r is the rate of change of grade (%) per chain, the length of the vertical curve will be'

A. $\left(\frac{g_1 + g_2}{r^2} \right)$

B. $\left(\frac{g_1 + g_2}{\sqrt{r^2}} \right)$

C. $\left(\frac{g_1 + g_2}{r} \right)$

D. $\frac{\sqrt{g_1 + g_2}}{r^3}$

Q. A 3% downgrade curve is followed by a 1% upgrade curve and rate of change of grade adopted is 0.1 % per 20m length. The length of the respective vertical curve is :

- (a) 800 m**
- (b) 200 m**
- (c) 100 m**
- (d) 400 m**

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- (a) 800 m**
- (b) 200 m**
- (c) 100 m**
- (d) 400 m**

Q. If the angle of deflection of a simple curve is e and its radius is R , then the length of the chord is

A. $2R \sin \theta$

B. $2R \sin \theta / 2$

C. $2R \tan \theta$

D. $2R \tan \theta / 2$

Q. Which one of the following methods estimates best the area of an irregular and curved boundary?

(a) Trapezoidal method

(b) Simpson's method

(c) Average ordinate method

(d) Mid-ordinate method

Q. 43560 sq. ft.

1. 40 gunthas 10 sq.

2. Gunter's chain

3. 4850 sq. yds.

Select the correct answer using the code given below:

(a) 1, 2 and 3

(b) 2, 3 and 4

(c) 1, 2 and 4

(d) 1, 3 and 4

Q. Which one of the following methods of computing area assumes that the short lengths of the boundary between the ordinates are parabolic arcs?

(a) Average ordinate rule

(b) Middle ordinate rule

(c) Simpson's rule

(d) Trapezoidal rule

Q. For locating an inaccessible point with the help of only a Plane table, one should use

(a) traversing (b) resection

(c) radiation (d) intersection

Q. The process of determining the location of the station (on the map) occupied by the plane table is called as

- (a) Intersection**
- (b) Three-point problem**
- (c) Traversing**
- (d) Resection**

Q. Which one of the following surveys employs alidade?

(a) Contour survey

(b) Archaeological survey

(c) Plane table survey

(d) Reconnaissance survey

Q. Which one of the following errors is more severe in plane table surveying?

(a) Defective sighting

(b) Defective orientation

(c) Movement of board between sights

(d) Non-horizontality of board when points sighted are at large differences of their elevation

Q. In a solution of the three-point problem in plane table surveying, the converging of error is attained through:

- (a) Concyclic concept**
- (b) Bessel's method**
- (c) Triangle of error**
- (d) Tracing paper method**

Q. In a plane-table survey, the process of determining the plotted position of a station occupied by the plane-table by means of sights taken towards known points, the locations of which have already been plotted, is known as

(a) Radiation

(b) Resection

(c) Intersection

(d) Traversing

Q. What is the angle of intersection of a contour and a ridge line?

(a) 30°

(b) 0°

(c) 180°

(d) 90°

Q. A contour may be defined as an imaginary line passing through

(a) Points on the longitudinal section

(b) Points of equal elevation

(c) Point of equal local ground slope

(d) Point of transverse section surveys

Q. A closed contour line with two or more higher contours inside it will represent a

(a) Depression

(b) Hill

(c) Cave

(d) Well

Q. Match List-I with List-II and select the correct answer using the codes given below the lists:

List - I	List - II
A. Clinometer	1. Area measuring instrument
B. Pantagraph	2. Gradient finding instrument
C. Tellurometer	3. Plan enlarging instrument
D. Ghat tracer	4. Microwave instrument

Codes :

- a. A – 1, B – 2, C – 5, D – 2**
- b. A – 3, B – 4, C – 1, D – 2**
- c. A – 1, B – 5, C – 4, D – 3**
- d. A – 3, B – 4, C – 5, D – 2**

Q. Which one of the following verniers is employed in Abney Level?

(a) Retrograde vernier

(b) Double vernier

(c) Double folded vernier

(d) Extended vernier

Q. Which one of the following instruments can be used as a clinometer?

(a) Prism square

(b) Line ranger

(c) Abney level

(d) Optical square

Q. For setting out right angles, the instrument used is

(a) Optical square

(b) Abney level

(c) Alidade

(d) Ceylon ghat tracer

Q. Which of the following minor instruments are used for setting out right angles in chain surveying?

- 1. Cross staff**
- 2. Optical square**
- 3. Prism square**
- 4. Auto level**

(a) 1 and 2 only

(b) 1, 2 and 3

(c) 2 and 3 only

(d) 2, 3 and 4 only

- Q. Theory of probability is applied to**
- a. Accidental errors only**
 - b. Cumulative error only**
 - c. Both accidental and cumulative error**
 - d. None of the above**

