

GOVT. POLYTECHNIC MAYURBHANJ

TIKARPADA



DEPARTMENT OF CIVIL ENGINEERING

QUESTION BANK FOR THE SUBJECT OF:

SUBJECT: LAND SURVEYING-I

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SEMESTER: 4TH

Question Banks (4th Sem)

Introduction to surveying, Linear Measurement :-

(2 Marks)

- ① Define surveying.
- ② Differentiate betⁿ surveying & Levelling.
- ③ What is the principle of surveying?
- ④ Differentiate betⁿ Plane surveying & geodetic surveying.
- ⑤ Define accuracy.
- ⑥ Define precession.
- ⑦ Define 'one link'.
- ⑧ How to unfold a chain?
- ⑨ How to fold a chain?
- ⑩ How to test a chain?
- ⑪ Define leader.
- ⑫ Define follower.
- ⑬ ~~Hypotenusal~~ Define hypotensional allowance.

(5 Marks)

- ① Explain principle of surveying.
- ② What are the types of chains?
- ③ What are the types of tapes?
- ④ Explain the errors of linear measurement/surveying.
- ⑤ What are the methods of linear measurement.
- ⑥ A line was measured by a 30m chain which was accurate before starting the day's work. After chaining 800m, the chain was found to be 4cm too short. After chaining a total distance of 1625m. The chain was found to be 12cm too short. Find the true distance of the line.

⑦ The distance betⁿ two station 1000m when measured with a 20m chain. The same distance when measured with a 30m chain was found to be 990m. If the 20m chain was 0.04m too long, what was the error in 30m chain?

(10 marks)

① A steel tape was exactly 30m long at 20°C when supported throughout its length under a pull of 5 kg, a line measured with this tape under a pull of 10kg & at a mean temp^r of 32°C was found to be 750m long. Assume the tape is supported at every 30m. Find the true length of the line.

Given data c/s area of the tape = 0.06 cm^2 .

$$E = 2.1 \times 10^6 \text{ kg/cm}^2, \alpha = 11 \times 10^{-6} \text{ per degree centigrade},$$

$$\omega = 10 \text{ g/cc.}$$

② A 30m steel tape was standardized at a temp^r of 20°C & under a pull of 10kg. The tape was used in catenary at a temp^r of 25°C & under pull of P kg. The cross-sectional area of the tape is 0.03 cm^2 , its weight per unit length was 22 g/m , $E = 2 \times 10^6 \text{ kg/cm}^2$, $\alpha = 11 \times 10^{-6} \text{ per } ^\circ\text{C}$. Find the correct horizontal distance if P is (a) 10 kg, (b) 15 kg.

③ A steel tape was accurately 30m long at 20°C when supported throughout it's length under a pull of 10kg. A line was measured with the tape under a pull of 10kg at a mean temp^r of 30°C & found to be 780m long. The c/s area of the tape = 0.05 cm^2 & its total weight 0.693 kg , α for steel = $11 \times 10^{-6} / ^\circ\text{C}$ & $E = 2.1 \times 10^6 \text{ kg/cm}^2$. Compute the true length of the line, if the tape was supported during measurement.

(a) At every 30m

(b) At every 15m

Chaining & Chain Surveying :-

(2 Marks)

- ① Define ranging.
- ② What is the principle of chain surveying?
- ③ Define 'well-conditioned triangle'.
- ④ Define 'ill-conditioned triangle'.
- ⑤ Define Index sketch.
- ⑥ Define reconnaissance survey.
- ⑦ Define field book.
- ⑧ Differentiate single line field book & double line field book.

(5 Marks)

- ① What are the types of ranging & explain one of it.
- ② What are the obstacles in chaining & explain one of it.
- ③ The following slope distances were measured along a chain line with a 20m tape. Slope distances (in mtr.s) = 18.5, 19.5, 16.3, 14.8 & 13.9. Difference of elevation betⁿ ends (in mtr) = 1.35, 2.50, 4.20, 2.45 & 3.25. It was noted afterwards that the tape was 2.5 cm too long. Find the true horizontal distance.
- ④ The following distance were measured along a chain line with a 30m chain.

Slope distance	Angle of slope
25.8m	10°
23.5m	5°
22.9m	7°
26.6m	12°

It was noted afterwards that the chain was 0.03m too long. Find the true horizontal distance.

- ⑤ What are the guidelines to decide no. of offset?
⑥ Explain different types of cross-staff.

{10 Marks}

- ① Define its optical square & explain its internal arrangement & function.
② What are the points remembered for selection of survey station?

Angular measurement & Compass Surveying

{2 Marks}

- ① Define compass traversing / surveying.
② Define azimuth.
③ Define whole circle bearing.
④ Define quadrant bearing.
⑤ Define reduced bearing.
⑥ Differentiate fore bearing & back bearing.
⑦ Define magnetic declination.
⑧ Differentiate magnetic declination east & magnetic declination west.
⑨ Differentiate Isogonic & Agonic line.
⑩ Define dip of magnetic needle.
⑪ Define local attraction.
⑫ Define traversing.
⑬ Differentiate open traverse & closed traverse.

