

National Examination Board (NEB)
CLASS 10
ENGINEERING SURVEYING I

SEE PREPARATION
PRACTICE SET COLLECTION
2081

PREPARED BY:
Er. Pratham Acharya
Instructor
Shree Bhutandevi Secondary School
(Technical School), Hetauda

MULTIPLE CHOICE QUESTIONS

SET A

1. The length and number of links of Gunter's chain is
 - a. 33 ft, 100 links
 - b. 66 ft, 100 links
 - c. 33 ft, 150 links
 - d. 66 ft, 150 links
2. The length and breadth of field book is
 - a. 10 cm × 20 cm
 - b. 10 cm × 24 cm
 - c. 12 cm × 20 cm
 - d. 12 cm × 24 cm
3. If the fore bearing of a line is found to be $230^{\circ}45'$, what would be its back bearing?
 - a. $50^{\circ}45'$
 - b. $39^{\circ}15'$
 - c. $230^{\circ}45'$
 - d. $129^{\circ}15'$
4. When a convenient direction is assumed to be the meridian for measuring directions, the meridian is called
 - a. True Meridian
 - b. Grid Meridian
 - c. Arbitrary meridian
 - d. Magnetic Meridian
5. The vertical cross hair of a prismatic compass is attached to the
 - a. Object vane
 - b. Sight vane
 - c. Eyepiece vane
 - d. Triangular Prism
6. The imaginary level surface with reference to which vertical distances of the points are measured is
 - a. Bench Mark
 - b. Elevation
 - c. Reduced Level
 - d. Datum
7. In HI method of reducing level, the HI is calculated by
 - a. Adding backsight to the foresight
 - b. Subtracting foresight from RL
 - c. Adding backsight to the elevation
 - d. Subtracting backsight from RL
8. The refraction correction in levelling is given by formula
 - a. $0.0112d^2$ (+ve)
 - b. $0.0112d^2$ (-ve)
 - c. $0.0785d^2$ (+ve)
 - d. $0.0785d^2$ (-ve)
9. Which of the following is not the instrumental error in levelling?
 - a. Shaky tripod
 - b. Defective level tube
 - c. Imperfect adjustment of level
 - d. Errors in reading staff

SET B

10. The length and number of links of Gunter's chain is
 - a. 33 ft, 100 links
 - b. 66 ft, 100 links
 - c. 33 ft, 150 links
 - d. 66 ft, 150 links
11. The length and breadth of field book is
 - a. 10 cm × 20 cm
 - b. 10 cm × 24 cm
 - c. 12 cm × 20 cm
 - d. 12 cm × 24 cm
12. If the fore bearing of a line is found to be $230^{\circ}45'$, what would be its back bearing?
 - a. $50^{\circ}45'$
 - b. $39^{\circ}15'$
 - c. $230^{\circ}45'$
 - d. $129^{\circ}15'$
13. When a convenient direction is assumed to be the meridian for measuring directions, the meridian is called
 - a. True Meridian
 - b. Grid Meridian
 - c. Arbitrary meridian
 - d. Magnetic Meridian
14. The vertical cross hair of a prismatic compass is attached to the
 - a. Object vane
 - b. Sight vane
 - c. Eyepiece vane
 - d. Triangular Prism
15. The imaginary level surface with reference to which vertical distances of the points are measured is
 - a. Bench Mark
 - b. Elevation
 - c. Reduced Level
 - d. Datum
16. In HI method of reducing level, the HI is calculated by
 - a. Adding backsight to the foresight
 - b. Subtracting foresight from RL
 - c. Adding backsight to the elevation
 - d. Subtracting backsight from RL
17. The refraction correction in levelling is given by formula
 - a. $0.0112d^2$ (+ve)
 - b. $0.0112d^2$ (-ve)
 - c. $0.0785d^2$ (+ve)
 - d. $0.0785d^2$ (-ve)
18. Which of the following is not the instrumental error in levelling?
 - a. Shaky tripod
 - b. Defective level tube
 - c. Imperfect adjustment of level
 - d. Errors in reading staff