Q. The difference between the most probable value of a quantity and its observed value is

- a. True error**
- b. Weighted observation**
- c. Conditional error**
- d. Residual error**

Q. Geodetic surveying is different from plane surveying because of

- a. The curvature of the earth**
- b. The large difference of elevations between various points**
- c. Coverage of very large area**
- d. Undulations of very large area**

Q. Which of the following instrument is generally used for base line measurements ?

- a. Chain**
- b. Metallic tape**
- c. Steel tape**
- d. Invar tape**

Q. 'Ranging' is the process of

- a. Fixed ranging rods on the extremities of the area**
- b. Aligning the chain in a straight line between two extremities**
- c. Taking offsets from a chain line**
- d. Chaining over a range of mountains**

Q. The main object of running a tie line is

A. To check accuracy of work

B. To take details of nearby objects

C. To take offsets for details surveying

D. None of the above

Q. Which of the following angles can be set out with the help of French cross staff ?

A. 45° only

B. 90° only

C. Either 45° or 90°

D. Any angle

Q. The correction for sag is

a. Always additive

b. Always subtractive

c. Always zero

d. Sometimes additive and sometimes subtractive

Q. Which of the following is not used in measuring perpendicular offsets ?

A. Line ranger

B. Steel tape

C. Optical square

D. Cross staff

Q. The length of a chain is measured from

- a. Centre of one handle to centre of other handle**
- b. Outside of one handle to outside of other handle**
- c. Outside of one handle to inside of other handle**
- d. Insider of one handle to insider of other handle**

Q. In the prismatic compass

- a. The magnetic needle moves with the box**
- b. The line of the sight does not move with the box**
- c. The magnetic needle and graduated circle do not move with the box**
- d. The graduated circle is fixed to the box and the magnetic needle always remains in the N-S direction.**

Q. The horizontal angle between the true meridian and magnetic meridian at a place is called

- a. Azimuth**
- b. Declination**
- c. Local attraction**
- d. Magnetic bearing**

Q. The graduations in prismatic compass

i) are inverted

ii) are upright

iii) run clockwise having 0 at south

iv) run clockwise having 0 at north

the correct answer is

a. (i) and (iii)

c. (i) and (iv)

b. (ii) and (iii)

d. (ii) and (iv)

Q. The process of turning the telescope about the vertical axis in horizontal plane is known as

A. Transiting

B. Reversing

C. Plunging

D. swinging

Q. Size of a theodolite is specified by

A. The length of telescope

B. The diameter of vertical circle

C. The diameter of lower plate

D. The diameter of upper plate

Q. The cross hairs in the surveying telescope are placed

A. Midway between eye piece and objective lens

B. Much closer to the eye-piece than to the objective lens

C. Much closer to the objective lens than to the eye piece

D. Anywhere between eye-piece and objective lens

Q. A 'level line' is a

- a. Horizontal line**
- b. Line parallel to the mean spheroidal surface of earth**
- c. Line passing through the centre of cross hairs and the centre of eye piece**
- d. Line passing through the objective lens and the eye-piece of a dumpy or tilting level**

Q. The difference between a level line and a horizontal line is that

- a. Level line is a curved line while horizontal line is a straight line**
- b. Level line is normal to plumb line while horizontal line may not be normal to plumb line at the tangent point to level line**
- c. Horizontal line is normal to plumb line while level line may not be normal to the plumb line**
- d. Both are same**

Q. Refraction correction

- a. Completely eliminates curvature correction**
- b. Partially eliminates curvature correction**
- c. Adds to the curvature correction**
- d. Has no effect on curvature correction**

Q. The correction for refraction as applied to staff reading is

A. $+\frac{1}{7} \left(\frac{d^2}{2R} \right)$

B. $-\frac{1}{7} \left(\frac{d^2}{2R} \right)$

C. $+\frac{1}{7} \left(\frac{d^2}{R} \right)$

D. $-\frac{1}{7} \left(\frac{d^2}{R} \right)$

Q. Sensitiveness of a level tube is designated by

- a. Radius of level tube**
- b. Length of level tube**
- c. Length of bubble of level tube**
- d. None of the above**