{5 Marks}

- (i) Convert the WCBs to QBs :- WCB of AB, BC, CD, DF are $200^\circ 10'$, $100^\circ 10'$, $45^\circ 10'$, $272^\circ 10'$ respectively.
(ii) Convert the QBs to WCBs :- QB of line AB, BC, CD, DE are N $50^\circ 20'W$, N $50^\circ 30'E$, S $30^\circ 30'W$, S $70^\circ 20'E$ respectively.
(iii) Convert fore bearing to back bearing:-

FB of Line AB = $300^{\circ} 30'$

FB of line AC = N $60^{\circ} 30'$ E.

- ② Explain the variation of magnetic declination.
- ③ Explain the prismatic compass with neat sketch.
- ④ Differentiate prismatic compass & surveyor's compass.
- ⑤ The true bearing of line AB, BC, CD & DE are $45^{\circ} 45'$, $120^{\circ} 20'$, $200^{\circ} 20'$ & $280^{\circ} 40'$ respectively. Find the angle LB, LC & LD.

Plane table surveying :-

(2 Marks)

- ① Define plane table surveying.
- ② Define/What is the principle of plane table surveying.
- ③ Define fiducial edge.
- ④ Define orientation.

(5 Marks)

- ① Describe the accessories used in plane table surveying.
- ② What are the method of orientation & explain one of it.
- ③ What are the method of plane table surveying & explain one of it.

(10 Marks)

- ① Describe two point problem in plane table surveying.
- ② Describe three point problem in plane table surveying.
- ③ What are the methods of plane table surveying & explain two of them.
- ④ What are the precaution to be taken in plane table surveying?

Levelling :-

{ 2 Marks }

- ① Define levelling.
- ② Define datum surface/line.
- ③ Define reduced level.
- ④ Differentiate axis of telescope & axis of bubble tube.
- ⑤ Define change point.
- ⑥ Define height of instrument.
- ⑦ Define line of collimation.
- ⑧ How to do the focussing operation?
- ⑨ How to remove the parallax?
- ⑩ Define parallax.
- ⑪ Define sensitiveness of bubble.
- ⑫ What is the statement of principle of reversal?

{ 5 Marks }

- ① Define Benchmark & what are the types of bench mark.
- ② Explain the different types of level.
- ③ Explain the temporary adjustment of the level instrument.
- ④ Differential the rise & fall method and height of the instrument method / collimation method.

{ 10 Marks }

- ⑤ Explain the permanent adjustment of the level.

{ 10 Marks }

- ① Describe the constructional details of dumpy level with neat sketch.
- ② Explain the different types of levelling.
- ③ The following consecutive reading were taken with leveling instrument at interval of 20 m.
2.375, 1.750, 0.605, 3.400, 2.820, 2.050, 1.805, 0.985, 0.430, 1.620, 2.255 and 3.330 m.

This instrument was shifted after the 4th reading & 8th reading. The first reading was taken on benchmark of RL 100.250 m. Find the RLs of all points.

Q. 4 :- The following consecutive readings were taken with a dumpy level ~~at~~ along a chalkline at a common interval of 15 m. The first reading was at a change of 165 m where RL is 99.085 m. The instrument was shifted after the 4th & 9th reading. The readings are 3.100, 2.250, 1.120, 9.800, 3.120, 2.765 1.885, 1.475, 1.960, 1.225, 3.220 and 3.035 m. Find out the RLs of all points by using suitable method.

Q. 5

Explain the difficulties of levelling.

End

Theodolite Surveying and Traversing:-

Each question carry 2 marks :-

- Q. 1. (a) Define theodolite Surveying.
(b) What are the uses of Theodolite.
(c) Define transite theodolite.
(d) Define Non-transite theodolite.
(e) What are the fundamental access ~~or~~ or lines of theodolite.
(f) Define stadia setting.
(g) Define swinging of telescope.
(h) Differentiate between face left and face right.
(i) Write the Bow-ditch rule formula applied for balancing the traverse.
(j) Define latitude & departure.

Each question carry 5 marks.

- Q. 2 (a) Explain the transite theodolite with neat sketch.
- (b) Describe about the ~~various~~ various errors in theodolite.
- (c) Describe the procedure to measure the vertical angle of the theodolite.
- (d) Write Bow-ditch rule for balancing a traverse.

Each question carry 10 marks:-

Q. 3 (a) Describe about the procedure to measure the horizontal angle of the theodolite.

- (b) For the following traverse Compute the length CD, so that A, D and E may be in one straight line.

Line (A)	Length (L)	Bearing
AB —	110	83° 12'
BC —	165	32° 42'
CD — ?		346° 06'
DE —	212	16° 18'

Computation of Area & volume :-

(2 Marks)

- ① Define Simpson's rule.
- ② Define mid-ordinate rule in computation of area.
- ③ Differentiate bet' trapezoidal & Simpson's rule.

(5 Marks)

- ① The consecutive co-ordinates of a closed traverse ABCD are as follows. Compute the area by double meridian distance method.

<u>Side</u>	<u>Latitude</u>	<u>Departure</u>
AB	+108 m	+14 m
BC	+25 m	+230 m
CD	-153 m	+13 m
DA	-20 m	-257 m

- ② find the area of closed traverse by calculation of area by co-ordinate method.

<u>Side</u>	<u>Latitude</u>	<u>Departure</u>
AB	+225.5	+120.5
BC	-245.05	+210.0
CD	-150.5	110.5
DA	+170.0	-220.0