SET C

19. The longest line in chain surveying is
 - a. Check line
 - b. Subsidiary line
 - c. Tie line
 - d. Base line
20. The figure below is the conventional symbol for
 - a. Pond
 - b. Hospital
 - c. Temple
 - d. School
21. The horizontal angle between the true meridian and the survey line is called
 - a. True Bearing
 - b. Magnetic Bearing
 - c. Arbitrary Bearing
 - d. Grid Bearing
22. Convert 265° into QB.
 - a. $N85^\circ E$
 - b. $S85^\circ E$
 - c. $S85^\circ W$
 - d. $N85^\circ W$
23. When the bearings of start and end points of a compass surveying traverse is known, the traverse is called
 - a. Open Traverse
 - b. Known Traverse
 - c. Closed Traverse
 - d. Unknown Traverse
24. The relatively permanent and fixed reference point whose elevation is known is called
 - a. Datum
 - b. Reduced Level
 - c. Benchmark
 - d. Focus Point
25. The height of instrument in levelling is calculated by using formula
 - a. $HI = RL \text{ of BM} - BS$
 - b. $HI = RL \text{ of BM} + BS$
 - c. $HI = RL \text{ of BM} - FS$
 - d. $HI = RL \text{ of BM} + FS$
26. The value of RL at datum (mean sea level) is
 - a. 0 m
 - b. 3.14 m
 - c. 5 m
 - d. None of the above
27. Focusing the eyepiece lens and focusing the objective lens is done in levelling to
 - a. Reduce effort
 - b. Eliminate intermediate sights
 - c. Eliminate the parallax
 - d. Reduce intermediate sights



SET D

28. The scale of a drawing is given as 1:20. What is the representative fraction?
 - a. 20
 - b. 1/20
 - c. 0.5
 - d. 0.02
29. Which of the following accessories is not used for distance measurement?
 - a. Arrow/peg
 - b. Chain/tape
 - c. Current meter
 - d. Ranging Rods
30. Pacing may be done with a precision of
 - a. 1/100
 - b. 1/150
 - c. 1/200
 - d. 1/250
31. The SI unit of measurement of temperature is
 - a. ° C
 - b. ° F
 - c. K
 - d. R
32. 2.5 dhur is equal to
 - a. 425.655 sq.ft.
 - b. 455.625 sq.ft.
 - c. 465.255 sq.ft.
 - d. 455.652 sq.ft.
33. The degree of closeness between a measurement and its true value is
 - a. Error
 - b. Correction
 - c. Precision
 - d. Accuracy
34. Sag correction is always
 - a. positive
 - b. negative
 - c. greater than 1
 - d. none of the above
35. Which of the following is not natural source of error?
 - a. Humidity
 - b. Curvature of earth
 - c. Refraction
 - d. Inaccurate centering
36. _____ is used to measure slopes and vertical angles.
 - a. Prism Reflector
 - b. Compass
 - c. Abney Level
 - d. Tape

SET E (Regular 2080)

37. What is surveying?
 - a. Surveying is the process of finding area of land
 - b. Surveying is the process to find the relative position of a point on or beneath the surface of the earth
 - c. Surveying is the examination of students
 - d. Surveying is the process of making map
38. What is the main principle of surveying?
 - a. Working from part to parts
 - b. Working from part to whole
 - c. Working from whole to part
 - d. Working from whole to whole
39. Which one is the accessory for distance measurement?
 - a. Compass
 - b. Level machine
 - c. Ranging rod
 - d. Plane table
40. How many numbers of links are there in 20m metric chain?
 - a. 100
 - b. 150
 - c. 200
 - d. 300
41. Which of the following instrument is not required in chain survey?
 - a. Dumpy level
 - b. Ranging rod
 - c. Chain
 - d. Peg
42. The angles in well-conditioned triangle of chain surveying is
 - a. more than 30° and less than 120°
 - b. less than 60° and more than 120°
 - c. less than 30° and more than 120°
 - d. more than 60° and less than 120°
43. The instrument used to measure meridian is
 - a. ranging rod
 - b. compass
 - c. level
 - d. chain
44. The last staff reading taken from every setup of an instrument is known as
 - a. B.S.
 - b. I.S.
 - c. F.S.
 - d. Line of sight
45. A relatively fixed point of known elevation (R.L.) above datum is called
 - a. Line of sight
 - b. B.S.
 - c. Bench mark
 - d. Datum