Q. A series of closely spaced contour lines represents a

- a. Steep slope**
- b. Gentle slope**
- c. Uniform slope**
- d. Plane surface**

Q. Which of the following methods of contouring is most suitable for a hilly terrain

A. Direct method

B. Square method

C. Cross- sections method

D. Tachometric method

Q. The size of plane table is

a. 750 mm * 900 mm

b. 600 mm * 750 mm

c. 450 mm * 600 mm

d. 300 mm * 450 mm

**Q. After fixed the plane table to the tripod,
the main operations which are needed at
each plane table station are**

i) leveling

ii) orientation

iii) centering

the correct sequence of these operations is

a. (i), (ii), (iii)

c. (i), (iii), (ii)

b. (iii), (i), (ii)

d. (ii), (iii), (i)

Q. The Bowditch method of adjusting a traverse is based on the assumption that

- a. $e_1 \propto \sqrt{l}$ and $e_2 \propto \frac{1}{\sqrt{l}}$
- b. $e_1 \propto \sqrt{l}$ and $e_2 \propto \sqrt{l}$
- c. $e_1 \propto \frac{1}{\sqrt{l}}$ and $e_2 \propto \sqrt{l}$
- d. $e_1 \propto \frac{1}{\sqrt{l}}$ and $e_2 \propto \frac{1}{\sqrt{l}}$

Where e_1 and e_2 are error in linear and angular measurements respectively and l is the length of a line

Q. The multiplying constant of a theodolite is

a. f/l

b. $(f + d)$

c. $\frac{f}{i} + d$

d. $\frac{f}{d} + 1$

Q. If the degree of a curve is 1 , then radius of the curve is equal to

a. 5400 m

b. 1720 m

c. $1720 / \pi$ m

d. $3440 / \pi$ m

Q.The radial offset at a distance X from the point of commencement of curve of radius R is given by

a. $\sqrt{R^2 - X^2} - R$

b. $R - \sqrt{R^2 - X^2}$

c. $R - \sqrt{R^2 + X^2}$

d. $\sqrt{R^2 + X^2} - R$

Q. A curve tangential to four straight lines and consisting of arcs of different radii is known as

- a. One centered compound curve**
- b. Two centered compound curve**
- c. Three centered compound curve**
- d. Four centered compound curve**

Q. If the focal length of the object glass is 25 cm and the distance from object glass to the trunnion axis is 15 cm, 0.1

A. 0.4

B. 0.6

C. 1.33

D. the additive constant is

Q. The shape of the vertical curve generally provided is

- a. Circular**
- b. Parabolic**
- c. Spiral**
- d. elliptical**

Q. The maximum value of centrifugal ratio on roads and railways respectively are taken as

A. $1/4$ and $1/6$

B. $1/6$ and $1/8$

C. $1/4$ and $1/8$

D. $1/8$ and $1/4$

Q. An imaginary line passing through the optical centre of the objective and the optical centre of the eye=piece in the telescope or a surveying instrument is called the

A. Horizontal axis

B. Line of collimation

C. Optical axis of the telescope

D. Reference axis

Q. During the measurement of a line by chain or tape in slopes, if the length of the line is 'l' and height difference between the ends of the line is 'h' then correction to the measured length is more than $h^2 / 2l$ by

A. Zero

B. $+ h^4 / 8l^3$

C. $+ h^3 / 4l^2$

D. $- h^3 / 2l^2$

Q. A survey done to understand the heavenly bodies is known as

A. Celestial survey

B. Astronomical survey

C. Photographic survey

D. Aerial survey

Q. Hydrographic survey deals with the mapping of.....

A. Large water bodies

B. Canal system

C. Colour movement

D. None of these

Q. What is the difference between the sum of interior angles of plane triangle and spherical triangle for area of triangle 195 square kilometer on the Earth's surface?

A. One degree

B. One minute

C. One second

D. One radian

- Q. In case of case a directly Vernier scale.....**
- a. Graduations increase in opposite direction in which graduations of the main scale increase**
 - b. Smallest division is longer than smallest division of the main scale**
 - c. Graduation increase in the same direction in which graduation of the main scale increase**
 - d. None of these.**

Q. Gunter's chain..... m long

a. 23.12

b. 21.12

c. 22.12

d. 20.12