SET F (Grade Increment 2080)

46. The surveying work that involves the determination of natural features is known as
 - a. City surveying
 - b. Location surveying
 - c. Cadastral surveying
 - d. Topographical surveying
47. The sag correction is always
 - a. zero
 - b. may be additive or subtractive
 - c. subtractive
 - d. additive
48. Find the R.F. of 1 cm = 5 m.
 - a. 1/5
 - b. 1/50
 - c. 1/500
 - d. 1/5000
49. Convert 1 feet into inches.
 - a. 12 inch
 - b. 10 inch
 - c. 8 inch
 - d. 6 inch
50. What is the first stage of chain survey?
 - a. Reconnaissance
 - b. Fixing station
 - c. Taking offsets
 - d. Referencing
51. In which type of survey, local attraction occurs?
 - a. Chain survey
 - b. Level survey
 - c. Compass survey
 - d. Plane table survey
52. In compass survey, inaccurate leveling of compass is related to
 - a. natural error
 - b. personal error
 - c. instrumental error
 - d. systematic error
53. If the R.L. of B.M. is 100m, B.S. is 1.52m and F.S. is 3.285m, then the R.L. of forward station is
 - a. 98.235m
 - b. 101.755m
 - c. 101.525m
 - d. 105.25m
54. In levelling, the line of sight is also called
 - a. Line of axis
 - b. Line of collimation
 - c. Line of bubble tube
 - d. Line of object

SHORT AND LONG ANSWER QUESTIONS

Chapter 1 | Introduction [5 Marks]

1. Define surveying. Explain principles of surveying. [R/GI-2080]
2. Write any three differences between plane surveying and geodetic surveying. [R-2080]
3. Define full size scale, reducing scale, and enlarging scale
4. Write short notes on plain scale, diagonal scale, vernier scale and scale of chords.

Chapter 2 | Measurement of Distance [5 Marks]

5. List all the accessories required for Distance Measurements.
6. Explain types of chain and tape in brief. [R-2080]
7. Define Ranging. Explain its types.
8. Explain Horizontal Distance Measurement on Plain Ground
9. Explain Horizontal Distance Measurement on Sloping Ground [GI 2080]
10. Explain Chain and Tape corrections in brief.

Chapter 3 | Reliability of Survey [5 Marks]

11. Define Accuracy. Why is it required in surveying? [R-2080]
12. Define Error. Explain types of error in surveying. [R-2080]
13. Define Precision. Why is it required in surveying? [GI 2080]

Chapter 4 | Chain Survey [12 Marks]

14. Define chain surveying. Explain principles of chain surveying. [R/GI-2080]
15. Enlist suitability and unsuitability of chain surveying. [R-2080]
16. Explain well - conditioned triangles and ill – conditioned triangles.
Which triangle is used in chain surveying? Why?
17. Explain survey stations and survey lines in brief.

18. Explain procedure of reconnaissance in chain survey.
19. Define offsets and explain its types. [R/GI-2080]
20. Define field book and explain its types. [GI 2080]
21. Explain procedure of conducting chain survey.
22. Explain procedure of plotting a chain survey.

Chapter 5 | Compass Survey [11 Marks]

23. Define Compass surveying. Explain principles of compass surveying.
24. Define Traversing. Explain the types of Traverses.
25. Differentiate between Prismatic and Surveyors Compass. [R-2080]
26. Define Meridian. Explain its types. [GI 2080]
27. Define Magnetic Declination. How can you tell if the declination is eastern or western? [GI 2080]
28. Define Bearings. Explain its types.
29. Write Short notes on Whole Circle Bearing System and Quadrantal Bearing System.
30. Define Fore Bearing and Back Bearing.
31. Define Local Attraction. Explain ways to eliminate local attraction.

Chapter 6 | Levelling [12 Marks]

32. Define the terms use in leveling- Leveling, Datum, Benchmark (Permanent, Temporary, Arbitrary), Reduce level, line of collimation, back sight, intermediate sight, change point or turning point. [R-2080]
33. List types of levels. Explain Auto Level in brief with a neat sketch.
34. Why adjustment of level is required? Explain Temporary adjustment of level. [R-2080]
35. Write any four differences between Rise Fall Method and Height of instrument method
36. Explain uses of levelling.
37. Explain Two peg test

38. Write a short note on Fly levelling.
39. Explain Reciprocal levelling
40. Explain Errors in levelling.

NUMERICALS

Chapter 2 | Measurement of Distance

1. A line was measured with a steel tape which was exactly 30 m at 18°C and a pull of 50 N and the measured length was 459.242 m. Temperature during measurement was 28°C and the pull applied was 100 N. The tape was uniformly supported during the measurement. Find the true length of the line if the cross-sectional area of the tape was 0.02 cm², the coefficient of expansion per °C = 0.0000117 and the modulus of elasticity = 21×10^6 N per cm².

2. A steel tape was exactly 30m long at 22° C when supported throughout its length under a pull of 50 N. A line was measured with the tape under a pull of 80N and found to be 605m. The mean temperature during the measurement is 30° C. Assume the tape to be supported at every 30m. Compute the true length of the line given that cross-sectional area of the tape is 0.04 cm². The weight of tape is 9.24 N, the coefficient of the expansion is 0.0000117 per °C and the modulus of elasticity is 2.1×10^7 N/cm².

Chapter 5 | Compass Survey

3. Following are the bearings taken in a closed compass traverse.

Line	F.B.	B.B.
AB	142°30'	322°30'
BC	223°15'	44°15'
CD	287°00'	107°15'
DE	12°45'	193°15'
EA	60°00'	239°00'

Compute the interior angles and correct them for observational errors.

4. Convert the following bearing into back bearing. [GI-2080]

- | | |
|---------------------------------|---------------------------------|
| a. F.B. of line PQ = 139°10' | b. F.B. of line ST = N 35°20' E |
| c. F.B. of line QR = N 50°30' W | d. F.B. of line TU = S 20°30' E |
| e. F.B. of line RS = 220°30' | |

5. Fore bearing of lines PQ, QR, RS, ST and TP are 35°30', 110°15', 210°30', 290°45' and 300°45' respectively. Find the interior angles <P, <Q, <R, <S and <T. [R-2080]

Chapter 6 | Levelling

6. The following consecutive readings were taken with a level on continuously sloping ground at a common interval of 20 m using a 4m levelling staff. The first station has an elevation of 164.657 m. Rule out a page of level book and enter the readings. Calculate the reduced levels of the points by rise and fall method, and the gradient of the line joining the first and last points. 0.420, 1.115, 2.265, 2.900, 3.615, 0.535, 1.470, 2.815, 3.505, 4.445, 0.605, 1.925, 2.885

7. A surveyor observed following data during leveling:

0.48, 0.56, 0.78, 1.91, 1.97, 2.35, 1.75, 0.35, 0.69, 1.24 and 0.98 m. The position of the instrument was changed after third, seventh and ninth reading. By preparing field book, calculate R.L. of all points. Assuming the R.L. of first point as 100 m and check the results. [Use both RF and HI method while practising] [GI-2080]

8. Also see similar questions from copy.